SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

SCIENTIFIC AND STATISTICAL COMMITTEE

Crowne Plaza
North Charleston, South Carolina

October 15-17, 2019

Summary Minutes

Scientific and Statistical Committee Members

Dr. George Sedberry, Chair	Dr. Robert Ahrens, Vice Chair
Dr. Jeffrey Buckel	Dr. Scott Crosson
Dr. Churchill Grimes	Dr. Eric Johnson
Anne Lange	Dr. Wilson Laney
Dr. Yan Li	Dr. Genny Nesslage
Dr. Marcel Reichert	Dr. Amy Schueller
Dr. Fred Serchuk	Dr. Alexei Sharov

Council Members

Jessica McCawley	Mel Bell
Stephen Poland	

Council Staff

Gregg Waugh	John Carmichael
Dr. Brian Cheuvront	Myra Brouwer
Julia Byrd	Dr. Chip Collier
Cierra Graham	Dr. Mike Errigo
John Hadley	Cameron Rhodes
Kathleen Howington	

Other Observers and Participants

Dr. Jared Flowers	Erika Burgess

Other observers and participants attached

Attachment 1: SSC April 2020 Meeting

The Scientific and Statistical Committee of the South Atlantic Fishery Management Council convened at the Crowne Plaza, North Charleston, South Carolina, on Tuesday, October 15, 2019, and was called to order by Dr. George Sedberry.

INTRODUCTION

DR. SEDBERRY: Welcome, everybody, to the fall meeting of the South Atlantic Council SSC. My name is George Sedberry, and I am Chair of the SSC, and to my left here is Rob Ahrens, Vice Chair.

DR. AHRENS: Rob Ahrens, Vice Chair.

DR. SEDBERRY: Just to remind everybody, we are on the record, and this meeting is being recorded, and there will be verbatim minutes available, and so just keep that in mind. Before we do our usual around-the-table introductions, I believe the Executive Director of the Council, Gregg Waugh, had a few words to say.

MR. WAUGH: Thank you, George, and good afternoon, everybody. I just wanted to -- For those of you who don't know, I am retiring at the end of the year, and the council has selected John Carmichael as our next Executive Director, and so, on December 13th, at 5:01 p.m., I will switch off my phone, but I just wanted to say thank you to you all for your time, and, looking around, I have worked with most of you for a little, and some are newer, and then there's a couple of old-timers on here.

I was joking with our System Management Plan group last week about when we first started talking about MPAs, and George was on the plan development team, and, I think, Church, you were on that group as well, and we came up with this brilliant idea, and probably Bohnsack was the one who planted the seed to come up with MPAs, and we came up with a map that showed 20 percent of the area off of each state, just as an example, to show people.

We presented that to the council, and we about got run out of the room. We were instructed -- I don't think there was a motion, but pretty close to it, to never let map see the light of day, and I was talking with George, and he said he uses that in his presentation on what not to do when you're talking about MPAs, but, in all seriousness, thanks to you all. I know that you take out a lot of time out of your schedules, and we appreciate it. The council relies on your work, and, Church, I figured -- You know, we've worked together for a long time, and when your kid shows up as our NOAA GC, I think it's time for me to head out the door. Thanks a lot, and I appreciate it, and please keep up the good work. The council needs the help and your advice. Thank you. *(Applause)*

DR. SEDBERRY: On behalf of the SSC, Gregg, thank you. We appreciate the support that you have given to the SSC and to science-driven management in general, and so we really appreciate the work that you have done with this council to help get the science out there and help support science and incorporate science into all the management decisions, and so thank you for your service as well.

Moving on, I'm sure you all have seen in the emails that Carolyn Belcher has resigned from the SSC after eighteen years, and so we're sad to see her go, but we do have her replacement, Dr. Jared Flowers, who is at the table and will introduce himself shortly, and then Luiz Barbieri has also resigned. As you know, he's a pretty busy person, and he was on two SSCs, and so he has resigned from the South Atlantic SSC, and he will be replaced by Dustin Addis, and I'm not sure that I am pronouncing his name correctly, who is not at this meeting, but will be replacing Luiz as the Florida representative on the SSC.

As you also recall, Wilson Laney joined us prior to our MRIP workshop, and he was introduced at that workshop, but, in case you weren't there for that, Wilson is a new member to the SSC as well, and so let's go around the room, starting with Wilson, and introduce ourselves, your name and your affiliation.

DR. LANEY: Thank you, Mr. Chairman. My name is Wilson Laney, former U.S. Fish and Wildlife Service, and, after thirty-eight years, I decided to step down, and so I'm now at the North Carolina State University Department of Applied Ecology.

DR. FLOWERS: I am Jared Flowers, and I'm the Research and Surveys Unit Lead for the Georgia Department of Natural Resources, Coastal Resources Division.

MS. LANGE: Anne Lange, SSC.

DR. SERCHUK: Fred Serchuk, SSC.

DR. SHAROV: Alexei Sharov, Maryland Department of Natural Resources.

DR. NESSLAGE: Genny Nesslage, University of Maryland, Center for Environmental Science.

DR. REICHERT: Marcel Reichert, South Carolina Department of Natural Resources.

DR. AHRENS: Rob Ahrens, University of Florida.

DR. SEDBERRY: George Sedberry, SSC.

DR. ERRIGO: Mike Errigo, South Atlantic Council staff.

DR. GRIMES: Churchill Grimes, SSC.

DR. BUCKEL: Jeff Buckel, North Carolina State University.

DR. SCHUELLER: Amy Schueller, National Marine Fisheries Service.

DR. CROSSON: Scott Crosson, National Marine Fisheries Service in Miami.

DR. JOHNSON: Eric Johnson, University of North Florida.

DR. SEDBERRY: Thank you, SSC. In addition to the SSC members who are here, I think we have a couple that are online. Can we maybe have them introduce themselves online?

DR. ERRIGO: None of the SSC members who aren't here today are online right now. They said they may be able to hop online intermittently, but the reason why they couldn't make it, for most of them, was they had in class, and so they are probably teaching class.

DR. SEDBERRY: Okay. Thanks, Mike. In addition to the SSC, we have Steve Poland, who is the SSC liaison with the South Atlantic Council, and I believe we have the Chair of the Council, Jessica McCawley, and Vice Chair Mel Bell. Then we have various other celebrities around the room, which you can introduce yourselves to later.

The first item on the agenda, as usual, is Public Comment, and so, at the SSC meeting, as you will recall, we take public comment -- I got ahead of myself. The first thing is to approve the agenda for this meeting, and the agenda was sent out with the briefing book. Does anybody have any additions or omissions or corrections to the agenda?

DR. ERRIGO: I just have one thing to add under Other Business. Julia Byrd would like to come up and talk about the FISHstory project, very briefly, and ask for volunteers for one of the projects under that.

DR. SEDBERRY: Would that be right now?

DR. ERRIGO: Under Other Business.

DR. SEDBERRY: Okay. We will remember to do that under Other Business at the end. The other thing we need to do is approve the minutes of our last SSC meeting in May and then the MRIP Workshop that we had in August, and so the verbatim minutes for those were sent out to the SSC, and they were also in the briefing book. Does anybody have any corrections to make to the minutes from either our last meeting or the MRIP workshop?

DR. SCHUELLER: I just have one correction, and that's I'm not listed as one of the SSC members that attended the MRIP workshop in the document.

PUBLIC COMMENT

DR. SEDBERRY: Okay. We will make that correction. Thank you. Any other changes to the minutes from either meeting? Then both the agenda for this meeting and the minutes from the two previous meetings are approved, with the one correction to the MRIP workshop, to include Amy Schueller as an SSC participant.

Now it is time for public comment, and so the SSC takes public comment at the beginning of the meeting, at the end of the meeting, and after the presentation for each agenda item, to give the public a chance to comment on the content of that presentation and the agenda item itself, and so, at this time, is there any public comment from any members of the public that would like to come before the SSC and present anything? I do not see any, and so we have no public comment at this time.

ABC RECOMMENDATIONS FOR UNASSESSED STOCKS

Now I think we're ready for the first official agenda item, which is ABC Recommendations for Unassessed Stocks, and, also, as you recall, as is our general procedure, I assign SSC members to take notes and particularly pay particular attention to any consensus statements or recommendations or conclusions that the SSC makes, and we need to present a report to the South Atlantic Council on our proceedings here, both a written report and then a report at their December meeting, and so I have asked Anne, Genny, and Fred Serchuk to take notes on this agenda item regarding ABC recommendations for unassessed stocks.

There were two attachments associated with this agenda item, Attachment 3 and 4, that were sent out, again, with the briefing book, and, as you will recall also from our MRIP discussions and the workshop, the MRIP results show a large difference in the amount of recreational effort, and therefore recreational catch, for almost all species, and so this necessitated a recalculation of all ABCs to match the new survey output.

The SSC had an ABC workgroup that has gone through all of the unassessed stocks and given preliminary recommendations for the full SSC to consider at this meeting, and the members of that workgroup were Marcel, Jeff, Eric, and Scott, I believe. I guess what we have to do here is we have a couple of action items. First, of course, we will have public comment on this particular agenda item, if there is any public comment on ABC recommendations, and then we'll take up the action item, and so I'm going to again call for public comment on the agenda item dealing with ABC recommendations. Okay. No public comment. We do not have a presentation on this, and is that right, Mike? It's just the two attachments?

DR. ERRIGO: I am going to walk through the Excel spreadsheet.

DR. SEDBERRY: Okay. You're going to do that now, right?

DR. ERRIGO: Yes, and I don't know, Scott, if you wanted to walk everyone through what happened, and then I will go through the Excel spreadsheet?

DR. CROSSON: I guess that Carolyn was originally supposed to be the chair of this group, or at least a member of it, and so she has left the SSC, and so had instead -- I guess we were going to have a series of webinars, but we ended up only needing one marathon four-hour webinar that we did a month or so ago, and so we went through tab-by-tab-by-tab-by-tab for almost four hours, and I'm going to keep saying for almost four hours, if you all think about arguing too much, but we went through all of this stuff, and we looked at the data, and we talked about some different species identification issues that might arise, and we talked about it in the context of the management in the past and different factors that might contribute to these things, and so we came up with our comments, and we commented, I think, on every species inside the tabs. I guess what we're going to do today, Mike, is we're going to go through those, and hopefully the SSC will approve them without questioning it.

DR. ERRIGO: I was asked to do a couple of things before proceeding right into this, and one was to remind everyone what Monroe County looks like and to tell everyone exactly how unassessed species ABCs and landings and tracking works. Here is Monroe County, and it goes up a little bit into the Gulf, the western side of Florida, and this is mostly Everglades National Park over here,

and here's the Keys here, and, technically, the boundary between the South Atlantic and the Gulf is -- This is the South Atlantic on the southern side of the Keys, and then up here is the Gulf.

How all of the unassessed species work is we do not include landings from any of the Monroe County, and that includes the Keys, and so the ABCs -- For the recreational sector, and that's for the MRIP portion of the recreational sector. For the headboat, we do include it, and for the commercial we do.

DR. SEDBERRY: Mike, that's for all species, or is this just the dolphin wahoo part that we're talking about?

DR. ERRIGO: This is for all unassessed species. That is how that works, and what happens is, for the private and charter boat, it just starts from Miami-Dade and goes up, and so that's how we create the ABCs, and the landings start from there, and that's how we track them, and so some background context for the discussion with dolphin and wahoo.

DR. REICHERT: Mike, can you remind us what happens with those catches, or how are those catches then accounted for in our recommendations, in Monroe County, because I think, at some point, they have to be accounted for, correct?

DR. ERRIGO: For snapper grouper species, almost all of those are also managed in the Gulf, and so those landings go to the Gulf, and so they are just included in the Gulf ABCs, and they track the landings in the Gulf for all of Monroe County, including the South Atlantic side of the Keys, and so they just take all of them. That's what they do for all the species.

However, as we'll talk about with dolphin and wahoo, the Gulf does not manage dolphin and wahoo, and so those landings are just disappearing, and there is a significant amount of them, and so that's why the council has asked the SSC to consider adding in Monroe County landings of dolphin and wahoo, even though it's unassessed, into the South Atlantic, because there is a significant amount of landings that is just going away. We can just do that first, since we're talking about it.

DR. SHAROV: A quick clarification question, and forgive me, but, after two years, I guess I still don't know everything. The decision was made to attribute all the landings from the Keys into the Gulf accounting system, and is it just based on the difficulty of splitting the origin of the catch? Could you enlighten us on this? Thanks, Mike.

DR. ERRIGO: That comes from how the MRIP survey is designed. The MRIP survey splits Florida into pieces, and the lower part of Florida -- So I think there is four sections of Florida, the northeastern, the northwestern, the southeastern, and the southwestern portions. The southern part of Florida, the east and west portions, basically splits down the middle, and so that splits between Monroe County and Miami-Dade, and so that's why it splits there, and Monroe County goes into the Gulf. Even though the South Atlantic gets one-half of the Keys, the MRIP survey traditionally couldn't just be split like, oh, here, we'll figure out which portion of the landings came from this side of the Keys, and we'll give those to the South Atlantic. Originally, the way the survey was designed, there wasn't any way to do that.

The Science Center had eventually come up with a way of kind of doing that like for SEDAR assessments, but it was ad hoc, and it's only done on a species-by-species basis for SEDARs. When they track landings, often times the species that have Monroe County added in for the South Atlantic are species where the Gulf portion of the landings in Monroe County are trivial, or non-existent, like blueline tilefish.

DR. SHAROV: So the intercepts, or the interviewers, are not asking where the fish were actually harvested, in the Gulf versus Atlantic, and they are just simply interested in whether it's state waters or beyond state waters?

DR. ERRIGO: Yes, and the way we identify where a fish comes from, or where it gets attributed to, is by where it's landed and not where it's actually caught, although I think, moving forward, there may be ways to split Monroe County a little better, but, until we get there, this is how we're doing it.

DR. SHAROV: Well, there is a precedent for the MRIP, like in the case of, for example, inland areas, because they identify it specifically, like Chesapeake Bay or Delaware Bay, et cetera, and you would think that it would make sense to actually do a separation here as well, hopefully in the future. Thanks, Mike.

DR. ERRIGO: You're very welcome. Since we're talking about this Monroe County issue, I figured we'll just hit dolphin and wahoo first. These are the landings for dolphin. The red are the new calibrated MRIP numbers, and the blue are the old numbers, and the green are the landings with Monroe County added in.

Also, a little more background, because a bunch of you weren't on the SSC when we did the ABCs the last time, but, when ORCS was developed, dolphin and wahoo were considered ORCS species, and they went through the ORCS methodology and came up with an ABC. However, the council did not add the ORCS methodology to the dolphin and wahoo plan, and so it never happened, and so they still are using the decision-tree-based ABCs for dolphin and wahoo.

Until the new ABC control rule amendment goes through, there is no ORCS method for dolphin and wahoo. The SSC can make an ABC recommendation that deviates from the control rule that's in place for dolphin and wahoo with justification, if they want to, but, just so you guys know, that's the deal with dolphin and wahoo. It's a little confusing, but -- That's why there is a new ABC, and then there's a new ORCS ABC, and there is a third-highest and all that jazz. The years for dolphin and wahoo were also different than most of the other years that we used for the ORCS species.

DR. CROSSON: So we might not want to tackle this one first.

DR. REICHERT: I am not sure -- I mean, the years, that was the block of years that we used to set our ABC, for those who were not involved in the development of the ORCS, because that may be a little confusing, if people don't quite know what that means.

DR. ERRIGO: Yes. For the decision tree and for ORCS, each species was given a reference period of years, and so 1991, or 1989 to 1990 or 1991 or whatever, some block of years, and then trying to -- It was 1991 to 2008, and then we truncated it to 2007, and then what we tried to do is

the SSC tried to pick a time period where effort was relatively stable, and that time period is when -- You used those landings to set the ABC, and so, for the decision tree, it was the third-highest landings in that time period. For ORCS, you take the highest landings, and you multiply it by the scalar, and then you multiply that by the risk tolerance scalar to get the ABC, and so that's what the reference period refers to. It's 1999 to 2008 for all the species, and then we took 2008 off, and so it's 1999 to 2007 for all species now.

DR. SEDBERRY: Mike, since ORCS was not used the last time, the old ABC is the third-highest without Monroe, or it was whatever was in the decision tree?

DR. ERRIGO: Well, that was what was in the decision tree, yes. The years that the SSC had said they wanted to use for dolphin and wahoo was 1994 to 1997 for dolphin, and I don't know if -- I have wahoo, and I don't know if they are different or not, but it was 1994 to 1997. However, the trend in the landings is different now than it was before, and so that -- You may want to reconsider. Originally, the landings trend decreased, starting from 2002 or so, all the way to the end of the time series. Now, it's basically flat across that time period.

DR. LANEY: So that's because of the addition of the Monroe County landings, Mike?

DR. ERRIGO: No. The trend became flat when just the -- It's just from the calibration of the MRIP numbers. Adding the Monroe County scaled it up, a lot more so with the earlier years, but it just scaled the whole time series up.

DR. SEDBERRY: Mike, should we take each action item for each of these stocks and discuss them?

DR. ERRIGO: Pretty much. Each one of the species has notes in it from the ABC Workgroup. For this one, it said that there were no concerning trends in the new recreational data. This species looks like it can sustain the current landings long-term, and there may be concerns about decreasing CPUE. Then clarify how Monroe County landings are divided and recommend including Monroe County landings in the ABC and tracking it.

DR. SEDBERRY: So the workgroup has recommended that we include Monroe County landings in the ABC and tracking it, and is there any reason why -- Do any SSC members see any reason why that should not be done?

DR. SHAROV: Do we have the landings from Monroe County covering your reference period for which the ABCs were calculated using the ORCS method?

DR. ERRIGO: Yes, and I have them going all the way back to the beginning of the time series, yes.

DR. SHAROV: So what is proposed is the methodology is the same, and what is changing is only adding in an additional source of the catch, and then we essentially have a new plot of the newly-estimated total recreational harvest that includes Monroe County and the interpretation of the workgroup about the trends, correct?

DR. ERRIGO: Yes.

DR. SHAROV: So then, if the SSC has agreed to the methodology, I don't see a reason why this should not be appropriate.

DR. SEDBERRY: Thank you, Alexei. Before I call on you Wilson, I have been asked to remind people to please mute your mics on your laptops, if you happen to have them on or are listening into the webinar, because we're picking up feedback from someplace. Wilson, did you have a question or a comment?

DR. LANEY: Yes, I did, I guess I will direct it to Scott and ask what the discussions were at the workgroup about the new data and especially about the concerns over CPUE, because, you know, we've gotten an earful at the council, from the guys from the Keys especially, who are concerned about their observations relative to the lack of younger dolphin, especially.

DR. CROSSON: That's it, in a nutshell. That's all we've heard is anecdotal stuff, and you don't assess mahi, because it's almost an annual crop, and so we've heard that. All it means to us is that maybe you might want to be a little precautionary on this. Whether that council chooses to do that, by making a bigger buffer between the ABC and the ACL or whether we should attack it here, I guess is -- We should probably include it here, I would think. We should consider that there is some biological concerns, but, again, keeping in mind that it's a species with a very short lifespan, and it's pelagic and all the stuff that goes along with that.

DR. ERRIGO: I did look into that a little bit, and, yes, in the Keys, people are not seeing dolphin like they used to, although temperature patterns are different in the Keys now than they used to be, and so there is the possibility that the dolphin are there, but in different locations, further offshore, let's say, because, in North Carolina, from what we're hearing, dolphin is doing very well, and you can correct me if I'm wrong.

DR. CROSSON: I mean, I've heard it even going further north than that as well, and getting up into the Mid-Atlantic, that there are a lot more dolphin.

DR. ERRIGO: Yes. Up into the Mid-Atlantic, they are actually landing dolphin.

MR. POLAND: I am not going to make a definitive statement that they're doing well or not well, but I will just say that there's really no trends in landings up off of the Carolinas to really speak of.

DR. SEDBERRY: Thanks, Steve.

DR. BUCKEL: Just to -- I was on the ABC webinar, and one of the things that I brought up for that discussion on dolphin was there is a recent paper by Patrick Lynch and Kyle Shertzer that came out of a couple of years ago, and they analyzed observer data from longlines in the north Atlantic, and for multiple pelagic species, and dolphinfish was one of those, and so, for the last twenty years, there's been a decline in the catch per unit effort of commercial longline. They did a decent job, a very good job, a very thorough job, of taking into account all the potential covariates, like water temperature, that might affect those catch rates, and so that's one thing that concerns me, because of that very careful analysis, and it is fishery-dependent data, but they did

try to control for the potential confounding variables there. Then, when I look at this plot, this is landings, and so, if you look at the -- This is private and charter, I think.

DR. ERRIGO: This is total landings, but --

DR. BUCKEL: Total landings from all modes?

DR. ERRIGO: For all modes, yes.

DR. BUCKEL: So probably the bulk is private and charter.

DR. ERRIGO: Yes, and the bulk is recreational. You couldn't see the commercial landings on this graph.

DR. BUCKEL: Yes, and so I just did a quick query for private boats, and, from 2000 back, it's like two to 2.5 million trips, but, for 2000 forward, it's 3.5 to 4.5 million trips, and so the effort has increased during this time series, but we're seeing this kind of flat landings, and that's always a cause for concern, and so it seems to be, from the commercial longline paper by Lynch et al., and then just looking at the landings and thinking about the effort, there may be something going on with catch per unit effort in the marine recreational, but so definitely a research recommendation to look into this further and for us to have some precaution.

DR. SEDBERRY: Thank you, Jeff. That recommendation, make sure we get that in the notes.

DR. SERCHUK: I just had a point of clarification or concern, Chairman. I know we're going to the third point of action here, but have we actually discussed the first point? That's where my confusion is. I mean, we have two issues going on here for some of these species. One is we have the new MRIP data coming in, and I don't know whether the group has looked at that and were there any issues there, and then we have the Monroe County issue.

I am little bit concerned that we're addressing the third issue without going to the first issue, because I don't know whether there are any issues related to just using the MRIP data and whether there are any changes in our perception or it's just a complete scaling. Maybe you said this, Mike, already, but I am concerned that we should take it step-by-step here, Chair, because I'm a little bit betwixt and between about taking two issues at once for wahoo and dolphin without seeing first what the new MRIP data are doing to how we would do the ORCS derivation for those species that are not involved with Monroe County, and do I make myself clear, Chair?

DR. SEDBERRY: Yes, I understand that, and I went to the Monroe County issue first because the workgroup had a definite recommendation there, and I thought the SSC could quickly agree to that, but I can see that that is more complex than I thought it would be, and so you're right that we have these action items in order, and the MRIP data is -- The first two action items are more broadly applied to all the other species that we have talk about too, and so it might actually behoove us to take care of those first, and then we won't have to deal with them quite as much when we get to the other stocks as well.

DR. ERRIGO: I am re-reading Action Point Number 1, and I'm realizing that my wording was not very distinct. What I mean by "time series" was the "reference period". Is the reference period

for calculating ABCs for unassessed stocks still appropriate? The MRIP workshop determined that the time series of data, the new MRIP numbers, is appropriate for calculating ABCs, and that -- We beat that dead horse, and so it's is the reference period for calculating ABCs for unassessed stocks still appropriate, and that's what that is saying.

DR. BUCKEL: Mike, in the past, we have based that on if there was a period of fairly constant effort, correct?

DR. ERRIGO: I believe so, although that was done before I started working at the council, but, yes, I believe that's how that reference period was decided upon, was a period of stable effort.

DR. BUCKEL: That's my recollection, and so do you have a plot of effort that we could -- Because that would help with that first bullet.

DR. ERRIGO: I do not, but I conjure one up, I think, pretty quickly.

MS. LANGE: I am not sure if we used effort or landings. I thought, because they were ORCS species, or what we're calling ORCS species now, but they were data-limited species, and we only had minimal catch information about them and not effort, I don't believe, and so my recollection -- I think, John, you were there, and I think we were just looking at the time series, as clean of a time series as possible, of the landings and making a determination where it looked like there was a period for each stock of relatively consistent landings. Then, once that was done, looking at an overlap of all the species that were included, to say, okay, this year period is consistent amongst the majority of those stocks.

MR. CARMICHAEL: The base periods that you have was landings, and it was looking at that, and it was also considering things like reporting changes and stuff that had happened and what gave you a fairly reasonable history. In some stocks, you used some different years, because they already had allocations applied, and black sea bass comes to mind for one, and I think Spanish mackerel was another.

For dolphin, you got into a little bit different time series, and there was some discussion about some trends, I think near the end of the time series, and some stuff that had happened, and you picked a slightly different year, but, for the most part, for the stocks that are the -- Actually, they are the unreliable catch species, because these are the unassessed stocks to which the SSC applied its decision tree alternative, and you picked a set of baseline years.

Now, I think the ORCS used a very similar set of baseline years, but those go back to our original ACL amendment and putting that stuff in, and you considered a lot of things, like trends in the data, as I mentioned, as well as then you looked within that period to decide if you saw anything that gave you concern about the time series, and so it was kind of, I guess, ancillary things that affected this period where you thought it was potentially representative of the fishery's natural tendency, largely unencumbered by a lot of regulations, and then you evaluated the landings within that period, to see if you thought there was any indication that those average landings had been potentially detrimental to the stock. I don't recall that we really got into effort, but we may have looked into effort for some things like dolphin, where we were coming up with a different time period, and I think that's one of the exceptions where you dug a little deeper.

DR. REICHERT: I think where the effort -- Because we did consider effort, because that was the reason why we dropped the 2008 year, because of the recession, and so we may not have looked at very species-specific effort, but we did look at socioeconomic factors and some other issues that may have affected effort, and so I think that effort was something that we considered in selecting that period.

DR. ERRIGO: So can we make any decisions on dolphin at this time, or would you like me to move on and come back?

DR. REICHERT: The question I would ask, in terms of our reference time series, is is there anything that has changed between the two methods, in terms of landings and effort, that causes concern, and I think that's, briefly, what we discussed at the webinar, and we couldn't come up with anything that may make us decide to choose a different time period.

DR. SEDBERRY: The workgroup's recommendation is to retain the time series that is --

DR. REICHERT: Yes, unless there is some -- Unless anyone has information that may make us reconsider that, and it may be the new estimates point towards something that may be cause for concern.

DR. LANEY: Well, I would just go back to what Jeff said earlier about biological reasons for concern, perhaps, but the other thing that's fresh in my head, and some of the other folks in the room were at the same workshop, is we just go through doing a climate vulnerability assessment, and dolphin was one of the species that we assessed, and that report is not finished yet. It's not ready for public consumption, but I think we all need to keep in mind that, for the whole South Atlantic, habitat conditions are changing, and the temperatures are certainly going up, and the pH is going up.

Now, if I remember, and Lauren can help me out on this one, because she's out diet guru back there, but I don't think that dolphin were particularly dependent on species that are adversely affected by the decreasing pH, and so, from a prey standpoint, they're probably okay, but we did have a good bit of discussion about sargassum and how sargassum might be affected. Right now, it seems like sargassum abundance, if anything, is going up, and so, to the extent that dolphin are tightly linked to sargassum, that could be a benefit, if sargassum responds positively to the warming temperatures out there, and so you would expect to possibly see an increase, but then you have to balance that against the temperature change.

Some of us are familiar with the term "critical thermal maximum", and yours truly did his master's on that, many, many, many moons ago, and so you've got a species that has a very growth rate and a very high metabolism, but, also, where is it -- I don't know that anybody has ever done critical thermal maximum calculations or experiments for dolphin, and so how close is it to its upper limit, and is that why we're possibly seeing a shift in effort from the southern part of the range off the South Atlantic up into the northern part of the -- Not effort, but CPUE, and so I don't know. I haven't seen the paper that Jeff referenced, and so I think it's worth taking a look at that, but I guess precaution would seem to be a good byword here.

DR. CROSSON: I am not familiar with term, but, unless I'm mistaken, doesn't the South Atlantic Council manage dolphin all the way up the east coast to Maine? So this is kind of a moot point,

unless they're leaving U.S. waters into Canada or something like that. I mean, this is where the issue -- Maybe the council might want to do something with localized depletion in the Keys, but I don't think it's an issue that the SSC has to worry about, since we're not doing an ABC for the South Atlantic region geographically, and we're doing it for the entire east coast.

DR. SEDBERRY: That's a very good point. Thank you.

DR. SHAROV: I think that there is certainly a value in all additional information, whether it's the catch per effort or published or unpublished studies that report on certain changes related to either absolute relative abundance or survival estimates, et cetera. I think it's important, but, with respect to the methodology of calculating the ABC for this and other species, if we are concerned about this potential effect, in which I guess the implication is that the population has declined, and therefore that adjustments should be made, at the moment, as the ORCS methodology is being used here, I think it remains a valid methodology.

If not, we have to do those changes, and we have to -- If we have evidence that this is an insufficient methodology that will be missing something, important dynamics, in the case of dolphin and many other species, then we should be reverting to the discussion of modifying the methodology. As I understand, we do not.

With respect to the reference period, I didn't hear, so far, that somebody had said that the reference period should be changed because of whatever the additional information, either the new MRIP data or the Monroe County data suggests that the reference period should be either shifted to the left or to the right or expanded, because of certain trends, and so I am looking at this strictly from the perspective of following the methodology, and, if we are concerned about what Wilson talked about and some others mentioned, the declining CPUEs, there has to be a way of formally including into the process of ABC calculation -- I don't know, but changing the estimated risk for overexploitation, and I think that's the only way that we could do it in this formula that we're using, but, at this point, I personally feel that the method is applicable, but the concerns could be just simply mentioned in the report, that we state that this methodology -- Maybe we would recommend watching the trends for the CPUE and the catch as well.

DR. SEDBERRY: Thank you, Alexei. I agree with you, and I just want to clarify one thing that I think you -- I think the ORCS approach was what the SSC considered, but what was ultimately used was the decision tree.

DR. ERRIGO: This is from the MRIP website, and it's angler trips, private boat angler trips, for a bunch of states, Connecticut, and this is Delaware, and Florida, and this one is Georgia. This one is Maine, Maryland, Massachusetts. They all are going up until 2010, or 2011, and they level off, and then they actually start to go back down again at the very end. Sorry that it's cut off, but that's what happens. They level off up here, and then they -- That's what the effort trends look like.

DR. REICHERT: I would note that the scales are vastly different, by the way.

DR. ERRIGO: Yes, the actual number of angler trips is very different, but the trends are, for the most part are going up, up until 2010 or 2012.

DR. SEDBERRY: So this goes back to Jeff's point about the effort increasing while the catches are flat or decreasing, which is cause for concern.

DR. BUCKEL: Yes, and one of the issues with doing this is that's all Marine Recreational effort, and so knowing the effort that was targeting dolphinfish -- We don't know that, and so it's just to make that point.

DR. SEDBERRY: Yes, that's a good point. There's probably not a lot of effort in Maine targeting dolphinfish, in spite of climate change.

DR. SCHUELLER: I don't have anything to add, other than I have no idea where we're at. It seems to me that we need a little bit more structure with this discussion than we're having.

DR. ERRIGO: The ABC Workgroup made recommendations to use the new data and the methodology that was used the last time to calculate the ABC. Does the SSC agree with that?

DR. SEDBERRY: I think Alexei summarized this just a short while ago in his comments, and I haven't heard any disagreement with that. I haven't heard any objection to the time series used for calculating ABCs for the dolphin stock, and it's still appropriate, given the changes in the catch data, and so the SSC is not recommending any modification to that.

MS. LANGE: Can we just go back to the beginning of the discussion and forget dolphin wahoo, because, again, I think, especially people who weren't involved in the original discussions of setting the -- Using the time period averages or high three or median, depending on the stock -- Each of the other stocks is a very specific question, and we have now used the new MRIP data, and we've put it on the plot, and we've got the old data plotted that shows the time period and what the average was and the line that was used, the black line or whatever it was, and now this is the data that has been now redone for MRIP, and the trends are pretty much the same for each of the species. This species, the trend looks pretty much the same as it did before, but it's just scaled. Is there any reason not to use the same time period?

The next species, you've got spadefish, and you've got bar jack. The time series are very similar between the old numbers and the new MRIP data, and so the methodology -- There is no reason to change it, and I think that would be easier than trying to keep focusing on dolphin wahoo that has a whole separate issue going on. Everyone seems to be going back to the Monroe County, or looking at a different area, rather than just the overall estimated numbers. I may have just confused things even more.

DR. SEDBERRY: No, I like what you just said, and that's why I thought maybe if we could just knock that Monroe County thing off and just settle that, that we agree with what the workgroup recommended and it's fine and then let's address the other issues as they apply to more or all of the stocks, and so, if we can agree, as an SSC, with the workgroup's recommendation, which is up there in the little box. It's recommend including Monroe County landings in the ABC and tracking. Is there any objection to that? Can the SSC agree with that recommendation?

MS. LANGE: I think that that's an appropriate thing to do, to include the Monroe. It's not being accounted for in the Gulf, and they're a stock that's being fished on the Atlantic, and we should keep track of those numbers.

DR. SEDBERRY: Thank you. I agree with that. Is there any -- Does that give anybody any heartburn, or is there any objection to that? Okay.

DR. CROSSON: One done.

DR. SEDBERRY: I have also heard that there is no problems with the time series, with continuing with the same time series, and it's still appropriate, even given the changes the catch data. The trends are the same, even though the magnitude is a little different. Everybody is good with that?

DR. ERRIGO: That was the original time series, or the original reference period, that the SSC came up with for dolphin, which is 1994 to 1997, which is different for all the other species.

DR. SEDBERRY: And we will see that when we get to some of the other species.

DR. NESSLAGE: I am confused by the Excel spreadsheet, because it says, in the little box on Row 50, it says the SSC originally specified 1994 to 1997 to be used for dolphin. However -- But the ORCS ABC was calculated from the same set of years, and so that's assuming we -- We have to decide on which method then, right, ABC or ORCS, before we decide on reference period, because we have different reference periods, and is that how I'm reading that?

DR. ERRIGO: Originally, the ABC was calculated in the Comprehensive ABC Amendment not using 1994 to 1997. It used the same reference period as all the other species, and I think that was an oversight, and so that's why I have the years there, looking at both of them. In terms of the ORCS, you can -- I mean, I supposed you can say that we'll use the ORCS to come up with it, with this justification, or you can wait for the new ABC control rule to go into place, at which time you're probably going to have to re-look at a lot of your species, and you can make that change then.

MS. LANGE: Mike, what you said before, the ABC control rule was approved, which included the decision tree for a bunch of the stocks. Subsequent to that, ORCS came in with a more refined method for looking at ABCs, but that has not been approved as the ABC control rule by the council, or it's only been approved for some stocks? Where is the issue?

DR. ERRIGO: The ABC control rule -- There is a control rule for each fishery management plan. The ABC control rule is meant to be used for everything, but it has to be added to each fishery management plan, and it hasn't been. Parts of it haven't been added to all of the plans, and so the ORCS methodology was not added to the Dolphin Wahoo Fishery Management Plan when it came out.

MS. LANGE: So, for right now, the only option we really have, to be in compliance, or whatever the term is, is the decision tree method, and we can't really provide recommendations based on the ORCS method for dolphin wahoo at this time. That's why there is a difference in this stock compared to the other stocks in your spreadsheet.

DR. ERRIGO: Yes. You can use a different method and just give justification for why you used this method, even though it's not what the control rule says, but --

MS. LANGE: I was just trying to clarify the confusion of why dolphin wahoo is different and why the years are different and why ORCS versus decision tree.

DR. SEDBERRY: All right, and so we move to wahoo?

DR. ERRIGO: I think wahoo is way more straightforward.

DR. SEDBERRY: Okay. I think they are probably all more straightforward, but wahoo will certainly be -- Well, it has many of the same issues, and so we have discussed them already, and so, yes, let's do wahoo.

DR. ERRIGO: I have notes in here. You see how the landings at the very end go enormously high from where they were, and that is not all caused by the calibration. A lot of that is caused by the Science Center's weight conversion methodology, and so that's why that is happening, but that's not from the calibration, or it's not all from the calibration. We see the same thing in spadefish.

MS. LANGE: I was going to ask that, because I did notice it. What is the Center's calibration, and why is it used, and why is it making such a big difference?

DR. ERRIGO: That's a short question with a very long answer.

MS. LANGE: I guess the question is how does it impact our ability to approve the new method, or the new dataset?

DR. ERRIGO: The Center's weight conversion is a little different from MRIP's. What MRIP does is they impute weights based on statistical methodologies and lengths, if they have lengths but not weights, and things like that. What the Center does is they compute an average weight that they can apply to the numbers of fish, to calculate the weight, but they have a sample size cutoff, and it's thirty fish in a strata, and, if they don't have that many weights in a strata, then they move up to a wider strata that pools all the strata beneath it and to try to get that sample size, and they continue to do that until they reach their sample size cutoff, and so that's their methodology, and it's different from MRIP's.

The reason why sometimes it's a huge difference and sometimes it's not has to do with how many weight samples there are in a given stratum. Sometimes there is like two weight samples in a strata, and so they have to pool way up to get their thirty-sample minimum, and the average weight that they get from that could be wildly different from the weights that were in the strata, and so you get very different results from MRIP than you do from the Science Center. How it affects your ability to set ABCs and whatnot, I don't know. This just is what the data is. All I can say is we have said that the new MRIP numbers are good, and the Science Center has said that their weight conversion is the best science, and so these are the numbers.

DR. SEDBERRY: We had a presentation on this at the MRIP workshop, about -- Her name doesn't come to mind at this moment. Who gave the presentation?

DR. ERRIGO: Vivian Matter.

DR. SEDBERRY: Vivian, yes. It was about what they do, and all those presentations were very detailed and very complicated, but we got through it and agreed that what they do was acceptable to the SSC as the best scientific information, and so, like Mike said, that's where we are.

MS. LANGE: I just wanted to, again, sort of clarify it during this discussion, because it comes up for several of the stocks.

DR. SERCHUK: The one thing that strikes me differently about this species, as compared to the dolphin, is that, for the most part, the series are congruent, in terms of scaling, but, near the very end, there are some large differences. For example, that most recent datapoint looks to be about the third highest, whereas the most recent datapoint on the blue line is not the third highest, and so there's some slight changes here, as opposed to what we were seeing in terms of the relative position of points, and I'm just wondering -- It's a little bit more complex than the first one we saw, which was a complete scaling of all the points and maintaining their relative position with the MRIP data. In other words, that last green point there is about just a little bit below the 2006 point, and you can see that's quite a bit different than the old data, and I'm just wondering if there was any discussion in the group of this.

DR. ERRIGO: Yes, there was. They actually asked for me to look into the 2016 spike, the second-to-last one, and I did, and that's where I came up with the majority of the reasoning why those datapoints at the end are so much different, is from the weight conversion, but it's just an artifact. What it is, it's the Science Center's weight conversion together with the calibration, and so those strata that were expanded to be much higher happen to be the strata where the weights were significantly different in the Science Center's calculations than they were in the MRIP calculations, which caused the landings to explode much higher than they did in the actual MRIP, if you just looked at the straight-up MRIP stuff from the website.

DR. SEDBERRY: Mike, do you think it has anything to do with just the size of this species? This is kind of on the large end of a lot of these species, and that that weight conversion might have a larger effect on a larger fish, on a larger species of fish?

DR. ERRIGO: It has to do with the sample size and not on how big the fish are, because you see a massive spike in spadefish, and they're not that terribly big.

DR. SEDBERRY: Okay, and, compared to dolphin, this is a much less frequent species, and so less frequently sampled.

DR. ERRIGO: Compared to dolphin, yes. Compared to every snapper grouper species, no. I guess the question is do you agree with the ABC Workgroup's recommendation? They recommended including Monroe County, and they didn't see any issues with this stock, and so, Scott, you can correct me if I'm wrong, but I think the recommendation was to recalculate the ABC based on the previous methodology.

DR. SCHUELLER: Maybe I am missing it in the spreadsheet, and so, just to be very clear, the recommendation from the workgroup is to use the total new with Monroe green time series with the green boxes as the landings time series, and I'm fine with that part. The part where I don't see what the recommendation is, and pardon me if I'm missing it, is which one of the ABC lines is the recommendation? This is what I was getting lost with on the dolphin one. I don't know if it's

black, purple, pink, or olive green. It's not clear to me what the recommendation is, and that should be the biggest thing on this page, that the sub-committee recommends this and this, and I don't know what it is.

DR. ERRIGO: I'm sorry. I will be more clear with the rest of the species. The rest of them don't have so many choices. For this one, it's the green line that says third-highest with Monroe.

DR. SCHUELLER: That's what it was for the dolphin one, too?

DR. ERRIGO: Yes.

DR. SCHUELLER: Third-highest with Monroe is based on the decision tree?

DR. ERRIGO: Yes.

DR. SCHUELLER: That's all fine with me, but it's not clear, given what we've been provided for materials, and so --

DR. CROSSON: If that's the case, we definitely need to explicitly write this down, and I know that there's council in the room that would prefer that.

DR. SEDBERRY: Yes, please do, and thanks for asking that clarifying question, because you're not the only one that was a little confused by that.

DR. BUCKEL: The other thing that may be helpful is just showing that decision tree, because the discussion -- There was a question about why we were discussing the catch per unit effort and if it's declining or not, and that's because, in the decision tree, there is are we impacting the stock, and, if so, then we use a median instead of the third-highest, and so that's why we were having that discussion about dolphinfish. It pertains to where we end up on that decision tree.

DR. SCHUELLER: What years is this third-highest with Monroe?

DR. ERRIGO: The years for wahoo are different. They are 1994 to 2003. I think those are the third-highest, from 1999 to 2007. I have to recalculate the ones from 1994 to 2003. I can show you the numbers tomorrow morning. This one was -- I was trying to not put too many lines on the graph. Instead, there weren't too many lines on the graph and not all the right lines, and it was a real tough -- It was tough ones, dolphin and wahoo, to figure out what to do with these, and so I will recalculate -- I mean, I will get you the right numbers and show you what it would look like, and the years are different between dolphin and wahoo.

DR. NESSLAGE: I am going to throw a little wrench into this, just to extend the conversation, because I am enjoying it so much. So, I know we reviewed, or at least had a presentation, on the Center's calculation of average weight that is used to calculate these landings, but I guess I'm wondering -- Is that appropriate for what we're trying to do, in the sense that, if we don't expect the average weight of dolphin or wahoo, in this case, to change that much year-to-year, then is it really appropriate to do that going up the strata, as opposed to borrowing from adjacent years, which is what I would do as an assessment person, rather than -- If I didn't think there was a large change in weight from year-to-year. If that's the case with these animals, and I don't know them

that well, then, by all means, we should be going up the strata, but, if not, then maybe we should be borrowing from adjacent years.

DR. ERRIGO: That is a very good question, but probably one that needs to be tackled elsewhere. I don't think we can just say, yes, you guys should do this, and it probably needs like a workshop or something, maybe at a SEDAR or something like that, and I do know that MRIP and the Science Center have been trying to line up, and they have not come to reconciliation, as far as I know, at this point, but they are -- They were working on it, the last I heard, but, yes, they are -- The MRIP methodology may not be getting you what you're looking for, and it may also have biases in it, because sometimes, when they need to impute, if they don't have lengths, they are imputing from other fish that are in the same strata, and that doesn't -- Just because they're in the same strata, it doesn't mean that they're the same weight. I have that the SSC recommends using Monroe County landings and calculating the ABC using the third-highest from 1994 to 2003, which are the years for wahoo. Now I suggest that we move on to snapper grouper species, most of which are fairly straightforward.

DR. SEDBERRY: That sounds like a good idea to me. Does anybody have anything to say before we leave the dolphin wahoo Monroe County line?

DR. NESSLAGE: Just that would folks -- Would it be helpful to have that as a recommendation, that they soon get that resolved, because this is going to have an impact on stock status, correct?

DR. ERRIGO: I wouldn't say stock status. There is no status in this, but I understand what you mean. It has a huge influence on the ABC, and it has a huge influence on tracking the ABC and things like that, not to mention the fact that it is very difficult to have one data stream that everybody can see and another data stream that nobody sees that is actually the one that is tracking the ABC, and then people are like, what do you mean, and it says that the landings are this, but, really, the landings are this, and they don't match.

DR. SEDBERRY: This would be a recommendation for MRIP and SEDAR to look into, and so I guess it's actually a post-MRIP and pre-SEDAR step in there, and so I guess the recommendation would be to the Center to do that.

DR. GRIMES: Out of curiosity, does this difference exist with all the other Science Centers in the country, between MRIP and the way that they do it?

DR. ERRIGO: As far as I know, it -- MRIP isn't ubiquitous everywhere, but, in the Northeast, no, they use the MRIP weights, and I don't know about the west coast.

DR. SEDBERRY: Okay. I think we're ready to move on to reef fish, snapper grouper.

MS. LANGE: Was that a recommendation from the SSC that something be done to resolve -- I am trying to get it in the notes.

DR. SEDBERRY: Yes, we want to make sure this is a recommendation from the SSC, and so we concur with this.

DR. ERRIGO: I can refine the language, and the rest of the SSC can also wordsmith that.

DR. SEDBERRY: So we'll work on the wording on this, and you will have a chance to look at it in the report draft.

DR. LANEY: Mr. Chairman, didn't we agree though, at the MRIP workshop, that the Southeast Fisheries Science Center methodology was the best available science? What does that leave to resolve, I guess is my question.

DR. ERRIGO: At the MRIP workshop, what you said was that there was no trend or bias in the Science Center's conversion methodologies and the calibrations for the charter boats that may be causing any of the differences between the two data series, and so that was fine. You never reviewed their methodology for weight conversion and said this is best science, and so that's not something you need to worry about.

DR. SEDBERRY: I can't remember the exact wording, but it had to do with the bias, any introduced bias at that step, and we can certainly make recommendations for improvement, and even have it as a research recommendation to test this against that, even if we have previously agreed that something is the best at the time. Okay, Mike. Lead us through the next one.

DR. ERRIGO: Okay, and so here is spadefish, and, actually, these two points, but mostly this one, is caused by that weight conversion methodology. The actual MRIP calibration numbers are all the way down here, but I think that was just a poor year for sampling or something.

DR. SCHUELLER: I just have a basic question. When you're looking at the old ABC and new ABC, when you look across species, some of these are flat, and some of them have a stairstep, and I was -- I am not sure why some have a stairstep and why some don't, because the reference years should be the same.

DR. ERRIGO: That's a good question. All the ones that have their ABCs set by ORCS have a stairstep, because they originally were set using the decision tree, and so that's just time series of what their ABCs were, their actual ABCs, and I just recalculated the old ABCs into the new ones, and so there is a step, and so it's decision tree for the first few years, and then we switched to ORCS. If you would rather me just take out the step, so you can see what the actual -- I can even extend them back in time.

DR. SCHUELLER: I understand the step now. I just wasn't sure, and I figured there was something going on. The black line is the old ABC calculated based on the blue line. However, the black line is greater than any point in that blue line.

DR. ERRIGO: The ORCS methodology is not like the decision tree. It's very different. You take the highest landings in the reference period, and you multiply that by a scalar that is based on this risk of overexploitation, and so this was considered to be moderate, and so the associated scalar was 1.5, and so you take the highest landings in the reference period and multiply by 1.5, and then you take the council's risk tolerance scalar, which for this species was 0.8, and you multiply that, and you get the ABC, and so it can happen that the ABC is higher than all the landings in the time series.

DR. SCHUELLER: I was just going to say that there's a new ABC control rule amendment underway, right, and we should address that in there a little bit more thoroughly and thoughtfully.

DR. SEDBERRY: That might be a good recommendation, if we can agree on how to word that.

DR. SERCHUK: My mind is as boggled as Amy's when I look at this, particularly when you see the catches going down. One, it just seems incongruent, and so I would echo Amy's point that it's a good thing that there is a re-look going on, because this would -- It doesn't seem to be a control rule that seems to make a lot of sense. Thank you, Chair.

DR. SEDBERRY: Thank you, Fred. Marcel, did you have something?

DR. SERCHUK: No, and I understand that, but I think that's a different discussion, because that's a discussion about a control rule, and so this is the control rule we have. Now what we can do is make our -- We can deviate from our recommendation and make our recommendation more cautious, because of that, but that's a different discussion than applying a control rule, and so I think we need to be careful to split those two discussions, and so, if there's a concern by the SSC about the new ABC, then we need to formulate our concerns around that new ABC. Does that make sense?

DR. SEDBERRY: Yes, and I think, at the end of this discussion regarding the ABC for many different stocks, that we can have some general research or procedural recommendations that we can make to the council that, as long as they are working on their ABC control rule revision, that they might want to look at these things that came up during our discussions.

DR. REICHERT: I think Fred and Amy's points are well taken, but it's just that I want to make sure that we have the right conversations in our recommendations.

DR. SEDBERRY: I think that we're going to run into some more things just like this that we need to make recommendations on at the end.

DR. SCHUELLER: I'm fine with that, and I understand those limitations. I just -- There are other things we can say besides just what Fred and I said about data-limited or ORCS-type things. There is a lot of research that has happened in the subsequent years that hasn't been included, and should be, and so --

DR. REICHERT: To that point, I completely agree.

DR. SEDBERRY: Yes. Thanks.

DR. BUCKEL: I agree with that, but I also want to say if the ORCS approach -- We didn't have this full time series when we set the scalar, and so, if there's something from this time series that you think, well, we should go revisit if it's slightly exploited or moderately or heavily exploited, and that would change the scalar, and so that's -- Before we throw the baby out with the bathwater, we may want to look at the time series and revisit those scalars.

DR. SEDBERRY: Very good point. We will make sure that we capture that and that's in our kind of general ABC recommendations.

DR. ERRIGO: The workgroup had some concerns, because of that huge spike and some of the larger changes in the time series, and they recommended to come to the full SSC for discussion, and so I was just putting it out to the SSC. Does the SSC agree with using ORCS and the reference period 1999 to 2007 to set the ABC for spadefish? It would be this upper part of the purple line would be the ABC.

DR. SERCHUK: I will raise the same issue that we raised before, and that line is being heavily influenced by one datapoint, and the one datapoint is the spike, because it suggests that --

DR. ERRIGO: No, that's not in the reference period. The reference period goes from 1999, which is right here, to 2007, which is right here. Those are the only years that are in the reference period and that are used to calculate the ABC.

DR. SERCHUK: So the new ABC is then higher than any of those points but one, and is that what you're suggesting?

DR. ERRIGO: It actually is higher than all of those points, but that's due to the way the ORCS methodology works.

DR. AHRENS: I think this is certainly something when the ABC control rule comes up, and ORCS does not perform well in an MSE.

DR. SERCHUK: That's where I'm suggesting where is common sense coming in, and I realize that we're not bound -- Maybe this is not the time to revisit it, but the fact is that you're getting something from the control rule that is unexpected, given the performance of the fishery, and then I think that we should not be bound by the ABC control rule if it's giving an illogical or an anomalous result. That's all, and maybe this is not the time to discuss it, Chairman, as you said, but here's another case where I think revisiting this ABC control rule for this stock might be appropriate. Thank you.

DR. SEDBERRY: We can deviate from the ABC control rule with justification, as these things arise.

DR. BUCKEL: So, Mike, is the scalar 1.5 for this? It's between lightly and moderately, and so, if you went to moderate, it's one-times, and, if you went between heavily and moderate, it's 0.5 to one, and so it could be half. If you said there's an indication that it's heavily exploited now, then you would drop to a scalar of 0.5 instead of 1.5 times that value, and so that's part of the -- There is some flexibility within ORCS and the control rule.

MR. CARMICHAEL: Be careful about saying things that are erroneous, because the SSC had the information, and, in that example of the blue line through 2011 or so, maybe, and they went through a pretty exhaustive process, over at least two years and multiple workshops, of applying ORCS and evaluating it and evaluating the landings trends, and there was a whole series of metrics that were scored with SSC and AP members, and they saw exactly how the ABCs came out relative to those landings trends, and the council and the SSC were comfortable with those ABC recommendations.

I don't know that the outcomes now that say that it looks erroneous -- Well, one of the things you're seeing is you're seeing what happened since then relative to the ABC, and, if there are stocks where the landings have exceeded the ABCs, then, obviously, the council has to take action, but it doesn't mean that the basis of that ABC is necessarily wrong, and I think Rob mentioned a point of further evaluations of how ABC performs that maybe are more robust than when it was done, and I think that would be the kind of stuff that needs to be talked about when we reconsider whether or not ORCS should be part of an ABC control rule going forward and are there are other ways -- One of the things we've tried to do in the ABC control rule amendment is to give you more flexibility, which I think would be good, but the focus of this meeting has been how has the change in MRIP data affected those ABCs, and what Mike is also trying to capture, by showing you those lines at the tail-end of the series, is how the fishery performed relative to those ABCs.

The wahoo example, the fact that landings have been above that ABC for a couple of years, is certainly something the council is probably going to need to take action to rectify, but that's application of the ABC versus implementation of the ABC and how you derive the ABC. Our focus here really is on deriving the ABC and do you think that the higher line in this example makes sense, given the old line and then the changes in the MRIP data, and that's really what we're focusing on here.

I think, if we are concerned about performance, that's something that probably needs to come up in another level and particularly about these ORCS things. If you notice something with some of these stocks where you're like, repeatedly, this particular control rule application, and there were landings that exceeded that control rule over time, well, that's kind of another question, and, in some cases, it may just be that the council maybe didn't respond, or they weren't aware of these changes until now that we're looking at.

DR. SEDBERRY: Thanks, John. The workgroup recommended bringing it to the full SSC, and the SSC recommends revisiting the ORCS methodology when discussing the ABC --

DR. ERRIGO: Does the SSC agree with using ORCS and the new data now to come up with the ABC?

DR. REICHERT: Well, I think the way the workgroup looked at this, and correct me if I'm wrong, other workgroup members, is were there any reasons for us to deviate from a decision that we made earlier based on the difference between the old and new estimates, and I think the working group said there were none, correct?

DR. ERRIGO: Yes, I believe that is correct.

DR. BUCKEL: I will just add that we also said, during the webinar, and there was only the four or five of us on that, and the full SSC, or other members of the audience, might be able to weigh-in on if they feel like this species has moved from lightly exploited to moderately or highly exploited, and so we would appreciate any feedback on that about the spadefish.

DR. SEDBERRY: Do any members of the committee have anything to add to the recommendation of the workgroup? Does anybody disagree with the recommendation of the workgroup? I think the recommendation of the workgroup becomes the recommendation of the SSC.

DR. SHAROV: I would like to bring up a discussion from the previous species on the effect of the weight calculation and conversion methodology. In this particular case, this is just mind-boggling, and it is -- Yes, I remember the presentation in August, and I understand the reason why it's being done, but this huge difference in these conversions makes me think it's -- Well, is there potentially a significant bias, in the sense that, when you're -- What actually then brings you to your estimated average weight when you increase your sampling -- Well, not the sampling unit, in this case, but the strata, but you are increasing higher and higher until you get the thirty fish for your sample size, which supposedly should be then unbiased for the covered area, based on the sample size in itself, but, in terms of the representativeness, or the distribution of those sizes in the fishery, we have no idea what it is, but certainly it seems that if the distribution of the weights of those fish were not random, or not uniform, throughout large areas, that expansion that initially was designed to avoid the random effect of the small numbers of fish and their effect on the average size, that the expansion may result in significant inflation of the average size, which is also caused by a number of samples of large fish collected in the particular area, and I am speculating here, but this certainly is worth investigation.

I am just -- I am sorry that I am not willing to just accept that this is just a perfect number that is based on the best scientific -- The BSIA, as we say it, and that certainly reflects what is happening, and I cannot imagine that the numbers from MRIP have the same range of fluctuation as we see here, and so the conversion in weight is just simply needed for the fact that the ABCs are being set in weight.

I would just like to add a comment, or a recommendation, that, in cases like this, an investigation is also needed as to how those conversion factors are being calculated. In other words, we see a problem with the ORCS methodology, that you shouldn't be applying it blindly, and so the Southeast Fisheries Science Center methodology should not be applied blindly here, and some investigation is required. Sorry for a long talk on that.

DR. SEDBERRY: No, that's a good recommendation. Thank you.

DR. ERRIGO: You can also, if you are so inclined, there is another solution to the problem. You can recommend that for certain species, low-landing species, unassessed species, that they be tracked in numbers, rather than in weight. That's not an easy -- That's not just like snap our fingers and everything is tracked in numbers, but you can make the recommendation, and the council can consider it. That's up to the SSC.

DR. SHAROV: That would make, really, a lot of sense for many species, where you do not expect a significant variation in average weight if the regulations are consistent, and there is no expected fluctuations based on the biology of fish that are very quickly developing biomass and quickly dropping their biomass. Eliminating this element that brings so much of the uncertainty, or potentially bias, is well worth it.

DR. LI: I am trying to recall, in August, at the MRIP workshop, when Vivian gave the presentation about the conversion -- Did she only cover the cases where the sample size in one strata is not a problem at all, or did she also cover the cases when the sample size in a strata is not enough, but, here, we only see the problem here, based on our understanding of our discussion so far, is caused by the sample size -- It's caused by one sample size for one strata is not enough, and so they are

pulling from the surrounding strata, and that caused the deviation here, and so, I mean, our recommendation or conclusion or comments from August is not covered here, and it's different.

DR. ERRIGO: Let me just say that I am speculating, based on what I know about the weight conversion, about what could be happening here. Basically, I think that the average weight being calculated by the Science Center is significantly different from the average weights that you calculate from the imputed weights that MRIP is giving, and, therefore, when it's expanded, you get significantly different estimates of landings and weight, and that often happens when the sample sizes are too small, because, if the sample sizes are large enough, and most of the fish are sampled for weight, then they should be exactly the same, and, a lot of times, you will see that they are, for well-sampled species, but, if the sample sizes are too small, and you have like two fish sampled over here in Florida and three fish sampled over here in North Carolina, then, oftentimes, those are significantly different, unless the weight of those species is like the same across years, because MRIP will impute weights, and the Science Center will average weights across years for species like that.

DR. LI: I am thinking that, when we make our recommendations, can we make specific -- That we want to investigate in-depth about the cases when the sample size is not enough for the strata.

DR. SEDBERRY: Yes, we can certainly make specific research recommendations, yes.

DR. LI: Also, I have one comment, and that is we want to know the truth about two methodologies that are leading us to different answers, and which one is most close to the truth, and that makes me like less comfortable.

DR. SEDBERRY: You're right. It's kind of a strange situation, yes.

DR. SCHUELLER: I have two separate things to say, I guess, and so, Genny, your recommendation was to aggregate -- I was looking up the hierarchy that they state that they use, and they use, according to this list, species, region, year, state, mode, wave, area, and so there's this hierarchical method, and your recommendation was to do -- Sorry.

DR. NESSLAGE: I guess my off-the-cuff recommendation, not knowing exactly how it's done, was, rather than borrowing from higher, larger strata, to borrow from the same strata, but in adjacent years, if they had adequate sample size.

DR. SCHUELLER: So move year up in the list? Okay. Those are things that ought to be compared, and I don't know what impacts they will have. Probably, for some species, it will be minimal, and, for others, perhaps it will be larger, and so that was my one comment. My other one was back to what Alexei was saying. The ABC that's up here -- The points of which you're concerned, are they all of the points in the time series or the peak points, because the ABC is calculated using points that are not peak points, and so, to me, if your concern is the peak points, then the concern isn't necessarily in the calculation of the ABC, but rather in the tracking of what's being caught and whether or not, for example, if this fishery had that ABC, it would get shut down, and that's a different thing than the ABC calculation, and so I'm just looking for some clarification.

DR. SHAROV: Thanks, Amy. I agree and accept your correction. That's why I said that it was sort a side or additional recommendation, and it's not necessarily directly related to the ABC

calculation, and I agree here, although, if there is a problem with the weight conversion, then the significant drop might be an issue as well, and so it may have an effect, but correction accepted.

DR. SERCHUK: Just, to this point, and forgive me if I'm flogging a dead horse here, but, under the old ABC, it looks to me like, in 2014, the fishery caught significantly more than the ABC that was for that period, and does the council then say, look, we are going to wait another year to see what happened, or if it's aberrant, and I'm just wondering what the relationship is between an ABC and the catch in that year, because, typically, if you have an ABC control rule, if you exceed it by a significant amount, enough, under this, if I read this correctly -- If it was exceeded by it, the council would then either take some action or at least express some concern that, instead of being 300,000 pounds, it was 750,000 pounds and we need to do something. I am just wondering, retrospectively, did anything occur then?

DR. ERRIGO: I can tell you how it works for these species. For unassessed species, what is done right now is, if there is a large spike in landings like that that goes way over the ACL, and these species don't have OFLs, and so we don't have to worry about it exceeded the OFL and it is overfishing, but, if it exceeds the ACL in the year, even by a lot, the next year, we track in-season the landings, and, if it again is going up and trending the same way, that it's going to exceed the ACL, then we close in-season.

The reason why we chose -- The reason why the council chose to do it that way is because, for a lot of these species, the interannual variability is extremely high, and the PSEs are extremely high, and so you could get large swings in landings that are really just sampling error and noise. If you look at this time series, that 2014 spike is surrounded by much lower landings.

DR. SERCHUK: Excuse me, Mike, but, based on the variation before that, there was very little variability around the inter-year variability, and so that would suggest to me even more of a reason to be concerned. Thank you.

DR. SEDBERRY: Can we make any decisions on this before we take a break, or do we take a break?

DR. ERRIGO: Well, the SSC did recommend setting the ABC using ORCS and the reference period 1999 to 2007.

DR. SEDBERRY: That addresses the action items. Okay. I am going to suggest that we take a break and come back at forty after, 3:40.

(Whereupon, a recess was taken.)

DR. SEDBERRY: Please make your way back to your seats, so we can get started, or re-started, on our next species to review the ABC, which will be bar jack, an exciting reef-associated species. Mike or Scott, whoever wants to say a few words about this one.

DR. ERRIGO: Bar jack is one of those species where the differences between the old time series and the new time series are not that terribly big, except for a few years where the new time series spikes up much higher, but, other than that, the landings are very similar, and the trend is really unchanged between the two, and the workgroup noted that.

They also noted that there really aren't any concerns with bar jack. There is a large amount of variability, which indicates most likely a rarely-encountered species, which it is, and MRIP doesn't see a ton of them, and so the recommendation was to just recalculate the ABC based on the previous methodology, which is ORCS, and the reference period for all the rest of the species is the same. It's 1999 to 2007.

DR. SEDBERRY: Thank you, Mike. Does anybody have any comments or discussion regarding the data or the workgroup's recommendation? All right, and so the SSC concurs with the workgroup's recommendation, and we can move on to the next species.

DR. ERRIGO: I think we'll come back to black grouper. I really like making progress. It feels good. We can't assess it, but the landings trend is very similar between the old and the new time series, and it's more divergent at the end, which is expected in a lot of the time series, and that's the usual -- That's the common trend for a lot of them.

DR. SEDBERRY: So the workgroup has recommended the SSC discuss, due to the importance of this species to the fishery, and perhaps consider for a higher-tier assessment, but there's problems with ageing of this species, and it may be more difficult to get into a higher tier. Does anybody have any discussion?

DR. REICHERT: Well, remind me. I think the higher tier was mostly because this was a species where we actually have a little more information than just landings, and I think that's what we discussed during the workgroup webinar, and is that correct?

DR. ERRIGO: Yes, and there are other assessment tools that you can use besides age-based assessments, like production models and things like that, and so, as you said, there's a lot of other ancillary information, and there is MARMAP trend information and things like that.

DR. SEDBERRY: This is a species that traps pretty well, and so MARMAP has good fishery-independent abundance estimates for this species.

DR. REICHERT: Those trends were presented to the SSC and to the council and recently to the AP.

DR. ERRIGO: Could you remind us what the trend looked like? I can't remember.

DR. REICHERT: I am looking it up as we speak.

DR. SEDBERRY: In the meanwhile, Jeff, did you have a question or a comment?

DR. BUCKEL: I think it was in August that Erik Williams -- At our last meeting, he mentioned that the Science Center was planning to do some data-limited approaches on some of the species, and I'm not sure if anyone from the Science Center can comment and if gray triggerfish is on the docket for something like that. I mean, those are some of the Tier 2 and Tier 3 -- Those are specific types of data-limited approaches, but there are newer ones out there, and so I'm just curious if that's happening.

DR. REICHERT: The fishery-independent index, and it's just a trap index, and it doesn't include the video data, since -- The reference period was -- Can you remind me again?

DR. ERRIGO: 1999 to 2007.

DR. REICHERT: That was a period where the densities varied, but they were relatively stable, and then there was an uptick from 2009 through 2014, and then the recent years have hovered around the long-term average, and the last couple of years it trended down a little bit, and so there's variability, but, in recent years, there was a distinct trend. I'm not sure if that helps, and I can pull that up, or, actually, you guys should have it in your briefing book from the meeting where we presented that.

DR. SEDBERRY: Yes.

DR. ERRIGO: So it increased through these years, and then it was stable like through these years, and you said that in 2018 and 2019 it trended down?

DR. REICHERT: 2016, 2017, and 2018, it trended down, and there was an increase from 2009 or 2010 through 2014.

DR. SEDBERRY: Do we have any information on what's being considered as a higher-tier assessment? Amy, do you have anything on that? I can't remember what -- Let me look back in my notes and see if I have anything.

DR. ERRIGO: How does the SSC feel about using ORCS and the 1997 to 2007 reference period to give this an ABC until other methodologies can be used to maybe get a better handle on maybe stock status or a better idea of what the ABC should be?

DR. SEDBERRY: That sounds like a reasonable approach to me. We have a thumbs-up from Genny, two thumbs-up. I don't hear any objection to your recommendation, Mike. That sounds good. Mike has summarized it. That looks good to me. Does anybody have any objections?

DR. ERRIGO: We can wordsmith it.

DR. SEDBERRY: Yes, and we'll have the opportunity to fine-tune it and edit it. All right. I think we're ready to move on to hogfish.

DR. ERRIGO: This is the Georgia to North Carolina stock of hogfish. From discussions, this is most likely an underestimate of the actual landings, and that's because spear landings north of Florida are not really sampled by MRIP very well until maybe recently they are starting to better sample spear landings, dive landings, recreationally. Commercially, it's sampled much better, and so the commercial landings are probably fairly well documented, but the recreational landings are most likely non-existent, when they should be. They are missing. This was actually set using ORCS.

DR. AHRENS: Mike, why was ORCS abandoned?

DR. ERRIGO: ORCS was used previously.

DR. AHRENS: So this is where we're getting our decision tree?

DR. ERRIGO: No, and the third highest was put there because, in discussions with the ABC workgroup, they felt that it may not be -- The time series may not be reliable catch, and this may not be fully reliable catch, which is necessary for ORCS. There is catch missing from this time series.

DR. SEDBERRY: But there is still pretty good agreement.

DR. ERRIGO: Between the two datasets, yes, because most of the MRIP data is not there. There's almost no recreational landings there.

DR. SCHUELLER: So which of these is the recommendation, because there is --

DR. ERRIGO: I think the ABC workgroup was going to ask the SSC what they felt about using ORCS versus using the decision tree, based on this.

DR. SCHUELLER: The purple, and so the new ABC line, is that -- Where is that one? Is it hiding behind something?

DR. ERRIGO: It is. It is almost on top of the green one and under the red.

DR. SEDBERRY: The recommendation from the workgroup is the new ABC, which is kind of between the red and green?

DR. ERRIGO: Yes.

DR. SEDBERRY: That was derived using ORCS?

DR. ERRIGO: The purple line was derived using ORCS, and then the third-highest, the red line, is decision tree. Honestly, there's not much difference between any of them.

DR. SEDBERRY: Right. I don't see any reason to change anything then. Does anybody disagree? Are we ready to move on? Everybody is ready, yes.

DR. ERRIGO: Actually, scamp is in -- It's actually in a research track right now, and so we may not need to address scamp at this time.

DR. SEDBERRY: Did the workgroup have anything to say about scamp that we need to be aware of?

DR. ERRIGO: There is no notes there, I think, because scamp is in a research track, and we don't really need to address scamp. When I first put this together, I just forgot to take it out.

DR. REICHERT: Not that I think that I can read your mind, but we've got a research track, and then, after that, we need an operational assessment, and so, by the time that result comes to the council, it will be two or two-and-a-half years from now, and so my question is, in terms of timing,

should we address that now, or what is the council going to do in the interim? Are they going to stick to the original ABC, or should we make a recommendation now until the results of the operational assessment can be taken into --

MR. POLAND: At least from the council's perspective, I think I can speak and say that we would prefer a recommendation on the ABC, because we do have new recreational landings that we will have to track this fishery against, and so my inclination would be to provide us an ABC, and then, when we get the results of the research track assessment, we will get a new ABC.

DR. SCHUELLER: Marcel, you did read my mind. I am looking at the SEDAR schedule, and it looks like the operational assessment will not come until 2022.

DR. ERRIGO: Okay. That's a fair point, and I am now remembering the discussion of why we put this off, is because of the species ID issue with yellowedge, yellowmouth, yellow something. Yellowmouth. We wanted to look at that and discuss it, and I think we just --

DR. AHRENS: Having sat in at the data workshop on that, I think the general consensus was that it was a fairly small proportion of the catch, and it was probably fairly irrelevant to a recommendation.

DR. SEDBERRY: This is an ORCS species with a new ABC recommendation.

DR. NESSLAGE: I am just curious. Does anyone know why the landings are going down in recent years?

DR. SEDBERRY: There's been a lot of discussion of that.

DR. REICHERT: To that point, the fishery-independent index for scamp, and I'm trying to send the report to Mike, so he can distribute it to the committee, but the fishery-independent index has also been very low to well under half of the long-term average basically since 2006, 2007, or 2008, consistently, and so that trend is consistent with what we see in our fishery-independent surveys.

DR. ERRIGO: It also follows council discussions at the time When the ORCS amendment went in to change the ABCs, they actually put in an additional buffer for scamp, because there was concern about the health of this particular stock, at that time.

DR. BUCKEL: I would like to have some discussion to change the scalar then, given these different multiple data sources all pointing to the same thing.

DR. SEDBERRY: Yes, and so the fishery-dependent and the fishery-independent and the Snapper Grouper AP have all been reporting and concerned about this trend. I am not sure that they determined what it might be, and I think this is one of the shallow-water groupers, and I don't think that a lot of its spawning locations are included in any of the special management zones and marine protected areas, and that may be part of the issue, but I'm not sure.

DR. ERRIGO: What we can do is change the risk of overexploitation scaler from moderate high to high, which will decrease the scalar, the positive scalar, that increases the catch statistic, and then the council will discuss the risk tolerance portion of that.

DR. AHRENS: Mike, if we go to a high, then what's the range that gets applied to that scalar?

DR. ERRIGO: The scalar is -- It changes from 1.25 to one, and the risk scalar is set by the council, and so that's what it does. I have it set so that, if I change anything, it automatically recalculates, and so it was up here, and it went down to here, which apparently will not have any effect on the landings or the fishery, but it still is more conservative.

DR. AHRENS: Do we need to then have a discussion about the reference time period for this species?

DR. NESSLAGE: That was going to be my recommendation before Jeff recommended the scalar. If we don't know that it's overexploitation, is it the risk of overexploitation that we need to be worrying about or the reference time period or both? I had the same question, and I was edging towards revisiting the reference period myself.

DR. SEDBERRY: So the SSC is recommending that both the time series -- That the time series be reexamined and that the risk of overexploitation be changed.

DR. AHRENS: I think there's a challenge though, even if you shift the period on this, because you're taking the highest catch within that time period, and you have the spike in more recent years, which is going to just put you back kind of where you -- A little bit lower, but kind of back where you were.

DR. REICHERT: The other thing is, if you don't know what is happening past 2006, you look at the landings trends, and they are bouncing up and down for quite a while around the 500,000 pounds whole weight, and so, unless something happened with the fishery, you would say, well, that's -- Perhaps the population can sustain that fishery, because it's just been bouncing around that for a while, and then something happened in 2006, where both the landings and the fishery-independent index go down, and so I'm not sure whether -- I am trying to wrap my head around what happened around that time that -- Is a change in targeting? Well, no, because they weren't catching them, and so that makes me think that maybe we shouldn't change that reference period, but --

DR. CROSSON: Well, a lot of fisheries had a drop around 2006 to 2008 because of -- Well, I guess it's more 2008, when the recession hit, but then they bounced back, and this has not bounced back, and so that's a sign, to me, that the stock has some issues that are different than just fishing activity, because fishing activity has largely recovered.

DR. REICHERT: Yes, and I'm thinking of, for instance, the red grouper, where we think it's a recruitment issue, and I know this is probably going to come out at the research track, but there may be -- I don't know, but there may be something similar going on with scamp or competition of something else, and that has -- That may not have much to do with the fishing pressure. I would say perhaps to maintain that reference period.

DR. ERRIGO: I have to agree with Marcel. If you feel like it's an issue with let's say recruitment failure or a regime shift, where another species has moved in and it is competing for resources or something like that, that would change the risk of overexploitation for that species, because now

it's like a high risk of overexploitation or a higher risk of becoming overexploited or something like that, which would decrease the scalar, which is what we did. It doesn't necessarily mean that the time period, or the reference period, needs to change, per se, because, if you went back -- If the conditions changed and you think it might go back, then the reference period would be totally fine.

DR. AHRENS: I think, if you look back, they haven't -- If you go to the new ABC, they haven't achieved that in the last nine years, which is a bit worrisome.

DR. CROSSON: Help me out again. I am getting a little lost. The reference point, we're looking for a period of relatively stable catch as an MSY proxy, and is that what is generally -- All right. So then, yes, you do want that, and then how do you address the issue when we see that something is clearly -- It looks like there's a decent chance that there is overfishing going on and the stock may be overfished, and how do we address that with the process that we're in right now?

DR. AHRENS: I mean, if you have some sort of non-stationarity in the stock-recruit curve, and you're at a lower productivity regime, then, in theory, you are transitioning to that new regime relative to the effort that's out there, and you should see the realized -- Assuming effort is not overfishing, but effort is causing it to transition to that new MSY point, and that's what you would see. If it is overfishing, then you're going below that, but you don't know, if there is non-stationarity.

DR. BUCKEL: Mike, I'm curious. The heavily exploited on your Excel spreadsheet gives a scalar of one, but, in the Table 5 on the ABC control rule, it says 0.5 times the catch statistic, and maybe I'm looking at the wrong -- It's Table 5, recommended OFLs using the ORCS Working Group approach.

DR. REICHERT: That's in the ABC control rule document, or what document are you looking at?

DR. BUCKEL: That's the Attachment 4, and I may be looking at the wrong table.

DR. ERRIGO: There are two scalars that you multiply. 0.5 was multiplied by -- That's the council's risk tolerance scalar, and the risk of overexploitation scalar that the SSC set for moderately high was 1.25.

DR. REICHERT: Nevertheless, I think, as an SSC, one thing I think we should put in our report is that it is a species where we have some concern, and the council may want to be a little more conservative in their ACL, because of both the decline in landings and the decline in the fishery-independent index, until the results of the research track and operational assessment are known. Also, I think what we hear from the industry is that landings are down and they are not catching them.

DR. SERCHUK: Well, I agree with Marcel, but can't we be more helpful than that? The fact is that, if we're concerned right now that the stock may be -- That overfishing may be going on, it seems to me that I wouldn't recommend anything more than 200,000. I mean, if catches have been declining, I wouldn't -- I just don't know -- Wouldn't that be more helpful, if we could provide a range or a number, rather than just saying they should be conservative?

I am looking at it right now and saying, well, gee whiz, it's 200,000, and they've been -- There should be an upper limit, because the catches have been below that for the past few years, and I would say not to exceed, as a proposal for discussion, and I'm just thinking that, when we think overfishing -- I am just saying that, if we believe overfishing is going on and too much catch is being taken from the stock, would it be better if we could provide some guideline to the council for that? Thank you.

DR. SEDBERRY: Thank you, Fred.

DR. REICHERT: Well, two things. One is I'm not sure if we know that overfishing is occurring, because the landings have dropped simultaneous with the fishery-independent index, but -- I don't necessarily disagree with setting a lower level, but I think we need to make sure that we justify -- Whatever level we choose, that we justify that particular level, because, again then that will be a deviation of our ABC control rule, and we need to make sure that we justify that in our recommendations.

DR. SERCHUK: Just a follow-up, I would use it as a precautionary level until the assessment comes forth, and that's what I am trying to help the council out with and trying to get a sense of what you have talked about, about declining indices in the survey. Thank you.

DR. REICHERT: I don't disagree with you, but, whatever level we set, I think we need to be careful to justify why we chose that particular level, and that was all I was saying, and this is from the trends report.

DR. SHAROV: I think what Fred was proposing makes sense, and I do though share the thoughts that Marcel expressed, that, in general, it is reasonable to assume, based on the information that we have in our hands, that there is likely to be a decline in the population size, although we have not seen a trend in the index, right, Marcel, and so it is reasonable, but the point is are we going to be formulaic of subjective? Like Fred is suggesting a reasonable number that he expertly picked from the plot of the catch history, or we have a formulaic approach, where we could just simply say change the risk of overfishing from moderate high to high, and, this way, it follows sort of the standard methodology, but it reduces the calculated ABC.

I cannot believe that I offer this, because I generally am against just a formal approach, but I think it sometimes is important to maintain sort of the process, and so we have the ABC control rule, and we have the method to calculate the ABC, and, if we're concerned about the decline, we could add the buffer with increasing the risk of overfishing, and that's another way of doing this.

DR. SERCHUK: My concern here is that reference period, and I think it's from 1999 to 2007, and that's a period in which the stock has declined, and these indices have declined, and so, if you're setting it at an average during that period, and the stock is much lower now than it was during that period, you are going to have too high of a number, quite frankly, and that's what happens when you take an average during a period in which you have a decline. You're going to be someplace in the middle of it.

Here, I am concerned that the stock has gone into a different productivity period, perhaps, based on the surveys, and so using an average during a declining period is not a good thing to do when

that happens, and that's why I'm suggesting that we take a perhaps less scientific, but more commonsense, approach, saying, look, we're at one of the lowest levels we've seen, in terms of the entire survey time series, and catches have fallen also, because of that period, and try to look at a catch level for the recent period as an interim measure until we have a stock assessment, and we can talk about what that number should be, but that's my reasoning, Chair.

DR. SCHUELLER: I would like to go back to what Jeff asked, because I still don't see those numbers in Attachment 4 the way I guess you see them, Mike, and so, if you go to page 18 of Attachment 4, Table 5 says recommended OFLs using the ORCS Workgroup approach, and heavily exploited has a 0.5 times the catch statistic, and so that would be what should be put in, right, and I think Jeff put it in, and it's around 200,000, which makes sense, and so I don't know where the numbers are coming from, but they certainly aren't coming from anything in this Attachment 4 document under ORCS, because there is not even a 1.25 on here.

DR. ERRIGO: There are two scalars in ORCS. One is the risk of exploitation, and one is the council's risk tolerance.

DR. SCHUELLER: Where are they in this document?

DR. ERRIGO: I don't know. To be honest with you, I haven't looked through it. Okay. What's in that document is actually not what was implemented, and it's not what the SSC came up with, and it must be -- It must not have been updated, because it only has low, moderate, and high in it, where we have low, moderate low, moderate, moderate high, and high, and so there are five categories, and everything was divided up amongst those five, rather than there being three.

DR. REICHERT: So is there a document where we can just --

DR. ERRIGO: Yes. I can get you a document. I will need time.

DR. REICHERT: Yes, but that would make it easier for us to look up -- Well, let me rephrase that. That may clear up some of the confusion that we are having now.

DR. SCHUELLER: Can I just say, in the spreadsheet, that it says ORCS categories tab, and then that's where they are coming from, but are they in an amendment? Anyway, we don't have to get hung up on this. I am good with the 200,000 that Fred suggested, if we're going to make a suggestion.

DR. SEDBERRY: Yes, but it would be nice if the actual method validated that as well, just by -- So just by looking at it graphically. Wilson, did you have a question?

DR. LANEY: No, not a question, Mr. Chairman, but just a comment to say that Fred is right on, as far as I'm concerned. Some of you remember an old fairy tale about the emperor having no clothes on, and, when you look at that time series for scamp, I think, if you don't do something as an interim measure, as Fred proposed, then we're not being responsible, in terms of providing advice to the council.

DR. SEDBERRY: Thanks, Wilson.

DR. BUCKEL: It seems like the table and the spreadsheet is a risk of exploitation, and so that's -- You go through all the different life history and you're saying, well, what's the risk of exploitation, whereas the table in Attachment 4 is is it exploited or not, and if it's exploited, overexploited, where your biomass is -- Where you think it's low, then you're going to go with something below one to multiply by the catch statistic, and I think the difference is the risk of exploitation versus is it exploited or not, which is in the Table 5 of Attachment 4, and that's where the 0.5 is for something different than risk. It's is it overfished.

DR. NESSLAGE: I am going to suggest a minor modification to Fred's suggestion that, if I thought it through, might make some sense relative to the way that ORCS is normally done, and so maybe a compromise, but I haven't thought it through all the way, and so tell me if you think I'm off-base.

The ORCS method covers the time period 1999 to 2007, and so that's nine years, if I'm calculating right. If we think there's been a regime change of some sort, a biological regime change, then perhaps we should use the last nine years of the time series, and so shift it to the most recent nine years, which, if I did my math right, would be 276,524, and so a little bit higher, 76,000, more pounds, but awfully close to the ad hoc number of 200,000, and that would at least be consistent in using the nine-year time period. Of course, it would be affected by that weight conversion, and I just want to mention. If that changes, it would lower it closer to Fred's suggestion, if that were to happen, but, in the meantime, putting that aside, it would be a potential compromise to consider.

MS. LANGE: I would like to see the numbers for our recommendation, and I don't believe that we had it at 1.25. I thought we had other options, that we drop it down to 0.5, as Jeff was suggesting, whichever the table is, and, if our current method results in something like 200,000, then that supports it. If Mike can find the final numbers, that would be helpful.

DR. AHRENS: Just -- My concern is -- I don't disagree with Fred, in terms of there is some concern here. My concern is that we have to maintain some consistency in the rationale, and so, if stocks have been going up relative to that period, why aren't we choosing the later period to benchmark off of as well? I think, as long as we're really clear about the rationale for it and why we have deviated outside of what we've done with the other stocks, that's okay, but we have to be really clear, and I don't disagree with the premise.

DR. SERCHUK: I premised my suggestion, and I don't really care whether it's 200,000 or whatever it is, but on the fact that I see a trend in the most recent years that is quite different from the reference period. I am seeing a fishery that's been below 200,000 for the most recent years, and I was trying to get a number, and we can preface it any way you want, as an interim precautionary measure that wouldn't, in my mind, constrain the current fishery, although I expect it to keep going down, and so the 200,000 is higher than actually the most recent catches, but, from a precautionary point of view, I'm not willing to accept the current approach.

It's a little bit ad hoc, and I agree with that, and, if we could find a better rationale, that's even better, but the fact is that it's a bridge. It's a bridge to the assessment that's going to be done, and it's an upper limit on the fishing removals from the stock, and that's my rationale, and I think that's a reasonable, commonsense rationale. If we can come up with a way of getting a better number, that's fine, and that's consistent with the advice, but I'm thinking this stock is now very much different than it was during the reference period.

DR. SEDBERRY: Thanks, Fred, and I don't think there's anybody at the table that would disagree with you. I just think we need to clearly state the rationale and some way to relate this back to the ABC control rule. Not what went wrong, but just make sure that what we're doing is at least consistent with our previous thinking and with other stock assessments, with the overriding concern of what's actually happening in the landings and in the fishery-independent index in this species.

MS. LANGE: Mike, the very last page of Attachment 4, Table 6, example ABC options for catch-only stocks using the workgroup approach, how do those relate to getting something other than 1.25?

DR. ERRIGO: Those were preliminary examples. After the SSC met twice, once to come up with the risk of overexploitation category for each species and once to come up with the scalars, and, when they met to come up with the categories, they decided that low, moderate, and high was not sufficient, because too many things were getting pushed to moderate, and so, instead, they decided to do low, moderate low, moderate, moderate high, and high. Then, at the following SSC meeting, you came up with these scalars, which are in Amendment 29, which I emailed to everyone just a minute ago.

MS. LANGE: I have been on the SSC through all of this, and I didn't remember the specific table that you had up there, but I thought we had some more risk-averse values in there, rather than 1.25. I thought we had somewhere -- I thought it went less than one, but obviously I am wrong.

DR. CROSSON: I just wanted to answer Rob a little bit. NS 1 pretty clearly puts preventing overfishing as -- While maintaining optimum yield, but the very first things in there are to prevent overfishing while maintaining optimum yield, and so it's just that precautionary principle dictates that, at least if we see something that may be indicating a risk of overfishing, that we address it immediately, whereas the scaling-up stuff is important, and I certainly don't discount it, as an economist, because I know the value of it, but preventing overfishing has got to be the first thing that we think of.

DR. NESSLAGE: What I was thinking, to add to that, is that, if the catches do continue to go up and up, and the industry can explain why that's happening -- At that point, you would think you would have more data, and you might want to be collecting -- They will show up in the surveys more, and we might actually have a more informative assessment from those species, and so, at that time, you would hopefully transition from ORCS, or catch-only ABC setting, to some more sophisticated approach, I would hope.

DR. SHAROV: I don't know where we are, but I thought Rob was asking for the rationale for changing the reference period. I think I heard the general consensus that two things are happening. There is a declining trend in landings, and there is a -- There was a decline and a low state of relative abundance based on an index, and so, putting this together, I think it's reasonable for us to suggest that there is likely to be a decline or that a decline in the scamp population has occurred and maintaining the level of ABC that comes out of this approach would provide a significant risk of overfishing. I guess I am repeating, but that is to say that the fishing mortality would be generally much higher than what we normally would have expected for the stock being within the range of catch and the population state that we have observed in the past.

I think that's the rationale, that the data available to the group suggests that the population has declined and maintaining the ABC level based on the current methodology presents a substantial risk of overfishing, in terms of fishing mortality. Therefore, the recommendation is to reduce the ABC based on whatever Fred's or Genny's or an ad hoc approach.

DR. SEDBERRY: I agree with that, and I think we can craft a statement to that effect, and I think that we also need to mention that this is -- We recognize that there is a research assessment underway, but that the situation warrants an interim step.

DR. BUCKEL: I think the language -- Rob put it nicely, that this could be either due to overfishing, or it could be due to a regime change, and so, if it's a regime change, then you might do what Genny said and use more recent years to come up with the reference time period, or, if it's not, if it's overfishing, you use the original reference years, but you drop below that catch statistic to deal with the overexploitation. Either way, it comes out to a similar value, but I think that we can say that there is uncertainty about what's causing it, and we want to capture that, and, if you do it, either way, you're going to come out close to 200,000.

DR. AHRENS: It's my understanding though that, if you switch the reference time period, you are still going off of the highest catch in that reference time period for the ORCS method.

DR. ERRIGO: Yes, you are.

DR. AHRENS: Therefore, you would have to switch the reference time period to 2015 and forward, to achieve it, and so I think maybe we could have a super high category and go for a 0.5.

DR. ERRIGO: Remember that one of the reasons why the SSC chose the time period 1999 to 2007, which is kind of far back, is because there is very little effect of regulations. There weren't very many regulations back then for most of the snapper grouper species. If you choose time periods that are much closer, especially if you chose 2015 to 2017, there are a lot more regulations, like the grouper closure in the beginning of the year, the four-month grouper closure and things like that, which affect catch and landings trends.

DR. REICHERT: I don't disagree, but, if you look at the ABC, where the ABC is relative to the catches, there is still a huge gap, and so, in the period that fishery was open, the fishermen probably tried to catch scamp, and they couldn't, but there was no closure, and do you know what I mean? I think, still, if there was enough fish, then the catches would probably be closer to the current ABC, and they are not, by a long shot. In addition -- I will leave it at that.

DR. ERRIGO: I, for a completely different project a while ago, pulled landings for black grouper, gag, and scamp by month, and compared before and after the grouper closure, and the vast majority of landings -- Well, three of those species came during the grouper closure, and so, when they closed, they didn't make up for it after.

They didn't make up for it in the months that weren't closed. For some reason, they just caught more of those grouper during the grouper closure, and so, when they closed those months, the other months didn't go up to compensate. Now, also, the average landings during the months that were open went down, for most of those species, but there wasn't that like, oh, we can't catch them from

January through April, and so we'll just catch all those fish May through December. That didn't happen.

DR. SHAROV: I agree that that could have been the case, but how did that affect the fishery-independent index?

DR. ERRIGO: Well, that has no effect on the fishery-independent index. I am just saying that it probably has an effect on this trend.

DR. SHAROV: I understand. What I'm trying to say is that, if that was the reason, then what you're suggesting, that there was no decline in the population -- It's just there is all the changes in regulations, and there is less of the opportunities to catch, but, if that's the case, then you are curtailing the removals, and then your population at least should not be declining, and it probably should be increasing, and that's not what we see in the index, and that decline in the index is what really concerned me the most, and so we can't explain this by just simply saying that the trend in the catch is not necessarily a reflection of change in abundance, I agree, but, if you have a fishery-independent index and that one shows you --

DR. ERRIGO: Yes, and I wasn't trying to explain the trend in the catch. What I was saying is, if you use those years as a reference period, they are going to be affected by regulations, like the grouper closure. The landings are going to be affected by regulations.

DR. SEDBERRY: I think we have a good start here on the statement. I think what we need to do is state specifically what those concerns are and then specifically what the recommendations are for being more conservative, and so our concerns are the landings trend, the fishery-independent index trend.

DR. AHRENS: I think it would be worthwhile to state that what the fishery-independent -- That the SERFS --

DR. ERRIGO: It's just the trap index.

DR. AHRENS: Can we compare the SERFS index during the reference period versus the recent time and say what percent decline there has been in that?

DR. REICHERT: Yes, we can, but just keep in the back of your mind that this is a standardized normalized index, and so two is twice the long-term average, and 0.5 is half the long-term average, and I explained that, or Wally explained that, when we gave the presentation, and so, yes, you can do the percentage, but keep in mind that the -- Keep the axis in mind.

DR. ERRIGO: This is 1999 here, and it goes to 2007.

DR. REICHERT: The table is in the report too, and so we can do the quick calculation for both time periods. Just as a caveat, this is the trap index, and so this does not include the video information, and so it's the SERFS trap index. Again, as a reminder, SERFS is MARMAP, SEAMAP, and SEFIS, and so it's three programs that collaborate in doing this fishery-independent reef fish survey.

DR. SEDBERRY: Is the SSC concerned that the time series, the reference period, is the wrong period? I am not convinced of that, and I think Mike makes a good point, that it's important to have a time series where regulations have a minimum effect on landings, even though --

DR. ERRIGO: It was the SSC who decided that, actually, back when they picked the reference period.

DR. SEDBERRY: True, and that, even though the reference period may dip below the ABC, or above the ABC -- I don't know. It's a period of more stable landings, I guess, whatever our rationale was for choosing it before, and I don't see how that has changed. I don't know. Help me here.

DR. AHRENS: I think that the rationale for stability is -- You're assuming stationarity in whatever the underlying production relationship is. Therefore, given the -- If exploitation or effort out there has been reasonably stable over that period of time, then the population has come to some degree of equilibrium relative to that exploitation, given some stationary production relationship, and, therefore, that period of stability reflects some degree of proven potential, whether that's underexploited or overexploited, and you're not sure, but it's at least some sort of proven potential, and that's why you choose that.

In the case of scamp, there is concern that, recently, something has gone on that is potentially resulting in a decline in that population, potentially as a result of fishing removals, or it could be just a dramatic shift in the production relationship, and the F relative to FMSY may be significantly low, and it might be quite low, but you're in some sort of new world for scamp, I would say.

DR. SERCHUK: I am trying summarize what's just been said, and I think the important point, to me, to convey to the council is the productivity of the stock during the reference period may not be the same as during the most recent period, i.e., we believe it might be lower, based on the trends in the fishery-independent index, and that's the rationale, I think, for having a lower ABC or ACL value than that derived from the reference period. Does that make sense?

DR. SEDBERRY: Okay, and so I think we have our concerns summarized there. I would kind of like to add something from the Snapper Grouper Advisory Panel, that they're also very concerned about what they see in just lower catches of scamp, and I don't know how we can -- Maybe the rest of the SSC doesn't agree with that, but I hear that a lot, I guess because I attend too many meetings, but you hear it at the council meetings, and you hear it during the AP webinars, that the fishermen themselves are reporting problems in this fishery, and I think that's a concern. That's a good sign.

The SSC has concerns for the species and recommends the council be more conservative, and so we've listed our concerns there, I think, and I think we've summarized them all, and we can tweak it, and now if we can just address what we recommend when we say "more conservative when setting the ACL".

DR. REICHERT: I am not sure if this helps, but Wally just quickly calculated the average normalized index for the reference period relative to the most recent nine years, and that's 1.12 versus 0.41, and so, currently, it's at 37 percent of that of the reference period, and I am not sure if that helps any, but that was a question that you guys had earlier.

DR. SEDBERRY: So the fishery-independent index, in recent years, is 37 percent of what it was during the reference period?

DR. REICHERT: Correct.

DR. SEDBERRY: Okay.

DR. REICHERT: Thanks, Wally.

DR. AHRENS: I think maybe it would be reasonable to say that the council -- That we would recommend stepping, in terms of the overexploitation risk at this point, stepping outside of the table that we have and suggesting a level of 0.5.

DR. SEDBERRY: That is a good, definite suggestion, and I think we had talked about that, and I didn't hear any objection to it.

DR. BUCKEL: That's the NOAA tech document, and that's what it says for heavily exploited, to 0.5, and so that's -- We can reference that, if we would like.

DR. SEDBERRY: Very good.

DR. SHAROV: Just to beat to death finally that horse, as Rob mentioned several times, when we pick the reference period, the assumption is that the population is in a quasi-equilibrium state, and you pick -- Whatever approach you use, you define your level of landings that you believe is sustainable, and so, yes, there is a lot of assumption made there, because we have all the catch, but that's what we think, and, therefore, we think that, sustainably, we will maintain a certain level of exploitation rate, or fishing mortality, and so, if the stock has declined, as Marcel has suggested, just based on the comparison of the average value of the indices, threefold, then, to maintain the same level of fishing mortality exploitation rate as you assumed for the base period, you essentially would have to reduce your ABC threefold relative to the reference period, and that's the rationale, just assuming the sort of same exploitation rate that we thought was acceptable for the reference period for the stock.

DR. AHRENS: I think a recommendation to go along with this, when ABC control rules are revisited, is to really clarify what -- Make sure that, for the SSC, we know exactly what the scalars are that we should be applying, since we seem to have multiple tables floating around.

DR. REICHERT: My only concern here is, given the uncertainty around the recreational catches, this is pretty close. This is a value that's very close to the total landings, and that means that there is a significant risk of going over the ABC, which triggers accountability measures. I realize that is partly a management issue, but, given the uncertainty, which is something the SSC should consider -- Because we mean this as a stopgap until the research track and the operational assessment is completed. My concern is that this is very close to recent landings.

DR. ERRIGO: Scamp used to be fairly frequently encountered until fairly recently, and it's become now a rare event, which makes it prone to random spikes like you see for species like blueline tilefish or things like that. The other point that I wanted to make is, if you are concerned

about it, the steps in the table for the risk of overexploitation are steps of 0.25, and so high is typically a one, and so you can step down to 0.75, which would be the next logical step from where you were, which would put you there.

DR. REICHERT: Given the uncertainty of what we are doing, I would feel more comfortable with that approach, because, again, it's a stopgap, and it's likely that the landings will remain, in the next couple of years, at the level we are seeing now, but, given the uncertainty, I would feel more comfortable with this.

MS. LANGE: Does this stock not have the buffer that we spoke about earlier, where your accountability measures didn't kick in immediately, and was that spadefish, since this is an ORCS stock?

MR. CARMICHAEL: I am not sure what the accountability measure is exactly. I have just been trying to think about, procedurally and within the rules -- You guys have the ability, and clearly within the Magnuson Act, to deviate from your ABC control rule, as we've talked about, but I'm just wondering about procedurally and the best way. Going in and recommending a different scale for ORCS when ORCS is a piece of the ABC control rule, that's kind of a different way, as opposed to just saying we think the ABC should be this level and just giving the council a direct poundage.

I think, if the 0.5 is coming back to some idea of achieving a particular poundage, I think you would be better off just directly going at that poundage. If you want to look at these landings and talk about the trends and talk about the survey and things like that, then I think you could make a case where you feel like, applying the ABC control rule that was applied last time, we don't think that's appropriate, because here is what is happening in the stock, for all the reasons that you've talked about, but I'm not sure how it would be reviewed, and I don't know if Shep is on the webinar, but sometimes he can help us out with that, as to whether, if you can take the deviation in the way of just changing that scalar, which is one deviation, but it's certainly a little more of an indirect approach than if you just said we think the ABC should be 500,000 pounds or whatever it is.

You know, we've had stocks where I think you've given kind of a more direct ABC, and you said this is the reason why we think it should be this level and not that level, which comes out of the control rule, and, to me, that's where I think your deviation is. You apply the control rule, and that's part of the law, and you get this number. If, for some reason, you think that number is not adequate to protect the stock and prevent overfishing, then you can just directly provide another number.

DR. SEDBERRY: I agree with you, John, and that's how we got started on this. Fred had recommended 200,000 pounds, and we can deviate from the ABC control rule, but we need to justify it, and we need to support it, and I think, by just examining what happens when we adjust the scalar to what we think it really is, high, rather than medium high, or making the risk higher, which we agree it is, and it tends to set the ABC towards what we picked, what we have discussed at 200,000 pounds, and I think that's additional support and justification for deviating from the ABC control rule, and so I think this is more than just an exercise. I think it's actually saying, well, yes, when we adjust the risk of overfishing, overexploitation risk, if we adjust that to something we think is more realistic, it gets towards what we picked kind of graphically at 200,000

pounds, and so I think it helps support what we want to do and give justification for deviating from the ABC control rule.

MR. CARMICHAEL: I guess what I'm saying is the difference is the 0.5 is not part of the ORCS process as it exists, correct?

DR. BUCKEL: No, it is.

MR. CARMICHAEL: In the part that the council implemented? I didn't think that scalar was an option.

DR. ERRIGO: Right. Not what the council implemented.

DR. BUCKEL: It's in the --

MR. CARMICHAEL: It's in the document, but this group deviated from that document, and that's what we did over like two meetings, and so that was -- That's a reference, but the ORCS that we are going by needs to be the ORCS that is in the ABC control rule that Mike shared and sent around.

I think, if we want to change that control rule that Mike sent around in our implementation of ORCS, that's something that we would do through the ABC control rule amendment, but it's not something that we would necessarily do right here, but, like I was saying, it was like I don't think you need to go through that at this point, because I believe you're in a better position of just directly recommending an ABC, for all the reasons that you've talked about, and I think that's fine, but I think you're on more solid footing if you say we've applied this and this is the rule we have to work with, and it is not performing the way that we would like it to perform in this situation, and I think the Magnuson Act is pretty clear that you can deviate and just pick another number, based on your expert judgment, after all of this discussion.

DR. NESSLAGE: I am wondering what the PSEs are in recent years for scamp, and I guess I'm wondering that because, if we think 200,000 is our ad hoc number, can we give it a buffer based on the PSEs, and maybe the PSEs are 50 percent, and then we make it -- What would that make it? 300,000, right? Just to account for the uncertainty in MRIP, but also get closer to our gut instinct of 200,000, and I don't know, something like that, but maybe the PSEs are low, and I have no idea what they are, and so I'm saying this with being completely uneducated.

DR. SEDBERRY: That is a good suggestion. Can we find out that number?

DR. SERCHUK: Clearly the approach that we've had for this stock is no longer appropriate. the reference period is no longer appropriate, and I think that, in itself, is sufficient to say that the method hasn't worked, and, rather than trying, as an interim measure, to try to make this ORCS method work, I think it's torqueing it, quite frankly, because we know we have a stock assessment coming up, and all we're basically saying is we think the stock assessment will provide the most recent evaluation from which to set future OFLs and ABCs for the stock, and then to try to use some common sense in coming up with a number that we think will prevent overfishing, and I am just thinking that we're trying to use two things.

We're trying to save the method that we have, because it's a generic method, and that method no longer works for this stock, and we have independent measures that show that stock productivity is very much less than it was during the reference period, and so I understand that we want to change values and so on and so forth, and I think that's trying to provide a justification that we really don't need to provide, and I think it's going to confuse the issue, for me. That's my personal opinion.

DR. ERRIGO: I've got them. If you want to start from 2014, that datapoint actually has a PSE of 95.7 percent. In 2015, it's 61 percent. In 2016, it's forty-six-and-a-half percent. In 2017, it's 39 percent, and, in 2018, it's 58 percent. They're pretty up there.

MR. CARMICHAEL: Genny had stepped out. Do you want to repeat all of those for Genny, now that she's back? They were 90 to 50 percent, I think. The first year was 90, and then they get a little bit better, but you're right that they are high, and so I think making some adjustments there might be a good argument.

DR. REICHERT: Not using that 90 percent, the average is about 50 or 51 percent.

MR. CARMICHAEL: I mean, you could say 300,000 as an ABC and then recommend the council consider 200,000 as an ACL, based on that being the average.

DR. SEDBERRY: That sounds very reasonable.

DR. REICHERT: Plus, I think we have a little more than just saying let's take 300,000, which was the point that I made initially when Fred made his recommendation, which I don't necessarily disagree on, but I am comfortable with this.

DR. SERCHUK: The 200,000 is really the average of about the past six or seven years of catches, quite frankly. It's a declining trend, and my point simply was to get a much lower number and to take cognizance of the fishery-independent measures and not to constrain the fishery, and the most recent values have all been below 200,000, and my idea was not to constrain the fishery, because we're having an assessment coming out in a couple of years, and that was really my rationale.

I hate to go back and look how the NFL game turned out on Sunday and then go back and say, well, if they did this or they did, we'll have the justification, and I think that is Monday morning quarterbacking for the Sunday games, and that's why I have tried to stay away from tweaking this rule. Thank you.

DR. AHRENS: I think, if they do achieve 200,000, with a PSE of 50 percent, that would give them a 15 percent probability of going over 300,000 in a given year. I used a calculator for that.

DR. SEDBERRY: Well, that sounds good to me.

DR. ERRIGO: So the recommendation is an ABC of 300,000 pounds whole weight.

DR. SEDBERRY: And suggestion of the ACL at 200,000.

MR. CARMICHAEL: The council consider.

DR. SEDBERRY: Yes, that the council consider. I think we still need to get in the words there somewhere that we realize that there is a research track assessment underway and that this would be an interim measure to deal with this situation.

MR. CARMICHAEL: You can cite that 50 percent PSE that you looked at as saying that you recognize that, and, being a recreational fishery, that can have an impact, and that's why you think the ABC could be set a big higher than where you really think the fishery should be targeting, which is what the ACL is kind of getting at, and Fred's discussion about trying to maintain the fishery at that level, and then you have the benefit of, if for some reason there is a good year class while this assessment is underway, you will have some protection for those fish.

DR. SEDBERRY: Okay. Does everybody like what we've got up there? While Mike is typing, we can consider what we want to do. This ABC control rule discussion was our one item for today, which we had hoped to finish, so that we could start tomorrow with something else, and we're not going to finish, but we could -- We've got another thirty minutes or so, twenty minutes, and we could try and pick something easy to knock out, although it's hard to predict what those might be.

DR. ERRIGO: I would say as long as we don't do the jacks complex that we might be okay, or black grouper.

DR. SEDBERRY: Let's make sure that we're done with scamp. I think so. Again, we can edit this a little bit. Let's look at the deepwater complex.

DR. ERRIGO: There is a whole bunch of species in there.

DR. SEDBERRY: You're right. There is a whole bunch of species.

DR. ERRIGO: But that's fine. Most of the species in the deepwater complex look like this, almost no difference between the two time series, as you can see. It's because the landings are tiny, and intercepts are very low. The one with the biggest difference is sand tilefish, and that one is seen more than the other species.

DR. CROSSON: By the nature of these being deepwater species, these are mostly commercially caught.

DR. ERRIGO: These are mostly not caught. Silk snapper, there is some.

DR. CROSSON: I see. You're right.

DR. ERRIGO: Other than that, there is hardly any landings at all.

DR. REICHERT: Remind me. For yellowedge grouper, there wasn't a lot of change in the total old and total new, but there's a huge change in the old and the new ABC, and so remind me why that was again.

DR. ERRIGO: Because the highest landings point -- This one point is significantly different.

DR. REICHERT: Thanks, but then, in addition to that, we recommended this, and there's a couple of species that we, as a working group, recommended for ecosystem components.

DR. SEDBERRY: So an ecosystem component is not targeted? I have forgotten the --

DR. ERRIGO: Ecosystem component species don't have ABCs or ACLs.

MS. LANGE: What other criteria are there for us being able to assign them to ecosystem component? I mean, is there a specific -- Is there something we can check off?

DR. ERRIGO: As long as you think that the landings, or whatever the fishing pressure is on that species, will have very little to no effect on the population dynamics of the stock, and that it's just -- It's basically bycatch species, and mostly people don't keep them, or aren't concerned about them. If they are landed a lot, if they are targeted, that would not be a good species for ecosystem component. If they're just occasionally encountered, someone might bring one home, like he was on vacation and was like, oh, I caught a fish and they bring it in, and that's an ecosystem component species.

DR. SEDBERRY: I think the criteria are reviewed in the background documents that are in the briefing book regarding frigate mackerel and bullet mackerel, if you want to get into the nitty-gritty.

DR. GRIMES: Most of these are really Caribbean species, and they're not particularly abundant in the South Atlantic Bight. Maybe down in the Keys somewhere, in south Florida, but --

DR. ERRIGO: Yes, most of these species are not caught heavily in the South Atlantic, and they occur -- Like queen snapper.

DR. GRIMES: Yes, and you catch the occasional one.

DR. ERRIGO: They are very occasional here, but they are caught a lot more like from the Keys south and into the Caribbean, yes.

DR. SEDBERRY: Blackfin snapper, I think, are caught quite regularly off of North Carolina. Sand tilefish are everywhere, but nobody really catches them. Nobody targets sand tilefish probably north of the Caribbean, and so, yes, I think you're right.

DR. ERRIGO: Marcel, there is another reason why these two points are extremely different, and so there have been changes to the MRIP data series over the years, and the original data series used to calculate the ABC didn't look exactly like this, because the highest landings in that time series was the point 2000, and, as you can see, there are now at least two points that are higher than that, and so that's why.

DR. REICHERT: So this is the new old series, and it's not the old old series?

DR. ERRIGO: Yes, it is.

DR. REICHERT: Thank you. That explains it.

DR. SEDBERRY: I guess the recommendations that came out of the working group for these species are some have been recommended for ecosystem components, and that's the recommendation that we make to the council, and we don't do that.

DR. ERRIGO: Yes, you would have to make it to the council, and the council would have to put it into an amendment, and that would have to be approved, and then it would have to be approved by the Secretary of Commerce. All those things are very iffy, and it sometimes depends, but --

DR. REICHERT: For clarification, we still need to make ABC recommendations, and, in addition to that, we can, as an SSC, recommend to consider those species for ecosystem components, and so that recommendation doesn't preclude -- That doesn't mean that we don't have to make an ABC recommendation, but it's just as a clarification.

DR. ERRIGO: My understanding, from the workgroup, was that those that were recommended for ecosystem components, based on the notes, like trend generally the same, with low landings, was that just to use the previous methodology, with the same reference period to calculate the ABC.

DR. SCHUELLER: As I look at these figures on this tab, queen snapper and sand tilefish were not recommended as ecosystem components, while all of the others were, and I'm still not clear how those recommendations were come to and why those two species were not while the others were, and I guess I'm not onboard the ecosystem component recommendations right now, because I don't understand them, and I don't understand why they have been put forth.

DR. SEDBERRY: I am a little confused by that myself, and when I think back about us considering bullet mackerel and frigate mackerel as ecosystem components, I see that, but I don't see how some of those criteria apply to these species at all.

DR. SCHUELLER: Aren't there several species that are already ecosystem components, and so it would be nice to have some background on -- Before the SSC makes a formal recommendation, I think that the SSC should get more background on which species are already ecosystem components and how they became that, et cetera, et cetera. I don't think this is a trivial recommendation or task.

MR. HADLEY: We will, obviously, get into the discussion of ecosystem component species with bullet and frigate mackerel, but there is a list of ten factors within Magnuson, where species should be considered -- Whether or not conservation and management is appropriate and necessary, and so the way I believe this process would work, if the SSC made that recommendation, is the council would still have to work through that ten-step process and then work with the agency, as far as whether or not those species could be moved over to ecosystem component status, and I don't have that list in front of me right now, but we will be going over that, and that's essentially the process. We would go through that ten-step list and see how it applies to each one of the species.

DR. SCHUELLER: It just seems to me that we should perhaps do that before we -- Have you do that, if that makes sense. I mean, if we go through the list, and we're like, oh, clearly, this doesn't fit, then we shouldn't be recommending for you guys to do that work either.

DR. SEDBERRY: The ecosystem species recommendation is really not one of our action items for this particular agenda item, and so I don't know that we -- I agree with you that we shouldn't just go and rush through this. I think this is going to take some consideration before we make a scientific recommendation that these be considered ecosystem components, although I'm sure that the workgroup did their homework on this, and I just don't know that I'm ready to act on it at this point without more background information.

MS. LANGE: Some of them, it's fairly clear, where the maximum that you've seen is 4,500 pounds in a year, but others are up over 100,000 that are listed for that, and I guess I am just curious, again, where the break point would be, or up to 100,000, and I guess the yellowedge grouper versus the misty, and so I think a little further discussion would be appropriate.

DR. REICHERT: I agree with that, but, Scott, remind me. Wasn't that a request for a terms of reference of the working group, to look at species and indicate whether some of them could potentially be considered as ecosystem species? That's why we ended up making the recommendation in the first place.

DR. ERRIGO: I believe that it was.

DR. REICHERT: So it was a council request for us to look at that.

DR. ERRIGO: I don't remember if it was from the council or if the workgroup. Well, the workgroup came up with the terms of reference and sent them to the council for review, and was that this workgroup? I can't remember. No, maybe not. Sorry.

DR. REICHERT: Anyway, I want to clarify that that was a request -- Those were recommendations that didn't originate within the working group, and the reason that I am mentioning that is because, if that's the case, at some point, that request may come back to the SSC, and, because of that, I completely agree with Amy and others that we may want to set some time aside to look at the criteria before we can make that recommendation, to solidify those recommendations, but I think the working group was -- The way I looked at it, it was a first step to address some of the requests or a term of reference.

MR. CARMICHAEL: Shep has been listening in online, and he said that ecosystem components will take some time and quite a bit of effort, and it would be good to recommend the ABCs now. Otherwise, they're still going to be tied -- Still in place and tied back to the old pre-MRIP revisions, and so you can do the ABC, and then, if you want to talk and maybe set aside some time to look at ecosystem components broadly, that would be good.

DR. ERRIGO: I think that's a good idea, and, this way, it will save discussion here, which will be good.

DR. SEDBERRY: I agree, and maybe we can do the ecosystem component discussion as a webinar, or even bring it up in a future meeting, yes.

MR. POLAND: I just wanted to kind of echo what John said. I mean, certainly, we would appreciate an ABC recommendation on all these species, and then for you guys, as our Scientific and Statistical Committee, to also provide us a recommendation, at some point, on ecosystem

component status of these species and if you feel like that these species meet that ecosystem component, or rather are better suited as ecosystem component, because they don't meet those ten standards of a managed species, but, certainly, in the short term, we still manage these species, and they're in the complex, and we need an ABC moving forward.

DR. SEDBERRY: Thanks, Steve, and so our action items for these unassessed stocks are determining if the time series is the same.

DR. ERRIGO: The same as all the other species.

DR. SEDBERRY: Are the time series for calculating ABCs still appropriate? Does anybody have any feelings about the time series?

DR. ERRIGO: Basically, do you think we should just recalculate the ABC using the same methodologies that we used before?

DR. SEDBERRY: Exactly.

DR. ERRIGO: Like I showed, for most of these species, there is almost no difference between the old data stream and the new data stream, for most of them. Some of them, like sand tilefish, there's a bit of a difference, but like silk snapper and misty grouper and queen snapper, there is almost no change.

DR. SEDBERRY: Does the SSC as a whole agree that the time series -- Okay. I see thumbs-up everywhere, or at least from Genny. I don't see anybody disagreeing. I don't know, but was there a recommendation to form a workgroup to look at the ecosystem designation, or are we going to do that via webinar?

DR. REICHERT: I don't think there was a formal recommendation from the working group. My recollection is that was one of our terms of reference or one of the questions that was asked of the workgroup, to identify any of these species that we could potentially recommend as an SSC, not necessarily now, but at some point as an ecosystem component, and so I think it was basically a first step to get that conversation going.

DR. CROSSON: Yes, that's exactly it. We weren't told to do anything beyond that. It was just note it as we went through.

DR. SEDBERRY: Well, let's sleep on this, and maybe we can think about it overnight, and council staff might be able to give us some guidance that we can look at in the morning and see what the next step would be in this ecosystem component part of this review.

At this point, before I forget, I would like to ask if there is any public comment, in general on the proceedings for today or on this particular agenda item. Even though we're not finished with ABC, we need to take public comment, because it is the end of the day, and I just want to make sure that the public has a chance to comment if they wish to. All right. Very good. There is no public comment, and so I think we are done with the deepwater complex, and we've agreed on that, and we still have a few more species or species groups to review, but it is late in the day, and I know

that this is going to put us behind, but I am going to propose that we recess for the day and take this up tomorrow at eight o'clock.

DR. ERRIGO: That's cool, but let me just say that I think there is flexibility built into the agenda already. A lot of those agenda items will be very, very short.

DR. SEDBERRY: Okay. Well, we can save that eight o'clock startup for Thursday then, if we need it.

DR. CROSSON: The SEDAR activities can't take very long, and the second agenda item from tomorrow is the National Standard 1 Guidelines, and Dan Holland is on the west coast, and so he's not going to be presenting that thing particularly early tomorrow.

DR. SEDBERRY: So we may as well start at 8:30.

DR. CROSSON: We have some time to deal with this tomorrow morning, and 8:30 is reasonable.

DR. SEDBERRY: Does anybody object to 8:30, versus eight o'clock? No objections. All right. We are recessed for today, and so I will see you tomorrow at 8:30, if not before.

(Whereupon, the meeting recessed on October 15, 2019.)

- - -

October 16, 2019

WEDNESDAY MORNING SESSION

- - -

The Scientific and Statistical Committee of the South Atlantic Fishery Management Council reconvened at the Crowne Plaza, North Charleston, South Carolina, on Wednesday, October 16, 2019, and was called to order by Dr. George Sedberry.

DR. SEDBERRY: Welcome back to day two of the fall SSC meeting. We left off yesterday and we were still working on ABCs for unassessed species, and we're going to continue with that today, but, before we get started, we had, overnight, a couple of SSC members that have joined us who were not here yesterday, and so I would like Fred and Chris to introduce themselves, and so we'll have a voice recognition for the minutes.

DR. SCHARF: Fred Scharf, UNC Wilmington.

DR. DUMAS: Chris Dumas, and I'm an economist from UNC Wilmington.

DR. SEDBERRY: Thank you. I believe we're all set. What are we going to start with this morning, Mike? Something simple and --

DR. ERRIGO: Something exciting. I figured we would start with the snappers complex. I am going to leave some of the more discussion-intense species for the end, and we'll hopefully get through some of these fairly quickly. What I did overnight, and hopefully it uploaded to the server, was I put -- If there was a MARMAP trend, I put it in here. There aren't for any of these species, but, for snappers, we have gray snapper, lane snapper, and cubera snapper, and so we'll start with gray snapper.

The workgroup had this to say, that the trends are similar until about 2012, and then they diverge, and there's a steep increase in landings after that, and the magnitude is higher in the new landings, and so they suggested looking at that trend, to see what was going on, and it's just an artifact of the calibration, and I'm not exactly sure what is specifically causing each point to be expanded so large, but it is an effect of the calibration.

Let's walk through each species, and then we can -- If we have anything to say about any of them, we will do that. Lane snapper is here, and the new landings are basically shifted up across the entire time series, and it's significantly higher in many of the years, but the magnitude and the reference period is similar to the magnitude in the recent years, and so the workgroup felt that we could use the original methodology and the original reference period to come up with the -- To recalculate the ABC.

Then cubera is actually a rare-event, and the trend is generally the same. This weird spikiness is -- The points are higher for the new data, but, all in all, it's kind of the same, and I'm not sure why 2017 zipped up like that, and I think, because it's rare event, depending on where these intercepts occurred, it just was expanded that way, and so this is one that they had said that it might be considered for ecosystem component species, but they didn't see any issues with using the original methodology for recalculating the ABC.

DR. SEDBERRY: So the workgroup recommended using the original methodology and the original reference time period. Is there any disagreement with that among other members of the SSC?

DR. ERRIGO: I don't know if anyone has any knowledge about gray snapper and if they know if there's any changes in the fishery that might have caused the increases in recent years or anything. It's more of a Florida species, and so there is very -- I don't think there's anything in the chevron trap information, and there wasn't a trend for me to pull. Otherwise, I don't know what to suggest for that.

DR. BUCKEL: I think that one of the things that we talked about was the new MRIP -- How the shore mode really jumped and that we wanted to get input from folks from Florida if this species could be caught in the shore mode, and that might lead to these large increases in recent years.

DR. SEDBERRY: I suspect that's probably part of it, because this is something that's caught off of every dock and bridge and canal, and so is the same thing happening in the Gulf? Do you know?

DR. ERRIGO: I actually don't know, and I haven't seen any of the Gulf data.

DR. SERCHUK: If I read the graph correctly, it looks like the landings in the last two years would be above the new ABC and ACL, and is that correct?

DR. ERRIGO: Yes, that is correct.

DR. SERCHUK: Is that troubling to anyone, because the previous one indicated, except for a couple of years, which were about the ABC and ACL, they've been under the ABC and ACL, and so is that causing anybody any heartache? In other words, the black line there, which is the old ABC and ACL -- Basically, the landings were always below that, or about that level, but now they indicate that the fishery is higher than the new ABC and ACL. Am I reading that correctly?

DR. ERRIGO: Yes, absolutely.

DR. SERCHUK: I am wondering whether that causes anybody any agita, or will cause anybody agita in the future, and the question is -- I have no knowledge of this fishery, but I'm just wondering if people are ready to react if that trend continues. Thank you.

DR. CROSSON: It doesn't look truly exciting, but the Gulf Council did just do an action, a reef amendment, on gray snapper specifically, and so I just sent around the little notice that's on the thing, and I mean like this past month or the month before.

DR. DUMAS: Would it be reasonable to assume that, if the recent increase reflected an increase in the stock size, that we would see increases in both the commercial and the new recreational landings, but, really, that large increase only appears in the recreational and not the commercial, and so, if this increase was due to an improvement in the stock size, you would expect to see, I would guess, increased commercial catches as well, similar, and there's a small increase in the commercial catch, but nothing like the increase in the total catch.

That might mean that those recent increases are perhaps not due to a change in stock size, but due to a change in the recreational fishery, and a change in the recreational fishery that's not due to the new methodology, because the new methodology was tracking somewhat higher, but not dramatically higher, than the old methodology up until 2012. The dramatic increase since 2012 might not be due to the change in methodology, and it might not be due to a change in the stock, and so it might be due to a change in the recreational fishery, is what I'm saying. If it's not due to a change in stock size, then are we justified in increasing the ABC and ACL?

DR. CROSSON: Is this one of those species that is -- I don't know this fish. Is this one of those ones that is caught off of docks and structures? Okay, and we know, from our August meeting and the MRIP, those numbers are particularly going to be inflated, because that's the biggest increase, are those private dock landings.

DR. ERRIGO: That is correct. However, the increase in the shore mode should have happened across the time series and not just the -- The higher increase in the larger years was caused by the mobile effect, but that actually started before -- This jump is in 2013, and the mobile effect started earlier than that, and it was more gradual.

DR. DUMAS: But is the time series calibrated all the way back, and is that correct, for the change in methodology? Whatever that mobile effect would be, it should be incorporated in the whole time series, and is that correct?

DR. ERRIGO: Yes, this is fully calibrated, which means that that jump like that may not be due to just the calibration.

DR. SHAROV: I just would like to bring back the discussion from yesterday on the fact of the average weight calculation and converting numbers into weight, and this looks very much like what so many graphs we saw yesterday, and I bet it would be really useful, in the cases where the total harvest is primarily recreational, to look into the plots of the catch by numbers, and that would eliminate that discussion of weight, to some degree, and it would really help to figure out what's what, what's causing it.

Comparing these two graphs that are calculated backwards to 1986, just judging on the ratio for most of the time series, like the old one is under the ABC, and yet -- If it was just calibration, you would expect it to be closer to the purple one, but below as well, and so these additional high peaks are very likely to be the result of the recalculation of the weights, and I don't know, and it's just a speculation, but it's reasonable when compared to what we talked about yesterday.

DR. AHRENS: Alexei, if you look at the numbers coming out of the MRIP estimates, those are bouncing around a fair bit, and so, if you look at the 2013, it's 9.4 million, 10.6, 8.3, 15.7, 13.7, eleven, in the most MRIP years. The PSEs on those estimates are around 15 percent. The percent standard error is around 15 percent.

DR. NESSLAGE: The notice from the Gulf that Scott just circulated indicated that gray snapper in the Gulf are overfished and overfishing, if I'm reading that correctly, and is it possible that there's a shift in effort down to Florida or something like that that might be driving people to go fishing on the South Atlantic side for them?

DR. ERRIGO: If that's true, then they would have to shift from Monroe County to Miami-Dade County and not from one side of the Keys to the other, just so you know, because, since this is unassessed, we don't take any of the Monroe County landings.

DR. SCHARF: Just looking at the document that Scott sent, it seemed like they just set the criteria for determining overfished and overfishing status, and I don't think they said they were overfished or overfishing, and it says that they set the status determination criteria that defined the thresholds, but I don't think they're saying that it's overfished or overfishing, right? That's the way I read it, but I wonder too about whether this increase in the last five or six years in gray snapper landings, because it's shore mode, may be potentially an effect of just the lack of availability of other species in the shore mode, and I know, from people that I know on the Gulf coast that tend to fish in that mode, the availability of red drum and snook and speckled trout, due to red tides and other things, particularly the last five or six years, they've been sort of shot down, and so, when I talk to them, they're always like, oh yeah, we caught a bunch of gray snapper, caught a bunch of gray snapper, and that's been going on for five or six years now, and so I wonder if that's part of the effect.

DR. CROSSON: The SEDAR website shows that SEDAR 51 was gray snapper in the Gulf of Mexico, and so it's been assessed recently in the Gulf, in 2018.

DR. ERRIGO: The question, I guess, that needs to be answered is do you think that the level of landings that happened like in 2016 and 2017 is sustainable for this stock or not? Do you think that where the new, recalculated ABC is is a good place for it to be and that those landings above

it probably are detrimental to the stock, or do you think that we need to do something else to increase that ABC recommendation, because the stock most likely can handle higher levels of exploitation?

MS. LANGE: I don't think we have enough information or enough years of data to suggest that we should increase it.

DR. SEDBERRY: I think you're right. It's the same kind of situation that we were talking about yesterday for whatever species it was.

DR. NESSLAGE: Thanks to Scott. Again, this SEDAR 51 seems to indicate, on the Gulf side, they are undergoing overfishing, but they aren't overfished, and they have been overfishing since 1976.

MS. MCCAWLEY: On the Gulf side, it's my understanding that, with the old benchmarks, they were considered overfished and undergoing overfishing, but the Gulf Council just changed a number of benchmarks, and so they are not, with the new benchmarks, overfished or undergoing overfishing on the Gulf side.

DR. SEDBERRY: That must be really recent, because I am looking at the June 30 stock status, and it has it as undergoing overfishing in the Gulf.

MS. MCCAWLEY: I'm not certain when the change took place, but, yes, it was recently. I can go over here and look at some of the Gulf Council actions and come back with an exact date of when that was changed.

DR. SEDBERRY: Well, I think, in my opinion, the catches now are above the ABC, and so there needs to be some adjustment made, and they have been for the last several years.

DR. ERRIGO: Remember that we've been here, and they haven't been, and so, if we go here, then what will happen is we'll start tracking based on this, and we'll close the fishery if it starts to get here. We haven't been constraining the fishery to these levels, based on these landings.

DR. SERCHUK: I am just wondering what is the latest datapoint on that graph, and is that 2017 or 2018?

DR. ERRIGO: It's 2017.

DR. SERCHUK: 2017. So here's my suggestion, and, again, it's just a commonsense approach. Once the 2018 data are available, and if they are still above that line, then I would think that would be a sufficient amount of information to say, wait a second, this is above our approach of the standard approach we have, and some action needs to take place.

This thing has been bouncing around, but, because we know very little about it, this is the reason we've taken this approach, and I would wait until the 2018 data became available, and, if it has dropped below that line, that would be fine, but, if it's still above it, then I think it would give an indication to me that overfishing is taking place, from a pragmatic point of view, giving management some time to think about this, because I don't know about that, but this is a large

fishery, and, if you're 50 percent above where the ABC is, then I think that's a significant amount to be over. Anyway, that's a proposal that I throw out to the SSC to think about.

DR. CROSSON: I don't disagree. First of all, I think it sounds like there's not much disagreement with using this new ABC number, and so it's probably a fairly -- The Gulf publication of the newest announcement, and I guess probably the SEDAR, if I had time to read the whole thing, would show that at least the stock is fairly resilient, right?

I mean, if it's caught off of docks and structures like that, then the discard mortality is probably not as bad as it is for a lot of other reef fish, and so, if we set this new ABC, then, yes, the council is going to have to start looking if we have a lot of these landings, but I think, for time being, for what we're tasked with right now, does anybody disagree with using the new ABC that's set her by the purple line and then make a recommendation to the council for tracking this?

DR. SEDBERRY: I am not seeing any disagreement with that.

DR. CROSSON: Then let's do that and go to another species.

DR. AHRENS: Just to go back to the MRIP, the datapoint in 2014 is 10,687,000, and the 2018 datapoint is, assuming the mean weights are the same, is 11,090,000. These are the numbers, and I am querying the MRIP database here, and so these are the numbers and not the weights. If you go back to the 2014 datapoint on there, it would suggest that the 2018 would be coming in reasonably close to that value.

DR. SHAROV: Following Rob, I just looked at the MRIP plots for numbers in weight, and, generally, it seems that there was a jump as of 2013, and the numbers were statistically significantly higher than the previous time series, but the PSEs were pretty tight, and so there was an increase in total removals, B plus B1 harvest, from 2013 through 2018, and the 2018 is a little above, and I think it would be instructive for our group to see it, maybe, and that will sort of help you to interpret this.

The significant increase over the period of five years or so, we need some additional information to make a judgment about what has caused the -- Logically, I don't see why, with the effort increase that significantly, considering this is sort of a ubiquitous species that is everywhere, around docks and whatever-- This could be a spike in abundance, but, looking at the whole time series of the catch, it doesn't seem that it was a prolonged period of increased abundance in the past. There are some, but they're a smaller scale, and so there are essentially two options.

I thought that maybe just the uncertainty is possibly a reason, but the PSEs are tight. Even for those high numbers, they are tight, and so they certainly tell you that landings, estimated landings, starting from 2013 are much higher than before, and they are statistically significant, those differences. They are not a result of them being high by a chance, and so it's either an increase in population abundance or an increase in effort, and I am not aware of anything that in particular would force people to go to docks and whatever and try to triple their effort in catching gray snapper, but, truly, we need some extra information to make a judgment, but it seems that it has been declining for the last three or our four years, based on the MRIP information, and, looking at the whole time series, it would seem to me that it makes more sense to stay with the previous

definition of the previous levels of ABCs, like Anne suggested. If you would bring on the screen that graph, maybe that would help everybody.

DR. ERRIGO: I'm sorry, but which graph was that?

DR. SHAROV: I am sorry, but the MRIP query, and just do the live query for gray snapper, B plus B1, first numbers and then weights, and you will see what it looks like.

DR. ERRIGO: Yes, and the MRIP data has been available for quite some time for 2018, and the issue -- The reason why it's not on these graphs is because the commercial data, the headboat data, and the Science Center converted weight data is not available for 2018 yet, to me anyway, and so that's why it's not on this graph, because the MRIP data is not comparable to this, but I can pull that up if people would like to see it.

DR. SEDBERRY: Alexei, you suggested that we stick with the old ABC?

DR. SHAROV: Yes. The logic for this is that there was a temporal increase in abundance, but, again, just graphically, it looks like this dome-shaped period for four or five years is ending, and it's trending down, and it's returning to generally the range where it used to be for like thirty years in a row, and, therefore -- We have missed already -- It was a real bump, we have already missed it, and we're at sort of a time back to normal.

DR. SCHUELLER: I was just thinking to myself that, if the Gulf has an assessment for this, it seems like it behooves the SEDAR schedule to put this on the schedule, and we may or may not be able to do age-structured, and I don't know what they did for the Gulf, but that doesn't mean -- I was thinking, over the course of this, there is several of these species that could probably benefit from some sort of data-limited exploration for assessments, and I know the Gulf did a suite of species recently, and it seems like we could probably offer up a suite of species for the South Atlantic as well.

DR. SERCHUK: The intervention I am making now is to compare what you have put up on the screen to what Alexei was referring to, because Alexei has going through the first three waves of 2019, and it shows a precipitous drop for those three waves. Now, I don't know whether the fishery is more active in the latter half of the year, when most of the landings occur, and so two things now. I said let's wait until 2018, and you have the 2018 here, and they are still above the new ABC. Alexei shows that precipitous drop, and I don't know why we can't get the first three waves, as Alexei has.

DR. ERRIGO: I can pull up the first three waves of 2019, but, unless I do a wave-by-wave comparison, they are not directly comparable. These are annual estimates.

DR. SERCHUK: I understand that, but that's what I am asking, for those people that may be familiar with the fishery, is the fishery more active in the latter part of the year or not, because the little flag that I was raising to management in my intervention, which was just that, is, if the trend that we see in the first waves of 2019 is carried through for the rest, it will drop below this ABC.

Now, that could indicate that things have really gotten bad, or effort has really shifted, but it will be below this ABC that we're talking about, and so that is the reason that I raised this point. I

don't want to be an alarmist, to say, okay, council, your 2018 data are in, and it's still above the ABC, and it's been above the ABC now for the several years and you might want to do something, when the 2019 data come it's far below it, and so I think that's the only reason that I am raising this issue now about having half of the year in 2019 showing a very different trend than we had seen in the previous two or three years for the entire year. Thank you.

DR. SEDBERRY: That's just for the recreational.

DR. ERRIGO: There are two things. One is, by the time this is implemented, we most likely will have all of 2019 data available, and the second is I can do a wave-by-wave comparison, to see how Waves 1, 2, and 3 stack up from 2019 to previous years and how similar they are, to see if 2019 is on par with the last three years, or is it higher, or is it lower.

DR. AHRENS: Just to note that Wave 4 is much higher than Waves 1, 2, and 3, by an order of magnitude.

DR. SEDBERRY: So we really can't do anything with the 2019 data until we see what the rest of the year brings.

DR. SHAROV: You could do cumulative through the number of waves that you select, and you could do Waves 1 through 3 and compare the time series of your catch over the first three waves. Of course, they are not going to tell you what happens in the second half of the year, but, if the changes are due to mostly changes in abundance, you could view this information for the first three -- As a reflection of changes in abundance, and maybe sometimes effort, where it still gives you relative changes in time, which, again, suggests an increase in the catch in those three waves and consistently high catch starting with 2013. Is this the result of the change in the assessment methodology or a real one, reflecting change in abundance? It's really hard to say, but at least it's consistent in the course of like six years.

DR. SEDBERRY: Okay, and so Mike is bringing up the graphs by wave for the first three waves of the year, first two or three.

DR. ERRIGO: It's not letting me choose 2019 when I do it by wave or cumulative. It's not letting me, and I don't know if it's this computer is not updating the drop-down menu, and I don't know.

DR. DUMAS: As I said earlier, a point of evidence against a change in abundance is that, if you just graph the commercial catches over time, there has really been no change in commercial landings since 2004, and so, if there really was a large increase in abundance, you would think that you might see some increase in the commercial catches as well, but you don't, and so that would argue against -- That's a point argument against a change in abundance and arguing for a change in effort on the recreational side somehow. If there's been no change in abundance, then I would think that we might want to stick with the old ABCs rather than go to the new ABCs.

That is assuming that the commercial fishery has been operating relatively the same way over that point in time, but my understanding is that this is not a directed commercial fishery for gray snapper, and so they are just being caught incidentally, and so, if the gray snapper abundance were increasing, you would expect to see increased incidental catch of gray snapper in the commercial fishery, but we don't, and so that's a point against an increase in abundance of gray snapper.

DR. SEDBERRY: I don't know if the commercial landings are constrained by regulations, and I just don't know.

DR. NESSLAGE: To confuse things and make a counterpoint, if the Gulf has any relevance to the South Atlantic, there were several, three or four, fishery-independent surveys done inshore, and not the farther offshore, but the inshore ones in the latest SEDAR for Gulf of Mexico gray snapper all have that spike at the end, and it looks like they are experiencing some sort of recruitment pulse that's coming through, and it looks like the fishery is responding, and I have no idea if that's what is going on on the east coast as well, but, if that's the case, this could just be shore mode folks taking advantage of a recruitment pulse coming through, and I don't know how the commercial fishery operates, but they might not be that close to inshore, and therefore may not be seeing that, and I'm making a just-so story here, but it's something to think about.

DR. AHRENS: If you look at the plots that Mike has pulled up, the big peaks are Wave 4.

DR. BUCKEL: We dealt with the change in the methodology and that it's calibrated, but I think, looking at these, and we can go back to some, it seems like there is several species, as has been mentioned already, that these spikes have occurred in the latter years, and I just went back through the MRIP calibration slides, and that 2013 forward is when they had the solid data, the MRIP APAIS, and then, before 2013, they had to do the modeling to do the calibration, and so it's concerning that you see the jump in 2013, which is the same year when the survey switched over, and so, when we look at the other species -- I am not saying that that's what is going on here, because we said the calibration is okay, but maybe for some species where there is a shore mode effect or the calibration is not doing a good job before 2013, and so something to keep an eye on for the other species as well, but I am still not sold that the calibration, given that this jumps right in 2013, that it's fully taking everything into account.

MR. CARMICHAEL: It seems like we don't have a lot of data here to really go on, and Amy had mentioned earlier that this stock may need some more look, and I think, rather than trying to sort of go down and try to pull something out of some information which may not be complete, and you don't have all of the landings information, and you only have the recreational, and we have concerns about the recreational, and we're here because of changes in the recreational magnitude, that all of that seems a little risky, to me.

I think it's a little bit of a problem, to me, to just say go with the old ABC, because the question is whether or not you update your ABC process to account for the new numbers in MRIP, and so I feel like, if you just went with the old ABC, then you're really not addressing that, and, to me, it's kind of a similar situation as we talked about with scamp yesterday, just with a different situation.

Apparently, here we're concerned because the landings have gone up and we're over those ABCs, and we had other stocks where we had concerns that the fishery wasn't able to reach the ABC. Now it sort of comes into how do you rectify those two things for the same response to entirely different data outcomes based on the little bit you have here, versus, if you're concerned about that spike and what it might be doing, and if the fishery is expanding, well, even if you update to the new MRIP data and the outcome of the ABC, you can see that the council has an issue to deal with, because their landings are over that ABC, and they're going to have to have some type of response, most likely.

If you feel like that would be too high, you could give the council some caveats or recommendations along that line and then ask for a more thorough evaluation of the commercial fishery, the trends in mean size, the trends in mean weight, maybe effort information, and I think this is largely centered in Florida, and they may have some more survey information from some of the work that they do that we just haven't looked at yet, because, as we said, we haven't assessed this.

When we went through applying the NMFS stock assessment improvement program in ranking stocks, gray snapper, at the time, wasn't even one that was selected to be ranked, and it wasn't considered that important in the fishery, and it may becoming more -- The next time we do that, we probably have to reconsider that, but I think it would be -- You guys would be better off by trying to maybe get some more data on this stock and really have some information to talk about, and I fear that, if we have a record that sort of wanders all around without data, we will probably have Shep getting very concerned about where this would end up.

DR. SERCHUK: I don't disagree with John's intervention. On the other hand, we have looked at other stocks, and, when they've been below, we'll said we'll accept it. I raised this issue here because it's above, and, based on the information that I know that we have for 2018, it's also going to be above in 2018, and so that's three years that it's above.

I don't know about 2019, and we don't have it fully, but my concern now is that we have used a similar approach for other stocks, and we come to this one, where we know that, under the new ABC for the time period, it's going to be over for three years, and so, in any other case, if we used the new ABC and we saw something above it for two years after, there would be some action that would need to be taking place, and I'm not saying that the action would be, okay, we have to reduce it. The action might be we need more of an assessment, but these are data-poor stocks, in a relative sense. That's why we're using this type of approach, an ORCS approach.

I just was -- I want to be consistent in how we've approached these things using this methodology, and, in this case, we know that, for three years, two years on the graph, but we know that, when the 2018 data are in, that we're going to be three years above the new ABC, and I think that requires some propensity towards action, and I'm not saying what the action should be, but some propensity towards action, because it's above an ABC control rule that we have used in all these other stocks. Thank you.

MR. CARMICHAEL: I absolutely agree with you, Fred, and I will point out -- So bear in mind that this is a bit of Monday morning quarterback, as you mentioned yesterday, because we're now looking back at what would have happened if we had the new MRIP numbers and had this new ABC. If you look at the blue and the black, you can see that we weren't over, and so the council didn't have any reason to look at this and take a response that's different than the one we talked about yesterday, where they had the year over and then it went down, and so I would argue that, if you put in this ABC, and we look at those numbers and 2018 and 2019 are heading as they appear, I think the council will need to do something to deal with this, and this isn't a complex, but this is also the most abundant fish in this complex, and so it's going to have a big impact.

I think the action will come, but it will be a management action, and I guess that's the difference between an ABC action and a management action, but I think the council will have to be obligated

to do something about this, and I think you all's discussion about being concerned about the stock could help them with that.

DR. SCHUELLER: I was just going to say that, personally, I am fine with the new purple ABC, and I suspect management will do something in the future, and so point taken on John's, but I do think we should recommend that this get a further look, and so, basically, for the set of species we've been looking at in here, we have pretty much gone with the method, except for scamp, but we had other data available to have a fuller discussion, and so that's the one deviation. I am not ready to deviate here, because I don't think we have enough information to know. There's no weight of evidence, based on what we have, and so it seems like this should go on the SEDAR schedule.

DR. SEDBERRY: Yes, I agree, and that's a very good summary and recommendations.

DR. SHAROV: Real quick, I would like to correct myself. I misspoke when I said that there is no reason for additional actions and when I said that I am for the old one, and what I actually meant was the same methodology, staying with the ORCS methodology, and just -- That is based on the adjustments, what is called here the new ORCS, new stats for ORCS, and I guess what I was hearing, to what Fred was trying to say, is should we have some additional precautionary measures, and, in my mind, I didn't feel like there is a need for that one, because we have already passed that bump, but that ABC, whatever we have, certainly should include in it the correction in it for new scalars, where all the MRIP data were adjusted upwards, and I think that's obvious, and so, I misspoke, I apologize, and so I am in support of these new stats for ORCS used.

DR. SEDBERRY: I believe we are all in agreement with the time series and the methodology, with some recommendations regarding SEDAR and obtaining additional data and consideration of additional data for any future changes to the ABC, and, in the meanwhile, the council will -- Going with this ABC recommendation, they will monitor what's happening in the fishery and suggest regulatory changes if they are needed. I think that's where we are. Okay.

DR. ERRIGO: Just so I am clear, does everyone agree with just using the current methodologies that were used in the past for calculating the ABC with the new data for lane snapper and cubera snapper?

DR. SEDBERRY: These are, of course, much rarer species in the landings than gray snapper, and so we get kind of the weird peaks and spikes, but does anybody disagree with the time series methodology and the new ABC recommendation?

DR. SERCHUK: I am just wondering, under any of the methodologies, how can we get an ABC that is higher than any of the catches in the time series?

DR. ERRIGO: It has to do with the scalars.

DR. SERCHUK: I mean, I am ignorant about that, but could you just inform me about that?

DR. ERRIGO: It's the way the ORCS methodology is set up, and it has to do with the scalars, and so the risk of overfishing scalar takes the highest landing and scales it up, and then the risk tolerance scalar brings it back down, but sometimes it still stays high.

DR. SHAROV: The methodology is subjective, and that's what we get as a result, and we just have to --

DR. SERCHUK: Can I just respond to it, from a commonsense point of view? I understand that's what the methodology is, and so you're suggesting that catches could be 25 or 30 percent higher than they've ever been and still be within the ABC for a stock which we know very little about, and that's what the methodology may be, but I am not -- From a pragmatic point of view, I am wondering whether that would be the most precautionary thing to do. I am thinking, well, you might set it at a three-year high and so on and so forth, but to say that, on a stock we know nothing about, except for the catches, and using a methodology that we can go from 150,000 tons to more than double that and still be within the not overfishing seems to me a leap of faith.

I am just wondering -- We have the flexibility to look at our methodology, when it gives us an answer that seems beyond reason, and to modify that, and, in this case, I am little bit hesitant to recommend a catch limit, an ABC, that is significantly above the highest points in the time series. Now, if we want to be conformist, and that's what we want to do, that's fine, but I am a little bit wary of going that high for a stock in which the informational content is just the catches. Thank you, Chair.

DR. ERRIGO: I was just going to say that's an issue with the ORCS methodology, which hopefully we can fix in the ABC control rule amendment. The one issue I would have is that, as we go through these, you are just picking the ones you think look too high and not every one, not all of them, to readjust based on a methodology you think is sound, and then what's the criteria for readjusting? Is it when it's twice as high as the highest point, is it when it's twice as high as the most recent landings, or 1.5 times, and so I would say, if you want to address that issue, we should address it in the ABC control rule amendment, and it might be a little more straightforward that way, unless you think there's an issue with a stock.

If there's an issue with a stock, where that level of fishing, you are pretty sure, will be detrimental to a stock, then, yes, I would say you should adjust it, but, if there's no reason for concern, you have to be very careful about justifying why you changed it and how you changed it.

DR. SHAROV: I would have to agree with Fred, and I think he is not just a little bit concerned, but he is concerned, and I agree. I see that there is -- It's nobody's fault, but it's the actual testing in real life the ORCS methodology, and those methods, as they were developed, they were developed with good intent, but there was a bit of guessing and subjectivity in selecting probability levels, et cetera, et cetera, that result in this.

Now we know, and we have the actual testing of this on the ground, or actually on the water, and we see that, in many cases, it gives us weird results that are counterintuitive and against our knowledge of the interaction of stocks and the fishery, and so I think we have the flexibility to make a recommendation of some adjustment, because, in principle, the ORCS method is looking at the period of a stable fishery, where you think that you, in general, were in quasi-equilibrium and that you want to maintain that level of catch, given that level of the effort.

All we're do here, in principle, is adjusting the calculated average level of catch that we would want to call ABC to the scalar, because of the changes in MRIP estimates of harvest, and so it goes

up or it's -- But the method also brings in the calculation of using tolerance probabilities, the risks, et cetera, that we're not able to evaluate at this point whether this works well or not, but it doesn't make sense. I agree with Fred that it doesn't make sense that, given the principle that is behind the ORCS method, that we're setting the ABC at higher than everything that we've seen before, and so I don't know how much flexibility we have, but, at the very least, we should point at this and recommend additional work and changes through whatever process or make like on-the-spot recommendations for some sort of reasonable --

DR. BUCKEL: Alexei, you mentioned the reference periods and there's an equilibrium, and so this is when we went through and determined the risk of exploitation, and this was given a -- It was probably lightly exploited, and so that's why it has a scalar that allows for this higher ABC, and the reason is so it doesn't -- If there is a year where you get a spike, and so, right now, that's the low 300s that I've been seeing, and so, if it goes to 390,000, you don't want to trigger some management action, when it's probably not necessary, because it's not heavily exploited.

That is the reason, and it's just to avoid this triggering management when it's not necessary, and so, if folks know something about lane snapper that we got wrong -- Likes scamp, we went back and revisited it, and we should do that for lane, but the goal is just to prevent unnecessary management measures.

DR. SEDBERRY: That's a very good point, and I think this is really not a targeted species. It's probably caught more mixed with grunts than it is with other snappers, but there's a lack of information on that, I think, but I don't believe it is a targeted species, and I think your point about triggering management measures when they become necessary is a good one.

DR. JOHNSON: I was just going to say, along with Jeff's point as well, that we chose the largest catch to avoid some of those things, and, certainly in the species where the MRIP has really raised some of the top-level catches, that is going to exacerbate these ones where it raises it really high, because you're multiplying by that top catch and not over the reference period and not like the median or some other value, and you can see in this one where, during that reference period, there is one of those huge spikes that came up, and that's going to cause some of those issues as well.

DR. SEDBERRY: Fred and Alexei, does that make you feel better?

DR. SERCHUK: If that's the will of the committee, fine. I don't want to push a wet noodle. My feeling is that it's -- If we expect the fishery to more than double and be in the safe zone, if that's the will of the committee, fine. I am just pointing out that we don't have to be committed to a method where we're only using catch data. When we get results that are unrealistic, that because of the consistency of the methodology we accept it carte blanche. These are stocks in which we have very little ancillary data to change it, but, when I'm seeing something that says go to a catch level that is nearly 100,000 pounds beyond the highest catch, 400,000 versus around 300,000, I get concerned. That's all, but, if we want to go with consistency and we believe it's a lightly-exploited stock, I certainly would concur with the will of the committee.

DR. ERRIGO: The way that unassessed stock ABCs are supposed to work is so you set the ABC, and you're trying to keep the landings, the average landings, around what the average landings were from the reference period. If you see that average change, if it increases, you can go back at any point and say, oh look, this fishery has changed, the average has gone up, and this ABC is no

longer relevant, and we need to do something else, and then you can modify it accordingly, and so you can revisit things if the fishery changes, or for any kind of reason where data shows that there has been some kind of change. These are not set in stone.

DR. AHRENS: I think one is a recognition that there is a challenge with the ORCS method as a data-limited method, and I think that needs to be addressed in a revisiting of how you set ABCs for data-limited stocks, and I think there is also, for a number of these species, given a number of the research programs, there is growing additional information on them that can help inform interpretations of the catch trends and whether they are reasonable to set where they are, and so I think, moving forward, when those ABCs are revisited, then maybe some additional consideration should be given to what sources of information are being used to make those recommendations for the ABC.

DR. SHAROV: Thanks for the reminding and bringing the clarifying points about why the levels of the stock exploitation are entering the formula as well, and that should be counted for, I agree with, but I still think that we don't have sufficient information. I, for example, don't even know what is it based on, the assumption that it's moderately or lightly exploited, and are there any estimates of the fishing mortality rates or exploitation rates for these species and how far more we can push it, in terms of the fishing mortality rate and where it is.

Now, I don't know whether this fishery, recreational fishery, is limited in any way, and so how do we interpret sort of the bump that we talked about in the past five years, and I doubt that the effort has increased substantially. Therefore, it could be an increase in abundance, and, if that's the case, then it would then tell you that that increase in abundance and the sort of uncontrolled effort, unrestricted, did not result in the catch that would be close to this new ABC that it has been still below. Whether it's because there is just a moderate exploitation rate and that people don't want to go after this species at the higher rate, and they just don't want it in higher quantities, I have no idea.

All taken together, it is, as I repeated, it is a test of the ORCS methodology that is being applied to each species, and it shows up as a potential deficiency, and so it needs to be tested, I guess, with additional work with simulation models or whatever that explicitly explore how the method would work when the population increases in size or declines and how stable those ABCs would be and whether they would be in good correspondence with actual stock productivity and resilience. Beyond that, if the committee, the majority, feels that we could stay with what we have, that's fine as well, but we need to certainly recommend a review of the ORCS applicability to a number of these species and looking for ways for improvement.

DR. SEDBERRY: Thanks, Alexei. I feel like I can live with what the workgroup has recommended, as long as we provide those recommendations regarding the ORCS methodology that several of you have mentioned. Are there any members of the SSC that just feel like they can't live with that? Your concerns are noted, and they will be included in the report, along with the recommendations for reconsideration of the ORCS methodology as the council goes through the ABC control rule amendment, and I think we're ready to move on.

DR. ERRIGO: Well, just to get a consensus on cubera, if everyone is okay with recalculating the ABC using ORCS for that. Cubera is just highly variable, and it has random spikes, because it's rarely encountered, and the spikes are exacerbated by the new methodology, but there is really no

change in the trend. There is really no trend at all, and I think they are mostly incidentally caught, or that's what it looks like.

DR. SEDBERRY: This is a very large snapper species that, like you said, is probably caught incidentally when people are targeting reef fish in general, or other reef fish, and so it has that rare-fish spikiness.

DR. NESSLAGE: This looks like a classic example, again, of the weight conversion issue popping up. We probably wouldn't be over the ABC if we knew what those weights actually were, and so that makes me concerned. I am growing -- My concern is growing over the weight conversion, because this could really cause the council to start chasing their tail on a number of these species when it's not necessary, and I don't know how the SSC handles this in our procedures moving forward, because, if we approve these ABCs and then the council has to respond in some fashion, what is the procedure for us rereviewing this once we see the weights? Is this going to come back to us before the council has to act on this in some fashion?

DR. ERRIGO: It depends on what your approach to solving the problem is. If you feel like these species should be tracked in numbers, which would eliminate all the weight problems, because, no matter what methodology you think is more appropriate, a lot of these species don't get thirty samples in a year of weight, and there aren't thirty intercepts in a year for a lot of these species. You can make that recommendation to the council, and the council will have to go and put in an amendment to change the ABCs, in which case the ABCs that are set will -- It will probably have to come back to the SSC, and we'll have these graphs in numbers and then the calculations in numbers.

DR. SERCHUK: I am always concerned about unintended effects of any method, and it seems to be that this is, as you pointed out, a very rare species, and it's rarely encountered. In my mind, if that's the case, it's not amenable to any of these approaches, quite frankly, because of the high variability.

That's my view on it, but, if you go with this approach, irrespective of the fact that we believe it's rarely encountered, and therefore the method probably won't work, but, if we set an ABC for it, and it's above the ABC, then overfishing is likely going on, and you can't consider it as an ecosystem species, because the law doesn't allow that, the Magnuson Act, and so my feeling on that is, if this truly is a rarely-encountered species, which, quite frankly, no methodology would really work well on it, don't assess it as such, because the unintended consequences -- The catch is above the ABC, and then someone will come back and say, hey, you can't consider it an ecosystem component, because the Magnuson Act requires that, to be an ecosystem component, you can't have overfishing or it can't be overfished.

Be careful of what we are doing here, because I think it should be an ecosystem species, and I don't think we have enough information to put any sort of ABC on this. Again, that's my own personal feeling, but, if we do, the unintended consequence could be that it will never be an ecosystem species, because it's likely to be classified as overfishing is going on, and so that's food for thought for the committee.

DR. SEDBERRY: Does anybody else have any thoughts? That's very interesting. The workgroup recommended that the full SSC consider this as an ecosystem component.

DR. ERRIGO: Then to set the ABC using the methodology that was used previously with the updated numbers, but, yes, they did recommend for an ecosystem component species.

DR. BUCKEL: If it's decided that it's an ecosystem species, then we don't set an ABC, correct?

DR. ERRIGO: Yes, but you -- The process of designating it an ecosystem species takes quite some time, and we're probably going to -- Since it's in the FMP, we're going to have to track landings.

DR. SERCHUK: I don't think the method works well for this stock, and I would not accept this ABC, because I think this is a rarely-encountered stock, and even our catch data is likely to give you no signal, or a spurious signal, and I would suggest that we not accept this, quite frankly, because I think that we're liable to get some outcome that is illogical, given the very limited information we have on this stock. That's my proposal, Chair.

DR. SEDBERRY: If we do not accept this, does it fall back to the old ABC?

DR. ERRIGO: It currently has an ABC, and that ABC will stay in place until something changes. If it's the old ABC, then all the landings will need to be back-calculated to the old landings, the old MRIP data, using the calibration models, but, the further we go in the future, the worse those models will perform.

DR. SERCHUK: I take back my proposal.

DR. SEDBERRY: So we're committed, or we should be committed.

DR. DUMAS: But, again, looking at -- We've got other data. We've got those commercial landings data, and all of them are going down or stable over time, and so I don't think they would justify an increase in the ABC from the old to the new, and so the only thing we're basing the increase in the ABC from the old to the new is the recreational catch data, which everyone agrees is highly variable for these species, and there could be potential issues with the change in the MRIP methodology, but, for the commercial landings data, there hasn't been a change in methodology, right, and they are all decreasing or flat, and so, if these species are really undergoing increases in abundance that would justify an increase in ABC, you would expect to see maybe some increase in these commercial catches, and it's just not there. They are all decreasing or flat, for all three species.

MS. LANGE: Do we have the 2018 or 2019 MRIP numbers, like you did for the gray, and then whatever we've got so far for 2019, just to get an idea if that super peak that's going on for 2017 continues or if that was a -- If we could look at the raw data.

DR. SERCHUK: The other saving grace, Chairman, is if the behavior of the catches in the future is anything like the behavior in the past, you get one year of blips, and then you get nothing. One year it blips, and then you get nothing, and so, if you define overfishing as having a two-year or a three-year period, you can be sure, if the fishery operates exactly the way it is in the past, you won't have overfishing very long.

DR. COLLIER: I do want to point out that cubera snapper is an extremely difficult species to identify from gray snapper. It's basically the patch of their mouth when they are a similar size is how you would distinguish between the two species, and so you have one very common species and then one very rare species, and so that could be problematic for recreational sampling.

DR. SEDBERRY: Yes, and I have the feeling that, when cubera snappers are juveniles, they are even more mixed in with the gray snappers. The other thing about cubera snapper is it's been implicated in ciguatera, and some people just avoid it, and so I'm not sure what its commercial value is, and it's just one of those very rare fish, I think, recreationally and commercially.

DR. ERRIGO: It looks like the 2018 MRIP landings go way back down, but a lot of the landings data in cubera is filled in by other data streams, and there's a lot of zeroes, or blanks, in the MRIP data, meaning there were no intercepts for cubera.

DR. SEDBERRY: I guess we are kind of agreeing with the workgroup's recommendations on this, even though we're not very happy with it. Shall we move on?

DR. NESSLAGE: Just since I'm taking notes, and I want to make triple sure, this is -- The recommendation is the purple line?

DR. ERRIGO: Yes. Moving on to the grunts, we have a MARMAP trend for white grunt, which is right here. I put that next to the white grunt landings here, and so the trends are very similar, and the magnitude of the new data stream was somewhat higher, but it's not significantly -- It doesn't spike up higher in one part of the time series and then is much closer in another part of the time series. It's kind of fairly even across the whole time series, which is nice to see. According to MARMAP, white grunt had been decreasing in the chevron trap index, up until about 2010, and then it has been -- That index has been increasing ever since then, and it's currently above the long-term average.

DR. SEDBERRY: Again, the new ABC recommendation of the purple line is above the most recent landings. Is everybody okay with this? Very good.

DR. GRIMES: What is the latest on the two-stock thing, the northern and the southern population?

DR. ERRIGO: Well, I think a lot of people agree that there probably is, but, until we go through a stock ID workshop to officially designate where that break might occur, if there's mixing, how much mixing, is it a genetic break, this, that, and the other thing, there is no designation of two stocks broken at any particular area. That will have to be like in the SEDAR process, and white grunt has been on the SEDAR schedule for many, many years, but it keeps getting pushed back, due to other priorities.

DR. SEDBERRY: Okay. Next grunt.

DR. ERRIGO: All right, and so this is tomtate, and there is a SERFS index, a trap index, for tomtate, and here it is. That index has been increasing since the mid-2000s, and it is now currently above the long-term average. The trend is generally the same, and the one big difference is that, in the reference period, the magnitude of the landings in the new time series is significantly higher

than in the original MRIP time series, and then that magnitude change decreases in the most recent years.

DR. SEDBERRY: The workgroup had no concerns with this species. Does the SSC have any concerns with it? No concerns, and so the committee concurs with the workgroup's findings on this one, on tomtate.

DR. ERRIGO: Here is margate. The new recreational data adds variability to the landings, and there is no trend, really. It just kind of bounces around. This is one that was recommended to be considered for an ecosystem component species, but there were no concerns noted or anything like that.

DR. SEDBERRY: I would agree with that, that I don't see any reason for concern, and it probably would be a good ecosystem component. It's not targeted, and I imagine that it's just caught along with other mixed grunts and small snappers and there is no directed fishery. Any concerns?

DR. SHAROV: No concerns, but I would suggest that, every time that we have the new ABC that is above everything that has been observed -- Well, in this case, there was one year in the early time series, but, again, we're looking at weights still, and this could be just an effect of weight estimation, and I would suggest that, maybe for each species where we have this situation, with the ABCs being generally or well above all the observed datapoints, apply the same comment, or use the same comment, about this as before for everything that --

DR. JOHNSON: That's deterministic too, and so any stock that we think is moderate or lower is going to have that problem, because it's multiplied by the same sets of scalars, and it's times the highest catch, and so it's going to happen at every case where anything is below like moderately high or something.

DR. SEDBERRY: The comment had to do with the methodology, that it needs to be reexamined for those kinds of species.

DR. ERRIGO: If you're going to reexamine ORCS, you can have one recommendation that reexamines the ORCS methodology across the board. I think that should do it.

DR. AHRENS: One of the challenges with evaluating ORCS as a method is the level of subjectivity that exists within the classification of the status of the species, and I should make a correction to what I said before, that, in the MSE work that's done, it has looked at the catch-only methods, where you use average catches. ORCS itself hasn't been evaluated, because of the subjectivity that exists in that initial establishment of the criteria.

I think it's interesting that -- I think, as you go through the ABC process again, to say, well, what do we mean by moderate and what do we mean by high, and how are those relative to where we think the MSY point is, would be an interesting discussion to have. Is moderate at 50 percent, or 40 to 60 percent depletion, and therefore they're at MSY, in which case the scalar should be one, or is it above that?

DR. JOHNSON: I'm sorry, and I don't want to get off-track, but I think those were sort of in a vacuum. They were looking at the traits of the fishery and things and not anything with the status.

If you took just a random stock that had these biological characteristics and this level of sought-after-ness, this value of the fishery, those sorts of things, those would put it in a given category, sort of in a vacuum relative to where the stock actually was, and then they would look at that.

DR. AHRENS: Because, if you look at the work that Caruthers and others have done on the MSE work, the catch-based methods, if you are kind of above -- If your biomass is above that kind of intermediate level, then they're fine, and, of course, if they're below, then you introduce depensatory mortality, and they perform really poorly, and so there's a pretty big jump as you kind of move over that productivity hump with that stock, that the performance level really switches dramatically.

DR. SERCHUK: I may be preaching to the choir here, but remember that ORCS has an "R" in it for reliable catch data, and, for some of these species, quite frankly, infrequently encountered catch, meaning the total removals from the stock, whether they be discarded or landed, probably cannot be considered reliable throughout the time series, and so let's remember the method that we're using and what it requires when we start talking about its robustness. Thank you.

DR. ERRIGO: When we originally applied ORCS, there are twice as many species, unassessed species, that we looked at than ORCS was applied to, and there are many that didn't have ORCS applied to them, for various reasons, but perhaps another look to see how reliable are these catches, in light of all the recent information that we've gotten about MRIP and everything else, would be beneficial.

DR. SEDBERRY: Good point.

DR. LI: ORCS, the methodology itself, has been evaluated, and it's a good methodology, but, here, when we see -- Based on my understanding, when we see the ABC line is above all the catch or time series -- This case happens to be a very special case, which, in this case, you have your highest catch happens to be within the reference time period, and your first scalar, the overexploitation scalar, is bringing it up too high, but the risk scalar brings it down too little, and that's why this line is above all the catches.

It's just a very special case that happens to have happened here, and why this is a special case and it happened to this species -- Maybe this species is a very special species, and it's like -- When you assign the risk scalars, it happened to have a very low council risk scalar to it, for some reason, and so I just feel that this is a very special case.

DR. AHRENS: To get back to Fred's point, if we look at margate, there is no PSE in the MRIP below 30 percent, and recent years is above, generally above, 50 percent, and so thinking about what reliable means is probably a nice suggestion.

DR. ERRIGO: In general, the ones that have the ABCs significantly above all the catches tend to be the stocks that are not targeted and are incidentally caught, and people don't really mention them or care about them very much, those kinds of stocks, because they are not -- They don't have a fishery built around them, and so there's not a lot of effort or exploitation. They tend to be the ones that have a low risk of overexploitation, and therefore a high risk tolerance, and so they get -- The catch statistic gets expanded up very high and then brought down very little.

DR. LI: I was trying to say -- Like, previously, I was trying to say that, given that this is a very special case, I don't think we should trigger really variation of the methodology, because of this special case.

DR. SEDBERRY: Are you suggesting that the existing ABC should be kept? Is that what you -- Yan, you're just reinforcing that the ORCS approach needs to be reexamined?

DR. LI: I was responding to like we were discussion reevaluation of the methodology, and I'm saying this is a special case, and also it happens to have the highest catch within the reference period, and that's why we are observing this figure here, and, in this special case, I would not think that it should trigger a reevaluation of the methodology, and I'm okay with the purple line, to be consistent with other species.

DR. SEDBERRY: Can we say that the SSC as a whole is okay with the purple line?

DR. LANEY: Okay. I'm the new guy on the block, but it certainly makes me nervous when we're seeing all these species with this purple line way up above the previous ABC, and one of the aspects I think about on this is, even though these may be, as Mike just said, very lightly-exploited and non-targeted species, in many cases, what does it to do to public expectations when you significantly jump the ABC way up above what it was before, or at least considerably higher than it was before, and is that something the SSC needs to think about, too?

Certainly the council will think about that, I would think, but do we have a responsibility to consider the public reaction when we have doubts ourselves about the methodology, in this particular case, causing us to recommend to the council numbers that are considerably higher, in some cases, than where we think they probably should be, and, again, it gets back to the fact that we have to act using the best available scientific data, even if we've got PSEs that are considerably above the level that we would consider to have a high level of reliability, and I don't know, and that's more a question, although it was somewhat of a rambling statement.

MS. LANGE: A clarification, Mike. The purple line, the lower part, the lower plateau, is using the high-three, the decision tree, method?

DR. ERRIGO: Yes, and so that's the third-highest landings in the reference period.

MS. LANGE: Okay, and so not high three, but third-high, and then, for the same time period as the upper line, which uses the ORCS method.

DR. ERRIGO: Yes.

MS. LANGE: So we are providing, in these plots, both the decision tree and the ORCS-recommended ABCs. For those stocks where we've had discussions, like Rob just looked up and saw that these aren't really reliable, can we just say that we agree with the purple line, but our recommendation would be to look at the decision tree rather than the ORCS, because of the variability and the unreliable data, or have we already told -- My understanding is we haven't told the council that we believe the data here is totally reliable and that we should be using ORCS on these stocks, and isn't that what we're supposed to be doing now, is deciding whether they are ORCS stocks or -- No? Okay. Sorry, John.

MR. CARMICHAEL: I mean, what you're doing now is just trying to address the changing scale in MRIP data, which, if you don't, they have to hindcast the landings they collect now back to the old MRIP approach. Each year that goes by, that gets more difficult, and the agency is not interested in doing that many years, and it would come to the Region and the Science Center to probably do it, and so it's kind of a technical logistical problem.

I certainly appreciate the constraint that all of this imposes, and I think there has been -- You are kind of in a box, as others have sort of mentioned. Like you're dealing with this, and you're limited about what you feel like you can respond to and how to deal with it, and you're limited with the information that you have, and all of that is true. I think, in a way, part of that is complicated, or confounded, by the fact that this is also sort of a kind of minor, ten-thousand-feet evaluation of how the ORCS and the data-limited ABC control rule in general has even performed, but you don't have the full suite of information to look at that, and you haven't looked at how ORCS was derived in the first place and what its intent was.

Mike mentioned the fact of ORCS being set out, and it's a limit. The ABC is a limit and not a target, and, just as with our data-limited ABCs, the idea was to maintain that same long-term average landing, and we haven't looked at all that stuff so much, and so I feel like you are -- I think there's a number of stocks that you guys have raised concerns, and you have raised issues with ORCS. I think all of that is really useful discussion when we get back to the ABC control rule, and I think we're going to have to take a much harder look at the ORCS approach itself relative to new research and new approaches and data-limited information.

I think all of that will be helpful, and all of this discussion is going to be really useful to that, and so we may sort of go through a lot of things and end up at, well, we're just going to kind of go with that revised ABC, due to the MRIP data, and that's not necessarily a terrible outcome, and this could be in place, perhaps temporarily, and I think having a list of things the SSC thinks should be done as next steps would be really helpful and ways to look at the ORCS and ways to really evaluate it.

Fred make a great point that this is the ORCS, and the "R" is still valid. When we did this before, we kind of thought it was for the stock that it's applied, and now maybe we're having some second thoughts on that, and I think that's fine. It always happens as science progresses, and so this is sort of a hind-sight look at it, but it's okay to have new ideas and apply new stuff, and just keep in mind that this stuff is in place, potentially temporarily, and it doesn't have to be forever. It is our first look at it, and I think that there is going to be a lot more work that we're going to have to do to get a handle on how these data-limited things have performed. One thing that I think would really be useful is to come up with like what is the most useful information to be collected for some of these stocks that would answer some of these questions.

Rob, you mentioned like the data-limited things really hinge on what your actual biomass is, and, obviously, that seems completely true. If you assume your biomass is good, and you come up with some data-limited thing that just maintains the average landings that gave you that biomass, then, of course, things come out good. If you decide that it was bad, then maintaining those average landings is going to push you into a bad place. I mean, it can't perform any other way if the calculations are done correctly, and so, if there's a real inflection, maybe finding some insight on

biomass of some of these unassessed stocks some way might be the really crucial information, and so I think that's the other next step.

All these little tidbits have kind of come out, and so I guess I don't share, necessarily, all of the concerns about the future and the application of this as we move forward, because I think it's pretty clear, from all of you all's discussion, that we'll be handling this in a different way down the road, once we get more information before you and come up with some maybe guidance on what the right information is and probably some more workshops to deal with the data-limited stocks, before we get around to wrapping that up in the ABC control rule amendment.

DR. AHRENS: Indulge me for a second here. If we look kind of back at the margate, and we take the 1999, which was the high, I suspect, and it has a PSE of 67 percent on it, and so let's carry that uncertainty forward onto the ABC recommendation that comes out of it, and that means, if you look at the 95 percent confidence interval on that, it is going roughly between zero and 600, in this case, or whatever scale you want to get, and so that's a pretty -- If you're willing to consider the uncertainty associated with that recommendation, it's fairly high, and that may be kind of one way to view this, particularly in the ORCS method that are just picking a single point, instead of averaging over a bunch of them.

DR. SEDBERRY: Shep, did you have a comment?

MR. GRIMES: I have more of a question, and it relates to back-casting or trying to use the old MRIP or old MRFSS information, and so I thought the SSC is walking through this process, and you're developing new ABC recommendations, following your existing control rule, which you are allowed to vary from, but you're walking through this process, but you're using the new MRIP information, and I think it was Anne that asked earlier -- Let's say, if you looked at the purple line that you have, and take margate for instance, the lower level of the purple line is based on following your existing ABC control rule, but you're using the third-highest year, and so you're going to what I guess is like Level 5, unassessed stocks, but no reliable catch.

If the SSC felt like -- You may have made a recommendation in the past, based on Level 4, unassessed stocks and only reliable catch, using ORCS, and, now that you have looked back at it, you're like, well, we're not so sure that it was reliable, and you wanted to make a recommendation using the third-highest, instead of the ORCS approach, and I guess I don't understand how that then prevents everyone from using -- What prevents the agency from using the new MRIP information for ACL monitoring and everything moving forward, because you have an ABC recommendation using this methodology that incorporates the new MRIP information, and I don't know if that entirely makes sense, but, if somebody could address that for me, it would be great.

MR. CARMICHAEL: I think that does make sense, and I think that is something that could be done. If the committee decided like -- If we decide, for this species, that the catch really doesn't meet reliable, and you wish to apply some other part of your control rule, my sense is that would be fine.

You could say, oh, let's take this one and use the third-highest, but you may need to, perhaps, get some evaluation of that kind of stuff and come back to it, and I don't know that -- Some of that may be a little tougher to solve right here at the table, and you may have to give Mike a chance to actually come up with the proper third-highest and give you a chance to look at it, but, yes, I think,

as far as what Shep is saying, I think I certainly wouldn't see any issue if you guys said, oh, we don't think this stock is ORCS anymore, and we think the council should base the ABC on a third-highest and that's what our recommendation is. I think that would be all right, but you will just have to make sure you address why you no longer think ORCS is acceptable.

MR. GRIMES: Then, going forward, your new ABC recommendation will be in the new MRIP currency, correct?

DR. ERRIGO: Yes, that's correct.

DR. BUCKEL: Just to add -- So, if it is Level 5, it's not just the third-highest. If you go through and you felt like the catch is going to lead to decline, and there was directed fishery, it would be the median of the catch over the reference period, and so that's even a lower value.

DR. SCHUELLER: I also would suggest that we can't just start with margate and do it from here. We really need to have a more systematic way to define reliable catch and then re-look at all of the species, because there are some that we have gone by that may qualify, depending on what criteria we set up, and/or none of them may qualify, plausibly.

DR. ERRIGO: Perhaps we can do that at a later time, where I can go and pull PSEs and variabilities and things like that, to help you guys decide on what is reliable and what is not. I also wanted to, very quickly, remind everyone of how these ABCs and ACLs will be tracked. This is a complex, and so, even though each species has its own ABC and ACL, we're only going to track this, which is the sum total of the ABCs, and this is the sum total of the landings, and so we track this against this. As you can see, a lot of it is white grunt, but just to remind everyone and put it into perspective what's going on here, and so we're not tracking each species individually to say that, oh, this went over its ABC, and so we're going to have to shut it down or whatever. We're only tracking the complex, to see if it goes over its ABC and then shut it down.

DR. AHRENS: So, to follow that, that would require then, for the reference period, going in and getting the biomass and then the associated PSEs for each year and then doing -- For the complex itself, doing a biomass-weighted average of the PSEs, to determine if the overall PSE for that complex was at a certain threshold, say below 30 percent or something, to say this is a reliable catch stream.

DR. ERRIGO: Well, the ABCs are still set individually, and they are tracked as a complex, but they are set individually, and so you can say, oh, this stock has unreliable catch, and we're going to use the decision tree, and this stock in the complex does have reliable catch, and we'll set the ABCs using ORCS, and then we add them together, and that's how the complex ABCs were developed.

DR. NESSLAGE: I am starting to forget now. Are MRIP PSEs based off of numbers?

DR. ERRIGO: They calculate the PSEs for numbers and weight.

DR. NESSLAGE: I am sounding like a broken record, but I am guessing the biomass-based PSEs are much higher than the numbers-based PSEs in general, and that would just be a prediction.

Maybe not for the species, but, across-the-board, I am guessing that that's how it's going to come out, because you need the intercept weights to come up with those biomass --

DR. ERRIGO: That's what I thought also, but it's actually not always the case, because the PSEs depend on how many samples you have in a particular strata and the variability between those samples, and so let's say you have lots of intercepts in a particular strata and numbers, and each of those intercepts caught wildly different numbers of fish, but you only sampled like five weights, and the weights that you sampled were very similar, and the PSE for weight is going to be very, very low, but the PSE for number is going to be very, very high. The overall variance between the estimates in weight and the estimates in number should be bigger for weight if you incorporate the fact that they are inputting weights, and so there is uncertainty there and things like that, but that's not incorporated into the PSE estimate.

DR. DUMAS: These potential large increases in the ABC are coming about because of large increases in the MRIP, and the new MRIP numbers are larger than the old MRIP numbers. Suppose an all-knowing deity came down and told us that the new MRIP numbers were correct, that they were correct. For me, the important question is why? Is it because the new MRIP numbers are larger because of the increase in recreational effort, or are the new MRIP numbers larger because of an increase in stock abundance?

It seems, if the MRIP numbers are larger because of an increase in effort, then we don't want to increase the ABC, with all else being equal, because we just found out that the fishery is undergoing more pressure than we thought it was undergoing, and so, on the other hand, if the MRIP numbers are larger because of an increase in abundance, then I feel like we would be justified in increasing the ABC, because there's a larger stock and it could handle the increase in recreational effort, and so do we have any additional data that would allow us to look at whether the increase in the MRIP numbers are due to an increase in recreational effort or an increase in stock abundance?

One thing we could look at would be the commercial landings, and the commercial landings are just going down, decreasing, or they are constant. Like, for white grunt, the commercial landings are just going down, down, down, and so it seems like, if it was an increase in abundance, that we would see some increase in commercial landings, but we don't, and so that would indicate to me -- Still, this information is limited, but, from the limited information we have, that would tell me that the increase in the MRIP numbers are due to an increase in effort and not due to an increase in abundance of the underlying stock, and so, if there's no increase in the abundance of the underlying stock, we would not be justified in increasing the ABC.

MR. CARMICHAEL: Actually, the deity would come down and tell you that what you're calling an increase is because I have corrected your ruler. The stock is what the stock is, and nothing about the change in MRIP changed the number of fish that were alive in 2000. It didn't change the number of fish that were caught in 2000, but it has just changed our perception of that, and so the stock is exactly what it is, and the landings are exactly what they were, and our method of now measuring them is, according to all of the exhaustive reviews, is now corrected, and so the deity has fixed our method and repaired our rule and applied that to all of our historic measurements and said, okay, now you're good. We don't know, and the stock hasn't really changed, and the catch hasn't really increased, but just our estimates of all that stuff have changed.

DR. DUMAS: Right, but, with the better estimates, we now realize the recreational fishery is catching more rather than less, and so, if the stock size has not increased, that means that the recreational -- That means that the stock is undergoing increased pressure than we thought before, larger than we thought before. I think, before, we were underestimating the recreational pressure on the stock before, and we were underestimating it, right, because we thought --

MR. CARMICHAEL: The pressure is still the same as it was. Our impression of what the pressure may be -- The contribution of the recreational harvest to the overall removals is higher, but the stock size, all other things being exactly equal, the same mortality rate that was true in 2001, that we thought in 2002, that we now think in 2019, that is exploitation rate and whatever truth was, is still exactly the same, and so that exploitation rate relative to the stock's abundance to pressure is all exactly the same, and nothing has really changed.

In assessments, if there is no changes in selectivity or significant changes in the trends, or any of those other ancillary things, the length comps within this MRIP stuff, the stock size is just increased to offset these greater removals. I mean, the stock assessment calculations, just doing a simple stock assessment, they absolutely would have to. Catch is just a scalar. In some cases, they haven't quite exactly responded, because of the time series and changes in selectivity, but it's just the scalar, and so I think the pressure and all of that stuff is all exactly the same. We just now realize that maybe, in a lot of fisheries, recreational is perhaps an even bigger component of the overall removals than we used to think.

DR. LI: Just to follow-up with Chris, a question. When you say ABC increased, you mean for a given line. For example, the purple line, the lower-level purple line, increased to the upper-level purple line, or do you mean the purple line compared to the black line is increased?

DR. DUMAS: I was talking about the purple line compared to the black line.

DR. LI: I am thinking like, to me, it's less concern, because the purple line is higher than the black line, because of the baseline data and MRIP data magnitude is higher itself, and so I would look at only the purple line and the red line. The black line and the blue line, I feel that the distance between those lines is kind of consistent, the same, and so, to me, that is concerning, which means we will reach the same conclusion using either the older ABC, the black line, or the purple line, the new ABC, and I will have concern if we would reach different conclusions. For example, based on the purple line, the 2016 is reaching the ABC, but, using the black line, it's not reaching the ABC, and then I do have concern, for the reason that the data is higher, back to the discussion in August, the MRIP data workshop, and they explained the effort or whatever with all the factors.

DR. ERRIGO: We only have one more grunt. It's sailor's choice, and I don't know what that is. I don't think anybody knows what this is, and, in fact, it suffers from -- There may be ID issues with sailor's choice, and that's what the workgroup suggested. I don't know. I don't even know what a sailor's choice looks like.

DR. SEDBERRY: Sailor's choice is also a common name applied to pinfish, which is a scup, or a porgy. It's a porgy, and so there is a lot of confusion about this species, and, again, this is something that is not targeted.

DR. ERRIGO: Right.

DR. SEDBERRY: It's a very small fish, and, again, it's probably caught along with mixed grunts and small mixed snappers.

DR. ERRIGO: It also has almost no commercial landings. There are no commercial landings.

DR. SEDBERRY: I suspect all of it is from south Florida.

DR. ERRIGO: I didn't go that far into the data, to see where they were coming from, but all the weird fish tend to come from south Florida.

DR. SEDBERRY: I don't really have any problems with this. I don't have any thoughts about it at all.

DR. LI: For this sailor's choice, it's a species that -- It's a group of fish, or it's a group of species, or it's just one species that is hard to identify?

DR. ERRIGO: It is a single species.

DR. LI: Okay. For this one, why is this one not recommended for ecosystem components? There is no trend.

DR. SEDBERRY: I don't know, and we've had some previous discussion about what exactly an ecosystem component is, and that needs additional -- I think that needs additional consideration, and I don't know why it's not an ecosystem component either. It's not targeted, and it may be targeted for the bait fishery, just like pinfish is, but I'm not sure. I just don't know. I think it's pilings and bridges and docks, the shore mode primarily, where it's caught, but I don't know much about it, really.

DR. AHRENS: I think it's interesting to note that it looks like this one is based on the decision tree.

DR. ERRIGO: Yes.

DR. AHRENS: Whereas margate was not, but yet, if you look at the PSEs coming out of MRIP, they're about the same, and so I think there's some inconsistency.

DR. ERRIGO: I don't think the PSEs were used originally to determine whether a stock was ORCS or decision tree. There were other factors, like species ID issues and things like that, that determined whether a stock had reliable catch or not.

DR. NESSLAGE: Are you telling me the PSEs are in the range of --

DR. AHRENS: They are in the range of 35 to 89 percent.

DR. NESSLAGE: Because this stock -- They are claiming the landings are going from 10,000 to half-a-million pounds in one year, and nobody knows what this species even is, and I'm having a real hard time calling this one reliable catch.

DR. ERRIGO: Right, and so we did not use ORCS for this. This is the decision tree, and this is -- A lot of this is caught from shore, and that would explain why the calibrated data series, depending on where the intercepts happened and when it spikes up like that, because, if those encounters happened in shore mode areas, that happened when the calibration -- It happened to be expanded exponentially higher, because of their shore mode, and it could cause a pattern like this.

DR. NESSLAGE: Just to follow-up on that, even if it decision tree, then you're saying that's the median, based off the median?

DR. ERRIGO: Third-highest.

DR. NESSLAGE: Third-highest. Even so, third-highest is in the range of 350,000 pounds, or 400,000 pounds, which I'm having a hard time believing as well, and so I am on Yan's side. I think we shunt this one to ecosystem consideration, and I don't think we have any idea what this species is or who is catching it or how many are being caught.

DR. ERRIGO: The third-highest in the reference period is 97,000 pounds. The reference period is 1999 to 2007, and so this point.

DR. LI: Are those red-line spikes due to weight conversion again or MRIP numbers?

DR. ERRIGO: No, I don't believe so. It wasn't one of those species that stuck out when I did the analysis of the weight conversions. I think it's just due to the MRIP calibration, and, like I said, if there's a large shore mode component, it could cause that, especially if it's rarely encountered.

DR. AHRENS: MRIP numbers are going from 20,000 to 470,000 over the reference time period, and so there is very little influence of the weight on that swing.

DR. SEDBERRY: I think this should be an ecosystem component, and I don't know what we have to do about the ABC, and I don't think it makes any difference. I think the reference years are probably more realistic than the rest of the time series, and the new ABC is as good as the old ABC, but it uses the new MRIP information, and so that's a good thing about it, but I really just think this should be an ecosystem component. Okay.

DR. NESSLAGE: If we're going to wrap up, can we just reiterate where we think we are, since I'm taking notes, again, and so we're okay with the working group new ABCs for white grunt, tomtate, margate, and that we suggest sailor's choice being an ecosystem component, but, even so, we still need to approve the ABC, right?

DR. ERRIGO: I have to use the third-highest.

DR. SEDBERRY: Have you got all of that? Okay. Let's take a fifteen-minute break. We'll come back at eleven o'clock.

(Whereupon, a recess was taken.)

DR. SEDBERRY: All right, folks. I hope you enjoyed your break, and I think now we're going to take up the shallow complex, shallow-water grouper complex.

DR. ERRIGO: This is the one with the hinds and the groupers. For this one, for red hind, there is -- The trend is generally the same, and the magnitude is not that much different either between the old and the new trend. There was -- The workgroup did ask to check on the difference in exploitation categories between red and rock hind, and that was decided on at one of the ORCS meetings, and let's go over to where the ORCS is.

DR. SEDBERRY: What is meant by exploitation category?

DR. ERRIGO: The risk of overexploitation category. Red hind was considered moderate, and rock hind was considered moderate high, and I remember -- I looked, and those were the designations, and I wanted to make sure that I didn't make a mistake, but I didn't dig all the way through to figure out how we came to that. The notes and everything from that meeting are a little scattered, and so it's difficult to put together exactly what made this moderate high versus red hind being moderate.

DR. JOHNSON: Mike, I remember, when we were doing that, there were numbers that were then converted into sort of these categories, and so I think it's possible to have like a 3.49 be a moderate and like a 3.51 be a moderately high, and so it might be -- I don't know the numbers, but it might be possible just because of way that they were categorized, and they ended up in two different zones.

DR. ERRIGO: Yes, right. I remember calculating out all the numbers and then having the group that we had there look at them and say, well, I think it should be here or there, or I agree with that, and I don't know exactly how red hind and rock hind got different categories, but they did. That is red hind, and the trend and the time series are very similar, and this is rock hind, and it's pretty much the same thing, and the trend is generally the same, and the magnitudes are generally the same. These two years are higher, and these are fairly rarely encountered in MRIP, and you can see there the highest landings is 60,000 pounds, and so they are fairly rarely encountered, and so this is just an artifact of the calibration, I would think, and so that's rock hind. I will just go through all of them real fast.

Then the rest of them are very rare encounters, and we used the decision tree for the rest of them. This is yellowmouth grouper. As you can see, the trend and magnitude is pretty much the same, except for in the random spike years, where the spikes are higher in the new data. Here is graysby. It is spiky and variable, and the trends are basically the same, and the magnitude is higher in the recent years, for a few years, and then it goes back down in 2017. The workgroup suggested looking into if there is any changes in distribution for graysby. Coney is very rarely encountered, and we see there is almost no difference between the two time series. It's just noise between the two of them.

Then yellowfin grouper is pretty much the same thing. It's just noise, and there is almost no difference. In fact, the ABCs are almost identical. This is one of the few where the new time series has a point lower, significantly lower, than the old time series. That's the shallow-water complex, if you guys want to start with the hinds.

DR. SEDBERRY: These are relatively rarely-encountered, smallish shallow-water groupers, and some of them have some identification problems that probably show up in these landings, and yellowmouth grouper is confused with scamp, and a lot of these little spotted groupers, like coney and graysby and red hind, and rock hind, are confused with each other from time to time too, but they're all kind of rarely-encountered species.

DR. SCHARF: Just a question. Why is the yellowmouth grouper in the research track? Is there a particular rationale for why it's a research track?

DR. SEDBERRY: Scamp is actually in a research track, and yellowmouth is confused with scamp in the landings, and so it's being considered along with scamp, because it may have to be combined and I'm not sure what is -- It's being debated right now, and they're looking at DNA evidence and everything else to try to decide how to split up the landings or to do that research track assessment for scamp.

Again, for this series of species, I guess the workgroup has considered the new ABC recommendations and the time series and found no difficulties with either, and how does the rest of the committee feel? No issues with the time series or the assessment approach? Okay. All right. Now the porgy complex.

DR. ERRIGO: Yes. The porgy complex, and then, after this, we go to some that have some interesting issues to discuss.

DR. SEDBERRY: Yes, and the previous ones have not been interesting. These are kind of some kind of rare porgies, and some of them are more southern, Caribbean, and some of them are more northern, but they're occasionally landed here in the Southeast.

DR. ERRIGO: Okay, and so it says that there is a SERFS trap index for knobbed porgy, and I either missed it or the graphic wasn't in the trends report, because it's not here, and that's my mistake, and I'm sorry, but there is a -- For scup, there is a Stenotomus index, and Stenotomus includes scup and I think longspine porgy together, because apparently it's very difficult to tell the difference between the two, and so they index them together.

Here is jolthead, and I think all of these are decision tree stocks. Here is jolthead, and the trends are pretty much the same, and the magnitudes are very similar, except for this ramp-up at the end of the time series, and that's higher in the new MRIP numbers, but then it drops back down to the level where it is very close to the old MRIP numbers, and here's knobbed porgy, and so the SERFS trend shows a decrease, even more dramatic than the decrease in the landings, and you can see that the landings are kind of decreasing almost over the entire time series. The trends are generally the same, and the magnitudes are generally the same between the two datasets. The workgroup recommended being conservative when setting the ABC, due to the decline in the SERFS index for knobbed porgy.

Here is saucereye porgy, and this one is highly variable, and it's not terribly often encountered, and it's pretty rare. Like this huge spike is 25,000 pounds, and so it's not really that huge, but, other than these occasional spikes, the trend and magnitude are pretty much the same. You can see the ABCs are very, very close. It's less than half of the long-term average, and it's been decreasing pretty much the entire time series.

DR. AHRENS: So this seems to be a pretty similar trend to scamp, and we have a fairly similar -- For the knobbed porgy, it's a fairly similar kind of ABC recommendation, and so I think we're kind of in the scamp world, in terms of the information that we have, and so I agree with the working group's concern in the trend, and maybe we could put similar language to what we put in for scamp in this case.

DR. SEDBERRY: For scamp, did we make a recommendation for the change in the overexploitation risk?

DR. ERRIGO: No.

DR. AHRENS: Scamp was ORCS, wasn't it? This is decision tree.

DR. ERRIGO: Scamp was ORCS, but you decided to set an ABC value based on average landings in the end of the time series plus a buffer for the variability, the PSEs, which we can do here if you want to treat it similar to scamp.

DR. AHRENS: The PSEs on knobbed porgy seem to bounce around 50, although a little bit lower, and kind of around 40 for the reference time period.

DR. ERRIGO: If you like, over like lunch or something, I can calculate what the ABC would be, the same way I did for scamp, and put it up there, so you can see what it would look like, if you're okay with using the same methodology that we used for scamp.

DR. NESSLAGE: Going back to our justification for scamp, we had there was the decline in landings, decline in the SERFS index, and they hadn't met -- The fishery hadn't met the old ABC either in recent years, and we don't -- We seem to be awfully close though here, at least in the last five years, and maybe not the last three years, and is that a concern, if we were to apply this scamp-like method to knobbed porgy?

DR. SEDBERRY: Well, the decline in the SERFS index, as for scamp, is concerning and supported by the decline in landings too, but the landings have been closer, as you said, closer to the ABC a few years back.

DR. BUCKEL: I think one of the reasons these were in Level 5, and so unreliable catch, is because of the ID issues, and so knobbed may stand out compared to the other porgies, but there is still just lumping of porgies, and so I would -- I think there's an argument that we -- Before, we had said these weren't reliable catch data, and so we really want to rely on the fishery-independent SERFS for what's going on, and so I would vote for using the same approach that we used for scamp, and the justification would be the SERFS index.

DR. SEDBERRY: Yes, that's a very good point, that there are species identification problems that contribute probably more to the landings for this than they do for scamp. Scamp is confused with yellowmouth grouper, but yellowmouth grouper landings are so tiny compared to scamp landings, whereas the other porgies are somewhat comparable to the knobbed porgy landing levels, and very similar in appearance as well.

DR. ERRIGO: Okay. Here is jolthead.

DR. SCHUELLER: Was there some sort of management regulation that went into place for this species, given the look of this, because clearly the last -- Well, maybe the very last year, it's barely underneath the ABC, but there's like five years in a row that this was above the level for the old metric, but not because it's a complex, right, and so --

DR. ERRIGO: There were no management measures in place for jolthead porgy or the porgy complex or anything like that, unless it was closed in 2017, and I think there was a closure. Maybe there was a closure? There may have been a closure, and I remember a porgies closure at some point, and that might be why 2017 drops like that.

DR. SCHUELLER: I was going to say, if you look at the complex, old porgy complex, landings, they are still over that in four of the last five years. At least one of these species has additional data that, from my understanding, could be -- Obviously, knobbed porgy has a fishery-independent index, and so I feel like, again, we could add to our suite of species that should be on the docket for SEDAR at some point.

DR. AHRENS: If we look at the Florida MRIP for jolthead, it has that increasing trend from 2012 to 2016 and a drop-down in 2017, and it's back up a bit in 2018, and then to what they have in 2019, and it's back down, but that's only part of the year.

DR. ERRIGO: This is the old data for porgies, and closures would be caused by this landings time series against this ABC/ACL. This is what the new data would look like.

DR. SCHUELLER: I am not a porgy expert by any means, but I am just wondering if, within this complex, there is some sort of maybe switching of species occurring, and I know a lot of these species that we've talked about aren't targeted, et cetera, but if knobbed porgy is going down, and jolthead is going up, I kind of start to wonder if, because they are not catching knobbed porgy maybe in as much frequency, because of -- Assuming there is no ID issues, but, if they're not catching them as frequently, are we then picking up jolthead and then that sort of brings into the question -- That is something that is of concern when you're managing a complex, is that some species are individually being overfished while others aren't, or overfishing is occurring, and so can anybody shed some light on that?

DR. BUCKEL: If you look at the note up there, this jolthead porgy is -- The bulk of the landings are Cape Canaveral south, and so it's a tropical porgy, and so it wouldn't replace knobbed, and so that is likely not the explanation, but it could be that, with increased warming, joltheads are able to start moving further north and make up a larger portion of the landings in our area, but we don't know, and that was just one of the discussions on the webinar, but we don't have any data to support it, but that's one possibility of what is happening here, but I do come back to what you said before about using other methods. I agree with that, and I would just add, in addition to the fishery-independent data that we have for some of these porgy species, there have also been age and growth studies, and so, in fact, for this one, Mike Burton and Jennifer Potts just published a study for jolthead porgy, and there is other studies for the other species.

DR. SEDBERRY: Knobbed porgy, a life history study has been done, but it's old, and whitebone porgy has one, and it's old.

DR. BUCKEL: Yes, and so just further support to try to get some other approaches used for these species, to improve the ABCs.

DR. DUMAS: For what it's worth, for both jolthead porgy and knobbed porgy, the commercial landings show very, very similar trends to the new recreational landings data, which may support your point, and maybe it's not so much a change in the recreational effort as the fish moving and a changing stock.

DR. SEDBERRY: I think saucereye porgy is a seagrass species, isn't it? Isn't it really shallow water? Knobbed is kind of a shelf-edge, and jolthead is a deeper species too, and whitebone is a live-bottom species. It is more southerly, too.

DR. ERRIGO: Just so everyone knows, the recreational closure for porgies happened in 2016, where the highest point for jolthead porgy is.

DR. SEDBERRY: Just a recreational closure?

DR. ERRIGO: That one, yes. There was a commercial closure in 2014 that happened in December, and so I'm not sure that you would see much of an effect of that.

DR. SEDBERRY: Are there any objections to using the time series and the ABC methodology with these species? There is a recommendation for ecosystem component for saucereye porgy, which I think would probably be good. We had some special recommendations for knobbed porgy, because of concern from the workgroup and the SSC in general.

DR. NESSLAGE: What did we decide for jolthead and whitebone, because they are going to be over their ABC.

DR. ERRIGO: It's difficult, in a complex, to keep each individual species to its ACL or ABC. The idea is you're not tracking them individually. You are tracking the complex to try to get a better handle on the actual landings, because, for each individual species, the landings are kind of unreliable, and so, if you track all the landings together of similar species, hopefully you get a better estimate of what's going on, and so you add all the landings together, and that occasionally means that some species will be over your limit and some will be under.

DR. NESSLAGE: Then we can be okay with -- I think I can be okay with these, with the recommendation that the SEDAR process, the Southeast Center, considers pulling jolthead and knobbed out for individual assessments, for consideration of building individual assessments. Just to clarify though, we will have the revised -- Mike is going to calculate the revised knobbed porgy ABC based on a 40 percent PSE, and is that --

DR. ERRIGO: Well, I will take a look, and I was going to do it based on the PSEs in the most recent time period, because that's where I am going to get the -- I'm going to take the average landings in the most recent time period and then the average PSEs in the most recent time period and increase by that. I believe that's what we did for scamp. It was the PSEs in the time period that we calculated the landings average.

DR. NESSLAGE: Just so you don't have to redo numbers again after lunch, for scamp, we kind of pulled the 200,000 out from Fred's expert goggles, looking at the data, and do we want to have a defined recent period, to make it easy, so we don't go, oh no, we meant the last three years, instead of the last five years, and have you recalculate it?

DR. ERRIGO: If you would like to be specific, that would be awesome.

DR. NESSLAGE: Because this isn't as obvious. With scamp, it was pretty flatline the last -- As I recall, it was pretty flatline in recent years, using air quotes. Here, there's a decline.

DR. ERRIGO: There was a single spike, but all the other years are on the same magnitude.

DR. SEDBERRY: So 2015, 2016, and 2017, the last three years?

DR. NESSLAGE: If that's the case, do we want to make sure that we're using the same methodology for scamp, or do we have a --

DR. ERRIGO: I think you can deviate from the years, and you have done that for other species for the reference period, based on differing reasons. If you feel that the years previous to that are not really representative of what's going on now and that setting an ABC using those years would be detrimental to the stock now, then I think you're justified in not including them.

DR. SEDBERRY: Okay.

DR. ERRIGO: Okay. Moving on to jacks. For almaco, the trend is the same during the reference period, but there's a significant increase in the later part of the time series for almaco, and the workgroup suggested reevaluating the use of the third-highest, and they also suggested that you may want to remove almaco from the complex, due to increased targeting of almaco. Also, I did an analysis looking at almaco jack landings and greater amberjack landings, and they seem to track very well. When one goes up, the other goes down, a lot of times, and, from what we've heard from some anecdotal evidence, depending on what's open, the fishermen will land either greater amberjack or almaco jack and just call it amberjack, or, if amberjack closes, then they will land everything as almaco.

DR. SEDBERRY: The increase in SERFS that they mentioned, I presume, is in the video index, since they don't trap, or maybe they do, but I can't imagine. Wally says they are getting them in traps.

DR. ERRIGO: There wasn't an actual graphic of the trend line in the trends report, I think because the data is disjoint. The data is disjoint, and it's not continuous across all the years, but I guess it was lower in the earlier part of the time series and higher later.

DR. SERCHUK: Sorry to be a bugbear again, Chairman, and so, under the old data, this stock looks like it was at or below the ABC level. Under the new ABC/ACL, the last three datapoints have been above the ABC level, yet we get -- It looks like there has been an increasing trend in landings during the 2000s, and yet we have a message here that it looks like we've seen an increase in the fishery-independent measure here, and so there is somewhat mixed messages being sent,

and I am not sure what the most recent data suggests, as 2018 or 2019, but, if you go along with the new ABC/ACL, and you have three datapoints that are above that, that is one message.

The increase seen in the SERFS data is another message, and so is there any way to reconcile this or any way to try to make sense of this? One says that overfishing is occurring, and another one says the population size is increasing, and so what's a manager to do?

DR. SEDBERRY: Well, I think this kind of relates back to the issue that Chris has raised a couple of times, is that the catches are going up, and is that an increase in effort or an increase in stock abundance, and the SERFS index indicates that it might be an increase in stock abundance. I just don't know about a trap index for almaco jack. That kind of bothers me, and I don't know if there's been a behavioral change in the fish or something different is going on, but I just don't see the trap as being a good indicator for almaco jack, but maybe it is.

DR. AHRENS: Just to help Fred out, the 2018 point goes back up, and the 2019 is above the 2018 on the current biomass estimate, but below it on the numbers estimate.

DR. SERCHUK: I stand corrected, and that would mean five years of data above the suggested new ABC/ACL, and so, if I were a manager and was faced with that, given the guidelines that managers have to conform to, that would suggest that overfishing is going on in this resource.

DR. SHAROV: I probably would disagree with Fred on this, and so we have a continuous trend in increasing overall landings, at least in terms of weight, and, therefore, whatever the reference period was, it was not applied to like a stable, no-trend situation here. Therefore, it was not truly representative of some sort of stable condition, quasi-equilibrium, and I am using this too often today, but you get the idea. We have fishery-independent data that suggests that the stock has increased in numbers, and we have a speculation, a reasonable one, that the effort could have increased, but we don't have an estimate of it.

I don't know if it's possible, in principle, and, if we're so much interested, one could try to -- If they identify the APAIS intercepts as the Primary 1 and Primary 2 species, then somebody could calculate catch per effort using directed trips and see if that effort had a trend and if there have been indications of an overall increase in effort, and so I am not totally convinced that there is overfishing happening. There is data that says the stock has increased, and should we be cautious anyway? Yes, probably, but I think we should rely on the data.

DR. SERCHUK: As much as I would like to agree with my colleagues here, the managers have no choice, it seems to me. I mean, the ABC is the ABC, if they accept it, and then you gauge what the catches are against the ABC, and, if it's above, continuously above, I would submit that the managers would need to take some action, unless we somehow caveat that, while this is a soft ABC or so on and so forth -- I mean, there has to be some information to mitigate what in a normal case would suggest overfishing, and maybe it's the quality of the information, and maybe it's not, and I don't know, but, again, we're giving managers presumably either our best assessment of what the ABC should be, and we do it for other stocks, for which we have more complex information, and so I'm just a little bit concerned now that it's going to be five years above this line, and so it's not a transient experience, where it goes up and then it goes down, and I get back to my question. Given that sort of -- If we agree upon that, what is a manager to do?

DR. SCHUELLER: I just wanted to clarify -- The report, trends report, does not have an index in it, and it has changes in mean total length over time, which we could argue quite a bit about what might tell us or not tell us too, but there is no index, and so I don't -- There is no fishery-independent data on the table showing relative changes in abundance, and so let's make that clear.

The second thing is I am getting wrapped around the axle about how these are a complex, and so this is a complex again, and so, again, the individual species versus the complex. If you look at the complex figure for this, there is an old -- I am not really sure what's on the table, or the figure, and I don't think that the plot of the new data is in there. Anyway, I respect this discussion about this individual species, but this isn't an individual species, and it is a complex, and so I am getting to what should we do with a complex, and it looks like, based on what I think is the old data in the figure, unless I am missing a figure, but they are sort of bumping up against that ABC for the whole complex in the most recent years, but not necessarily going over it routinely. I don't know what it looks like with the new theoretical purple line, because I don't know what that purple line is, but --

DR. ERRIGO: That is an oversight, and I don't know how I did that, but I can replot it fairly quickly.

DR. SCHUELLER: I mean, it's possible that we're seeing some building new fishery that is occurring, and then it's perhaps reaching some place where we have designated as MSY, and so some management action needs to be taking place on an individual level, and I have no idea how the -- Just as we have discussed the ecosystem component part, I don't know how these were designated as complexes and what the work would be to -- If we believe one of them is having an issue, how that would be treated, if we could pull them out from the complex or what.

DR. BUCKEL: I think we made a note on almaco that there is evidence that there is more directed targeting, and so that would be one recommendation, or potential action, is to remove them out of this complex and deal with them as a single species.

DR. SEDBERRY: From what I've been hearing too -- When we had the climate vulnerability workshop a couple of weeks ago, there was a lot of discussion about almaco jack and its being targeted in spawning aggregations, and being targeted, and so I think there is more of a directed fishery now than there used to be, and I'm sure the AP could fill us in on that, whatever AP it is that has jacks, and is that Snapper Grouper? I don't know, but, anyway, I think there is more directed effort, and it certainly can be identified in the landings by fishermen and biologists, and it's being identified and being reported separately, and there is life history work being done, or has been done, and so, yes, I think it should be pulled out. Again, I don't know what that whole process -- Like Amy was saying, I don't know how the complex was set up, and I don't know what the process is to do that, but I think that would be a good recommendation from the SSC.

DR. ERRIGO: Just so everyone knows, I -- This is the graphic of the new total landings for the new total ABC, and the lines underneath it are not redone yet, but the total landings and the total ABC are from the new data. This is the new ABC.

DR. SEDBERRY: Thanks, Mike.

DR. DUMAS: Looking at the commercial landings for almaco, there is sort of a steady trend up until 2012, and then there's a pretty steady trend down since then, and so are you saying that the increased -- I guess anecdotal increase recreational targeting started occurring when? Do we know? Is it the last five years or the last -- Is that what you were talking about earlier, Jeff?

DR. BUCKEL: We would have to get some folks from the fishery to -- That's just the anecdotal reports that I've heard, and I don't know when that started. Good question though.

DR. DUMAS: My point was just that the trend in the commercial landings recently is different from the trend in the recreational landings. The commercial is trending down, and the recreational is trending up, and so, if the stock abundance were increasing, I would think you would see increasing trends in both of those, commercial and recreational, all else equal.

DR. BUCKEL: There may be an issue with the commercial landings, because of the quota being hit, and I think we talked about that. There's been a couple of years where the jacks complex has been shut down.

DR. ERRIGO: Yes, there have been several years of commercial closures for the jacks. Actually, the jacks have closed early since the ABC and ACL have been in place in 2012, commercially. It's been sometime between June and August.

DR. SERCHUK: What decisions we make here have ramifications, and that's all I'm trying to get at. If we believe and accept the new ABC, and the catches remain above it, then, typically, that will require some management action to reduce those catches to at or below the ABC. If there are mitigating circumstances, either with the data, with identification of the species, with the integrity of the datasets, that would somehow allow for a contingency against taking what normally would be the required action, then we need to explain that, and so I am just trying to get some information from other members of this committee, who might be more familiar with these fisheries, what those mitigating factors might be against taking action if we accept an ABC where the catches are likely to be above that.

DR. CHEUVRONT: I just got a phone call from one of the council members, Chris Conklin, who wanted me to get a comment in for him about almaco jack, and he was saying that one of the issues economically for this is that part of the time what happens is that the price of the almaco jack -- They are competing with folks from the Gulf, and sometimes the price just drops for these fish, and so they have a real hard time marketing them, but he says they never have a problem with them being confused with amberjack or anything like that, and so that's not an issue, and so therein lies part of the issue on the commercial side and why the commercial landings are down, and it's because there is just no economic value for those fish when they are competing against the Gulf side.

DR. SEDBERRY: Thanks for that info. While we're thinking about jacks, I'm just going to throw out here that we're getting really close to lunch, and everybody's blood sugar is getting low, and then, on our agenda, we have a scheduled webinar speaker at 1:30, and we can't really change that, because he's in a different time zone, and, of course, it's on a totally different agenda item, which makes it a little difficult, but I think what we're going to have to do is -- Maybe if we can just wrap up the jacks before lunch and then move on to the other agenda item at 1:30 and then come back to the rest of the ABC issues later this afternoon.

DR. GRIMES: Can I ask a question about the jacks? The SERFS index, some people said there was not one, and some people said there is one.

DR. SEDBERRY: There is SERFS data, but there's no index.

DR. ERRIGO: There is no standardized index. There is a nominal index, but it's not for every year, and so it wasn't put into -- The data is in a table, but it's not -- There is no graphic with the standardized index.

DR. SEDBERRY: It's not even standardized by number of fish in the trap.

DR. GRIMES: It is the trap index, and it's not the video?

DR. SEDBERRY: It's trap catches, and it's not an index. It's just the trap catches.

DR. ERRIGO: Maybe, before we break for lunch, can we just get agreement on banded rudderfish and lesser amberjack? Lesser amberjack, there is almost no difference between the two data streams. It's very rare. There was a slight increase in the average landings from the reference period to recently, but that could just be due to the high variability. Sometimes it goes up, and then it comes down and goes up and down.

Then, for banded rudderfish, the workgroup did say to note the declining trend of the most recent years. However, it does uptick in 2017, and I don't know what the 2018 data show, but that could just be coming up and then down, and I'm not sure. Are we good with using the third-highest from the reference period for these two species?

DR. SEDBERRY: That seems reasonable. Any objections to that? So, the reference period and the new ABC, we're good with those, for just these two, lesser amberjack and banded rudderfish. Great. When we come back from lunch, we still need to finish off the jacks, or do we --

DR. ERRIGO: Well, there are two species left that need to be discussed, almaco jack and black grouper, but we do have a presentation that needs to be done, because the presenter is on the west coast.

DR. CROSSON: I just told him 1:30, and so we're doing it at 1:30.

DR. SEDBERRY: We have to do that at 1:30, and this has to do with the National Standards and carryover and phase-in of ABC, and so it still has to do with ABC, but some other things as well, and so we're going to have to kind of switch topics and then come back to this, and that will also require a public comment period on the presentation and all of that, and so we're going to have some interruptions, but maybe it will actually clear our brains a little bit, and, when we come back to these ABCs, we can just knock these last two things right out.

DR. SCHUELLER: Can I just ask one clarifying question? Some of the species were moved to ORCS, and some remained on the decision tree, and what was the decision point on which species went where?

DR. ERRIGO: There is a list in one of the documents that shows why species were moved, and I that somewhere, and I can get that to you, but, for instance, almaco jack did not go over to ORCS, because of species ID issues, and I don't remember, offhand, all the reasons for all the species, but a lot of them were species ID issues, and there were a couple of other issues, and I don't remember them off the top of my head, and I don't know if Jeff has any better recollection.

DR. BUCKEL: No, and I just wanted to -- I mean, at the basic level, the ORCS is when we felt like the catch was reliable, and the decision tree was when we weren't confident in the catch data, and it wasn't reliable, and so the main reason that I remember, when it wasn't reliable, was because of the ID issues and not the PSEs, which we may move towards.

DR. SEDBERRY: Okay. Let's recess for lunch, and we'll be back at 1:30, and we'll start right on time, because we do have a -- Let's come back at 1:25, and we will start on time, because we do have a webinar presentation.

(Whereupon, a recess was taken.)

DR. SEDBERRY: If everybody could please take their seats, we are ready to reconvene the SSC, and, as I mentioned before lunch, we're going to shift things around a little bit, and so we're now moving to Agenda Item 5, which is Review Draft NS 1 Guidelines on Carryovers and Phase-Ins, and, Scott Crosson and Alexei, if you would please take notes on this presentation and discussion. This will relate to the ABC control rule discussion for some approaches, and we have a presentation on this, and the documents associated with this include Attachment 8, which are the draft NS 1 Guidelines on carryovers and phase-ins, and then we're going to have a presentation.

DR. ERRIGO: From Dan Holland.

DR. SEDBERRY: From Dan Holland at the Northwest Fisheries Science Center, who is going to run through the highlights, and then we have one action item associated with this, and so we will hear the presentation and then take public comment and then address the action items, and so, Dan, if you're ready, I believe we can proceed.

DR. ERRIGO: I just need to transfer control over to Dan. Real quick, I recalculated the knobbed porgy ABC, and here's what it looks like, just so everyone knows, and this is using the scamp methodology.

REVIEW DRAFT NS1 GUIDELINES ON CARRYOVERS AND PHASE-INS

DR. HOLLAND: I am Dan Holland, and I'm an economist at the NOAA Fisheries Science Center here in Seattle, the Northwest Fisheries Science Center, and I am also the Chair of the NS 1 Technical Guidance Workgroup Sub-Group 2, which is working on carryover and phase-in, and I believe my collaborator, Deb Lambert, who is at Headquarters, is on the phone as well listening, and we've been tag-teaming on some of these presentations.

What I am presenting on today is basically a tech memo that the sub-group has been preparing to provide technical guidance for designing and evaluating and implementing carryover and phase-in provisions within ABC control rules, and there are a number of different authors on this, mostly

with different parts of National Marine Fisheries Service as well as some council staff people, and so I just wanted to note here that there are a lot of people involved, including one of your own, Scott Crosson.

Just to give you a little background here, the National Standard 1 requires that, as you I'm sure know, that fisheries management prevents overfishing and achieve optimum yield. Those guidelines were most recently revised in 2016, and, within those revisions, there was some new guidance about phase-in and carryover that creates a little bit more flexibility in accommodating phase-in and carryover in setting ABCs, and that's the subject here of what we're talking about.

The two main changes then that I am going to be discussing here are, first, phasing-in changes to catch levels, and this diagram presents what I'm talking about here. By the way, since I can't see your faces, it's hard for me to be certain that you are following, and so please pipe up if you have any questions during the slides, or we can talk afterwards as well.

This first diagram is kind of showing an example of what the phase-in might look like, and so, in this case, we have the OFL has been going along, and it's taken a drop, and let's say a new assessment has come in for a three-year period, suggesting that the OFL needs to drop, and therefore the ABC would drop along with it. Typically, these would be done in lock-step with a typical ABC control rule that would account for the uncertainty. What this is suggesting is that you could set an ABC -- You could set a higher ABC or ACL above what the old ABC would have been in and phase that in over three years, that black line there.

The key thing to note here is that the ABC cannot exceed the OFL, and so it's just you basically have that margin between what the ABC might have been otherwise and the OFL, and that phase-in can be done over three years. Now, this is an example of just sort of a one-off situation, where an OFL dropped, but, as we talk about in the tech memo, you could actually build in an ABC control rule that would sort of automate this, like in an MSE framework, where you maybe have a rule that tries to moderate changes in ABCs or ACLs over time, and you could develop something that would allow phasing-in changes like that as part of that sort of a more automated ABC control rule.

The second subject, really, or second main provision that we're talking about in these new guidelines, is the carryover provision, and the diagram here basically shows how carryover was used in the past, or could have been used in the past under the old guidelines, and carryover was allowed in the past, but it had to be done only within a margin between the ACL and the ABC, and so, in this case, you can see there was some uncaught catch in year-one, and we were able to carry over part of that, because there was a margin between the ACL and the ABC that that extra catch could fit into without actually changing the ABC.

Under the new guidance, you can actually change the ABC to accommodate that carryover, and so you still cannot exceed the OFL, just like with a phase-in approach, and the OFL itself is sacrosanct, but you can potentially increase the ABC to accommodate that carryover-caught catch.

There were three different workgroups, actually, that were put together to create technical guidance for the new guidelines, and there were three different groups, and they were reference points, and Sub-Group 2 was carryover and phase-in, and then there was a third one on data-limited stocks. I

am the chair of this workgroup on carryover and phase-in, and that's the subject of the tech memo that we're talking about now.

This tech memo, which I believe you have, and has now been circulated to the SSCs and council staff, it's already been through several rounds of review and editing within the agency, and now we're sending it out to the councils and the SSCs for further comment, and we're hoping to finalize this over the next I guess six months or so, but this tech memo provides examples of carryover and phase-in provisions, and it shows how it's been used in other countries, as well as the U.S., and it talks about different approaches for implementing and evaluating carryover and phase-in within an ABC control rule, one-off kind of approaches, and it also has some discussion of the characteristics of fish stocks and fishery management systems that impact both the risks and the benefits of carryover and phase-in.

The document is -- The tech memo is non-prescriptive, I would say, and it's really more informational, and it does provide guidance, but I think, as you read it, you will see that it's not really prescriptive, and it allows quite a lot of flexibility about how you would go about this, and so why would we consider carryover and phase-in? Well, in the case of carryover, one of the main reasons that carryover has been used in the past, or used in other fisheries, or you might want to consider using it, is for safety.

The argument is that, if you have -- If fishermen are able to carry over some of that uncaught catch at the end of the year, this may help with safety, because, otherwise, they would be incentivized to go out and fish out potentially in poor conditions, bad weather or racing to fish to catch the last of that fish at the end of year. If they're able to carry it over, they wouldn't have to do that, and it could help with economic stability, again, sort of relating to potentially catching a lot of fish at the end of the year, perhaps when it's not as valuable or when it would create a market glut.

It can create some stability in the management system, and a potential example here is that, in a situation where you have short openings, like the halibut fishery used to be, for example, and you might have a little bit of catch at the end, instead of having another real short opening, you might be able to -- Managers might carry that over into another year.

Carryover is also used quite commonly in multispecies catch share systems, and the reason being that individual fishermen, with their portfolio of quotas for different species, typically would have a hard time matching that catch exactly to that portfolio of species, and so they're going to end up with a little bit of some species, and you don't want them, necessarily, to go out there and try and catch every last bit of everything, because they're going to end up having to discard other species, potentially. Allowing them to carry over some of that uncaught quota is easier for them, and they wouldn't necessarily then have to try and find buyers for that quota or sell it to someone else who might not want to buy it at the end of the year.

Carryover has been used quite a bit, both in the U.S. and abroad, and we go through a number of examples in the tech memo, and I won't go into great detail right here, but I will note that New Zealand, Canada, Iceland, and Australia all use carryover in their IFQ systems. Typically, these are limited, in terms of how much can be carried over. Anywhere from 10 to 30 percent is usually allowed, and I believe British Columbia and Canada allows a 30 percent carryover, which is one of the higher rates, and carryover is also used in the North Pacific halibut and sablefish IFQ, which actually allows carryover in both directions, the Pacific groundfish IFQ, New England

multispecies sectors, and in the scallop IFQ, as well as in the limited entry, and so, there, it's a days-at-sea carryover, rather than the actual quota. There is carryover allowed in the Atlantic HMS shark fishery, provided that it's not overfished, and that actually allows quite a high level of 50 percent, and the Gulf snapper and reef fish IFQ also has a 10 percent carryover.

I will note that there hasn't been a lot of analysis done of sort of the effect of having this carryover, in terms of sort of risk or benefits, in terms of quantitative analysis in the literature, and what the tech memo goes through is mainly descriptive, of how these things can be used, and there's not a lot of strong evidence out there one way or another about the risks and benefits of these.

There are basically kind of two general approaches to implementing and evaluating carryover. The NS 1 Guidelines advise that you potentially use an ABC control rule, which would describe when the carryover provision can and cannot be used, and it would conduct a comprehensive analysis, and it should consider reasons why there was an underage in determining whether or not to allow carryover, and it should also evaluate whether it's appropriate for overfished or rebuilding stocks.

It's not saying that you can't use it for overfished and rebuilding stocks, but just that you should evaluate it. In the tech memo, we have some additional factors that we suggest that you would consider, and, again, which stocks are eligible should be defined in an ABC control rule. How you're going to actually determine any underages and when and how should be laid out, and, if there are multiple fisheries sectors, you need to know how to -- It has to explain how that's going to be dealt with.

There may be -- You may want to specify if there is a limit to the amount of carryover. As I mentioned, most carryover programs do limit to 10 or 20 percent, and 10 percent is the common amount in U.S. fisheries. There should be a process for making changes to the ABC and the ACL laid out, and, ideally, this would be evaluated with some type of a management strategy evaluation simulation to test the robustness of this approach, to make sure that it's not creating undue risk of overfishing. Then there should be a consultation with the SSC and applicable NMFS Science Centers.

The other approach to allowing carryover is just to do it on a case-by-case basis, and, obviously, this is going to be more labor intensive. Instead of having a more automated process, it would have to be reviewed, presumably by the SSC, each time, and, ideally, you would rerun projections that were used in the last assessment with the revised catch estimates, to make sure that overfishing was not going to be occurring as a result of allowing this carryover.

It might be possible to do some scenario planning, and that's one thing that came up in our discussions, is that, if projections are being done after an assessment is done, it might be possible to run projections that simulate various scenarios where carryover happens, and that's just to show that, if catch didn't happen, like say it was 10 percent under one year and then 10 percent over the next year and such, all the different possibilities there, that you didn't end up with a situation where catch exceeded the OFL.

Switching gears here to phase-in, the benefits of phase-in are, in some ways, similar, or some of them are similar, but it's mainly about creating stability for having more stable ACLs over time, and this can help for the industry and in terms of developing markets and having more stable ACLs, and that's often an interest when management strategy evaluation are used, where control rules are

set up in order to try and create a more stable TAC over time, and it can also be easier for managers. If you don't have to deal with large changes in ACLs over time, it's easier for managers to implement management.

Again, the tech memo goes through a number of examples of how phase-in is used abroad and in the U.S. In the U.S., it's mainly been kind of one-off cases, where we're looking at cases where the assessments come in and we have a decrease in the OFL, which would require potentially a large decrease in the ABC, and they then wanted to phase that in, to sort of reduce the shock to the industry and communities.

Some of the examples that we go through in the tech memo relate to the use of phase-in type arrangements that have been looked at with a management strategy evaluation. As I mentioned before, a common thing to look at with management strategy evaluations and control rules is to find control rules that can create more stability in the allowable catch over time, and so you can imagine then looking for a control rule like this that limits the amount, and specifically, this is sort of a common approach with these MSE control rules to limit the percentage change of the TAC or limit how often the TAC can be changed. This is potentially permissible with these new guidelines, but you would need to use like a management strategy evaluation simulation to ensure that using this new control rule wouldn't result in overfishing.

Again, there are sort of two main approaches to implementing the phase-in, and the first one, and the preferred one, is to develop an ABC control rule. As for the carryover, the NS 1 Guidelines advise, in general terms, how to do this, and it should describe when the phase-in provisions can and can't be used and conduct a comprehensive analysis, ensure that the phase-in time does not exceed three years, and it would also ensure that overfishing does not occur in any one year, and that is a strict requirement, that the ABC can still not exceed the OFL, and, again, evaluate whether this is appropriate for overfished or rebuilding stocks.

In the tech memo, we have some additional factors that we talk about, and, again, you should lay out, within the ABC control rules, which stocks are eligible, and you should potentially consider both phasing-in increases and decreases to the ABC. If you phase-in only decreases, but not increases, this could increase the risk associated with allowing phase-in. You might want to consider maintaining a minimum buffer between the ABC and the OFL, and that's not a strict requirement. The ABC could actually equal the OFL, but it just cannot exceed it.

The generation time of the stock assessment and the length of time between the assessments should be considered, and it would be ideal to evaluate this with a management strategy evaluation to test the robustness of this approach to uncertainty.

You can also implement a phase-in on a case-by-case basis, for example when a new assessment comes in and shows that maybe a large drop in the OFL has occurred, and you want to phase that in. In this case, presumably, you would want to then run projections based on that most recent assessment with the new proposed ABCs, again to ensure that they are, with some level of certainty, not exceeding the OFL.

The last bit of the tech memo then has a discussion of various characteristics of fish stocks, and also the fisheries, the way the fisheries are managed, that impact both the risks of carryover and the benefits also of carryover and phase-in, things like life history characteristics, and so, with

short-lived stocks with high natural mortality and not many cohorts there on the ocean, carryover and phase-in may be more risky. Stock structure and spatial dynamics can affect the risk. If stocks are jointly targeted and they're bycatch, that can be both a -- It can create a risk and also a reason for allowing carryover. Carryover can be important particularly, as I mentioned, in an ITQ fishery, multispecies ITQ fishery, sometimes to carryover stocks that are primarily caught as bycatch. On the other hand, if you allow carryover for one species, and like if there's one target species, you've got to consider the fact that it may create risks for other species that are caught along with it.

The assessment availability and frequency are also important things that are going to affect the risks and benefits of carryover, and the likelihood of ACL overages and catch uncertainty. One sort of thing that came up in our discussions of the technical working group that's a little bit ironic is that, in fact, when you have a stock for which the assessment is uncertain, you actually have more leeway for carryover or phase-in, because there is typically a larger gap between the ABC and the OFL, and that's just because of greater uncertainty, and so, in fact, in this case, where you actually have more uncertainty, you have more flexibility to allow a higher percentage of carryover or phase-in. We are not saying that that's necessarily a problem, but it is a little bit ironic, and so we definitely want to be careful, in cases where we have a lot of uncertainty, that we're taking that uncertainty into account and ensuring that overfishing is not going to occur.

The next steps, in terms of this technical guidance and the tech memo, is we have made this available now, and we're giving presentations to the SSCs from all the different councils, and we plan to -- I don't think we plan to present to the CCC in November, or maybe we still do, and I'm not sure, but, in any case, we hope to finalize this in January and get the -- I am thinking that this schedule may be a little out-of-date, and I might not have changed that last slide, and so we may be a little bit behind this schedule now, but, in any case, we are looking for comments from the SSCs, and we hope to finalize this tech memo in the winter or spring, and so, with that, I will open it up to questions.

DR. SEDBERRY: Thank you, Dan. That was a very nice summary of the issue and the technical document, and so, as Dan mentioned, he is presenting this to the SSCs, and the council is going to take up this document and the SSC's comments on it at their December meeting, I believe, and so at the next meeting of the South Atlantic Council, and the council will review these guidelines, these draft guidelines, and our comments or recommendations on the draft guidelines, and so, before we begin our discussions and look at the action items, I want to see if there's any public comment on this agenda item and the presentation. Okay. We have no public comment. Our action item here is to, again, review and provide comments and recommendations on the draft NS 1 Guidelines, and so this is a draft.

DR. ERRIGO: Dan, I just wanted to let you know that I'm going to take control back, as long as you don't need the screen anymore.

DR. HOLLAND: No, not unless there is any specific questions about any of the slides or anything.

DR. SEDBERRY: While we have Dan on the line, let's make sure there is no clarifying questions or any other questions or discussions for Dan first, to make sure we understand what he has presented and see if we have any follow-up questions for him.

DR. NESSLAGE: In the conclusions, you talk about recommendations to incorporate retrospective patterns into the projections, to incorporate greater uncertainty, and I'm familiar with John Weidman's work, but I am just wondering if you have more specific recommendations for how that exactly would be done, and I assume it would be done on a council-by-council basis differently, because they handle projections differently at each council, and so I was just curious if you guys had any more concrete quantitative suggestions for us on how to tackle that, either nationwide or in the South Atlantic.

DR. HOLLAND: I would say that no, we don't really have any. At one point, we were kind of looking at potentially trying to do some examples, based on the way that assessments and projections were done in different regions, but we basically didn't have the time and the resources to do that. I have done some work -- We have done sort of a basic MSE with Weidman on looking at carryover risks, but, because things are done differently in different regions, we are trying to avoid being prescriptive about how you would actually go about that and just kind of give examples of what you would do, and so I guess I don't really have a lot more to add there.

DR. ERRIGO: There was someone online who was just saying that the deadline for turning in comments and revisions is January 15, 2020.

DR. HOLLAND: I think I had that outdated slide there as my last slide, and that deadline has been pushed back a little bit.

DR. DUMAS: I have got a question about the carryover. As you current envision it, can carryover be carried over for more than one year into the future? That's sort of the first question, and a related question is can carryovers be phased in, and so, if you decide you want to do a carryover, can a given carryover be allocated across several years into the future, to make the carryover less discreet and make it sort of a smoother carryover? Thanks.

DR. HOLLAND: Well, I am less certain about the second question. The first question, the way that we discuss it in our guidance is that carryover should only be used for one year, and so you can't carry over carryover, and that's the way that they have typically been used elsewhere around the world, and, in terms of phasing them in, I guess, essentially, that would be like -- It would really fall under the phase-in rules, and, I mean, I suppose, if you wanted to adjust your ABC to phase-in -- I don't know. That seems a little but murky. We don't address that directly, in terms of whether you could phase-in a carryover over time, but, basically, our guidance is that carryover would be for a single year and that you would not carry over carryover.

DR. DUMAS: Thanks.

DR. SHAROV: A couple of questions. On the overfishing, there is the requirement for overfishing not to occur during the carryover process, and that shouldn't be happening within a year, and I wonder, when you say this, is the uncertainty part of this determination, whether the overfishing has occurred, as a standard approach of using a single point and essentially a 50/50 percent chance of overfishing, and would that be the formal definition, or would the probabilities of overfishing be established by the council or the workgroup or whatever, and that's number one. Do you have any comment on this?

DR. HOLLAND: Your SSC or your council figures out the OFL, and I think, typically, the OFL is figured without any risk, or it's basically looking at that 50 percent chance of it being -- Of overfishing not occurring, is how that OFL is set, and then, typically, the ABC is set with some kind of an increased buffer below that, right, and this allows you to raise the ABC somewhere within that buffer range.

DR. SHAROV: So you envision that the recommendation would be to allow for flexibility and to allow the councils to determine their level of certainty that they are not overfishing. Thank you. The second one was, on the application of phase-in in the other countries, my impression, based on how you presented it, is that, in South Africa or New Zealand, or whoever is in the forefront -- Like you said, they usually tested this with MSE, and do you anticipate that that should become a standard process? In other words, should and are the centers or the SSCs or people that will be doing assessments -- Would they be required to do the MSEs, and what is the role of MSE, and how certain that they will become a part of the standard process, because that means a lot of work to be done in a short time.

DR. HOLLAND: The guidance does not prescribe that. There is no requirement to do an MSE. There is a requirement to do a rigorous analysis, but we recommend that an MSE, or an MSE-like analysis that accounts for uncertainty and a simulation analysis that accounts for uncertainty, would be ideal, and, particularly, I think, if you were going to use some type of a control rule that automated changes, phasing-in changes of ABCs, potentially, both up and down, to try and stabilize catch over time, but that is not a requirement, and you can also continue to do these on a case-by-case basis, and it simply requires a robust analysis of the risks of doing so, but what exactly that entails is not prescribed.

DR. SERCHUK: I have another technical question. Councils differ on the specification-setting periods. Some set specifications every year for stocks, and some set specifications for two years, and some set specifications for four years. I wonder whether there have been any evaluations done, because I presume, if the specifications are set for four years, and that there is a case that could be made for, in the third year, having carryover for the fourth year if you haven't reached the ABC for that year, but I am also worried about the propagation of error when, for example, this council may be doing assessments that are through 2017, and we have two years of interim data, of catch data, and we're setting specifications for 2020 to 2022, and it's been my experience, in many of the stocks that I have looked at, that the specifications that are set for the outer years often become very dependent on the recruitment assumptions that went in four years before that.

I am just wondering whether there have been any evaluations done on this, because I think the uncertainty, in terms of the catches that are projected for the outermost years, are more uncertain than the catch projections that would be done on an assessment done every year for the next year, and that, to me, would be something that a carryover might be a concern for when you are dealing with a specifications period, and let's say it's four years, from 2020 to 2024, and that 2023 and 2024 projected catches, under an ABC, might be very much different, because recruitment assumptions that would be coming in at that time could be very different. I know it's a technical question, but I am asking whether there has been any thought about these types of things with respect to carryover in the last years of a specifications period. Thank you.

DR. HOLLAND: Well, I think there's been some talk about it and discussion about it more in general terms and that -- I think the tech memo does discuss those issues, where you have -- The

length of time between assessments is greater, and that you need to account for that, for more uncertainty there, and I know, specifically for the Pacific Council now, we have just implemented a new ABC control rule, basically, that increases that buffer between the OFL and the ABC based on how long it's been since there was last an assessment, and so, each year since the last assessment, that buffer increases by some amount, and I think it's linear, to create a larger buffer.

Now, in terms of -- That would potentially affect the phase-in, because -- I guess it would create a larger flexibility for the phase-in there, in a way, but, in any case, you wouldn't be able to do a phase-in four years out, and you would only be able to do it three. In terms of the carryover, I don't think we really discussed that explicitly, in terms of carryover four years out, and carryover is a little bit different, in that carryover is only being allowed if it's fish that was uncaught, and so I think the basic assumption is that is catching fish one year versus the next year, as long as the total amount over the two years is the same, shouldn't really matter that much, but that is something that you should test with some type of a simulation approach or projections, to ensure that that isn't going to be a problem.

Now, obviously, if you have a long period between when the ABC is implemented versus when the assessment was done, and even longer because of the delay, in terms of getting the data that goes into it, there is more uncertainty and more risk, and that may be a reason to be more conservative with your ABC control rule relating to carryover.

DR. SERCHUK: Thank you.

DR. SCHUELLER: I had two questions or comments, and maybe you can speak to each of them. The first is this entire document seems to be predicated on the assumption, at least from my read of it as an assessment person, that you have an age-structured assessment model, and a lot of the species that we deal with do not have that, and so, today and yesterday, we have spent a ton of time working on ABC recommendations based on ORCS, and so there's not -- I didn't see any recommendations in there based on basically different types of ABCs, and therefore different types of ACLs, that are being used by the councils. Then the second question, or comment, is it seems to me that, in there, when it talks about ACL overages, it is a one-to-one payback, and what's the justification for that?

DR. HOLLAND: To your first question, I don't think that -- This isn't predicated on there being an age-structured assessment. We have deliberately not been prescriptive about when it can be used, because the guidelines do not suggest that it can only be used when you have age-structured assessments, and I think the guidance is that you should take what type of assessment and the uncertainty associated with that into consideration if you put in a policy like this, and you should have some means of -- The guidance is conduct a comprehensive analysis, but we're not strongly prescriptive about what exactly that is, because of the different situations different stocks and SSCs and fisheries are in.

In terms of the one-to-one issue, the guidance allows for a one-to-one payback, but we also suggest that you should be looking at the specific characteristics of that stock, to make sure that that makes sense and doesn't incur overfishing. In some cases, if you, for example, have a stock where the stock is growing faster than -- If it's growing faster than the fishing mortality would have been, or the natural mortality, then you would potentially have more fish out there to take and so then if you caught it prior year, and so a one-to-one payback may make sense, or it may be even

conservative, in a sense. In other cases, that might not be true, for a short-lived stock, and you might not want to allow that, and so that's why you need to do a comprehensive analysis with the particular stocks that you're dealing with and lay out for which stocks it should be allowed or if, in some cases, you might not want to allow a one-to-one payback.

DR. DUMAS: In your review of carryover in the U.S. and abroad, where you're looking at the IFQ fisheries, in those cases, is the carryover individual-specific, or is the carryover for the whole fishery? If you have a 10 percent carryover, can different individual fishermen have different carryovers, or is a carryover determined for the whole fishery and then allocated proportionately to the fishermen in that fishery, in terms of their individual IFQs?

DR. HOLLAND: In the catch-share fisheries, it's typically on an individual basis, and so each individual can carry over up to 10 percent of their own.

DR. DUMAS: Great. Thanks. A follow-up question is are those carryovers tradable?

DR. HOLLAND: Well, typically, they're not. Well, they are, in the sense that, once it's been carried over -- In a typical situation, where you have sort of the annual forms of quota and the shares, you get your annual form of quota, whatever you call it, and here they call it quota pounds, and, at the end of the year, if you hadn't used some of that, you could carry over up to 10 percent of it.

Then, the next year, that's going to be issued to you as the next year's quota pounds, and so you could trade those at that point, or you could have traded at the end of the year. You could have traded those quota pounds away to someone else, and perhaps that might change what they can carry over, and, in fact, in British Columbia, there's a lot of that trading that goes on at the end of the year, so that everybody can kind of maximize out their carryover, and that's not the way it has played out, necessarily, in other places.

DR. DUMAS: Thanks.

DR. SHAROV: Dan, a follow-up question. What's the origin of this 10 percent limit for carryover? Has it been based on any calculation, or is it just sort of a subjective and reasonable and cautious limit of how much people are willing to allow to carry over into the next year?

DR. HOLLAND: I have never found any documentation that it was anything other than an ad hoc and kind of what people thought was a reasonable amount, and 10 percent is a common number, but you see 30 percent in British Columbia, but I haven't seen -- In the literature review we've done, I wasn't able to find anything that really documented a good reason for choosing a particular amount.

DR. SHAROV: So will this number then be open to comments and revisions if the SSC or somebody else would be willing to say how about making it more flexible and, for some species, some regions, a carryover based on the performance of the fishery could be 20 percent or 25 percent, and I don't know, but what did the workgroup say about it?

DR. HOLLAND: Well, the workgroup did not specify an amount that you could carry over. We just said you should consider setting some limit.

DR. SHAROV: Thank you.

DR. AHRENS: Dan, is there any concern that, by establishing kind of the notice of phase-in and carryover for targeted species, that this could spill over into asks for protected species take and carryover there?

DR. HOLLAND: Is there concern that that would -- That allowing this carryover for a non-protected species would create more catch of the protected species, and is that what you're saying? I'm not sure if I understood your question.

DR. AHRENS: No. Would it create kind of a push to start to look at carryover for protected species?

DR. HOLLAND: Well, that seems to be sort of a -- I think that's beyond the mandate of the guidance and the tech memo here, and that question actually came up yesterday at the Pacific Islands presentation, whether this would go toward protected species, and I think it depends on what you mean by protected species, and so, for example, on the west coast here, Pacific halibut is a protected species, in the sense that you're not allowed to catch it with trawl gear, but it's also a targeted species, and it has an ABC, and they do allow, I think, the carryover for that, but, in terms of allowing it for say marine mammals or something like that, there hasn't been any discussion of that, and I don't think that this guidance applies to that.

DR. SEDBERRY: Any other questions from the SSC for Dan? Very good. Thanks so much for your presentation, and, again, it was very informative and a good summary of the guidelines and the document, and we appreciate you being able to join us.

DR. HOLLAND: Thank you for the opportunity to do it, and I look forward to any comments, and the working group looks forward to any comments, that you might have for us.

DR. SEDBERRY: Well, we'll be sure and send you our report.

DR. HOLLAND: All right. Thank you.

DR. SEDBERRY: Thank you. Our action item, again, is to review and provide comments and recommendations on the draft NS 1 Guidelines, and, again, the council is developing, as we've mentioned before, this comprehensive ABC control rule, and two of the action items for that amendment are allowing phase-in and allowing carryover, and the council will be using these draft guidelines as they develop that amendment, and they will also be using whatever comments the SSC has on those draft guidelines, and so any discussion? Are there any areas of additional precaution or concerns that we might want to add that are particular to our region?

DR. SCHARF: Just a workload question. All of these recommendations for sort of comprehensive evaluations and case-by-case basis, who is doing that?

DR. ERRIGO: Thanks for volunteering.

DR. SEDBERRY: Who sets the ABCs, because this is part of the ABC control rule amendment, and that's where these things will be phased in, and so I imagine, when ABCs are set, the body that sets the ABCs will have -- They will be considering carryover and phase-in.

DR. SHAROV: Just a quick question to the group. In my mind, to the extent that I know, I think that the carryover probably is not an important, so much important, issue for most of the species, and, if I am totally wrong, please tell me, and that's why I'm asking this question, but is carryover important to the South Atlantic region, versus the phase-in, and I imagine that the phase-in is certainly something that we will be facing frequently, and probably there is more interest in it, but is the carryover a real scenario and for how many species we have an ABC that was, or could have been, carried over in the next year, and that's just a point for discussion.

DR. SEDBERRY: Those are interesting points, and Shep has his hand raised online, and he may be addressing that or something else, but we will hear what he has to say.

MR. GRIMES: I was going to respond to the prior question, and that is who is going to prepare the analyses that are discussed in the tech memo, and that would support -- It would be developed by the council and council staff and the SSC, and it would be, I presume, in the ABC control rule amendment. We would put these provisions in the control rule, and the analysis in that document will have to support how the control rule is consistent with all of our regulatory guidance. Thanks.

DR. SEDBERRY: Thank you, Shep.

DR. SERCHUK: I want to follow-up on the question that I asked over the phone. It seems to me that one of the things -- If the council were to go forward with a carryover, I think they would want to know, based on past experience, whether the carryover would really work, and the sense I'm saying is, in many cases, we have three or four or five years between assessments, and so the ABCs are set for that entire period, based on the projections, and one could go back and, based on an old assessment that was predicted five years forward, then compare what the catches were to what they were projected to be, and if they were over or under, and see how well it would have worked had it been implemented five years ago, based on the subsequent data that we have with respect to how the fishery performed.

That would give some comfort with respect to, well, okay, generally, the projections were right on, or if you were under, and the carryover of 10 percent wouldn't have been deleterious to the stock. On the other hand, if they were under, because, quite frankly, the stock dynamics were not the same, and you carried over, it could be very deleterious to the stock, and so it seems to me that it would be prudent to have these sort of evaluations done retrospectively on certain assessments, to see how well, one, the assessment projections have been, but, second of all, if you're going to use a carryover, whether it would work out successfully or perhaps not well at all, and I think that's an exercise that could be done perhaps in a SEDAR process or by a special workgroup, but I think it's really important to have an understanding of the efficacy of the projection process when you have assessments that have long time periods between updates. Thank you, Chair.

DR. SEDBERRY: Very good point, and we have some stocks for which the ACL is not being caught, and that's a concern, because they're not being caught because they're not there, and so that's a very good point.

DR. CROSSON: I have several comments. In answer to Alexei, we only have one ITQ fishery in the South Atlantic, and that's wreckfish, and they just finished the review, and, actually, carryover didn't come up during the review of wreckfish, but it's something the council might want to consider, because I know that they directed you all to consider making an amendment to make changes to the program, and so that's one thing, is that it could potentially happen, because I know that wreckfish does not always land all of their quota pounds in any particular year, and so the fishermen might be interested in that.

The second factor to consider, and it's mentioned in the technical memo, but it's definitely a minefield in the Southeast, is that this -- If you do carryover when you have recreational fisheries as a large component, that it has the potential for being a hand grenade in the allocation process. The fishermen -- Right here, we have a copy of the National SSC Report that was in San Diego a couple of years ago, and I remember that one of the presenters was from I think Michigan State, and he showed this basically production possibility frontier with a tradeoff between the commercial catch for one of the Great Lake fisheries, and then, also, it was fishing opportunities for the recreational sector as measured by encounter rates, and I think it was something along those lines, and there are reasons that the recreational sector does not want to maximize, in terms of poundage, their catch.

They may prefer to have fishing above what we would normally consider the MSY, because it increases the encounter rates, which is probably a better measure of what a lot of recreational fishermen want when they go fishing, and so they -- If you have carryover, and you have half of the fishery is the recreational sector, and they are not catching their portion of the allocation, which is exactly what we had for some of the pelagics in the Southeast, and you talk about carrying it over, you're going to have to figure out how you're going to deal with that for the commercial sector, who is going to want that extra poundage, because, for them, it is a matter of maximizing the amount of catch, but this is something that's really going to have to go into any kind of decision that we make for any fishery that has a substantial recreational component in the South Atlantic.

The last section is, at some point -- I keep hearing that the Southeast Science Center has a person ready to come onboard to do management strategy evaluations, and so we can start putting that list together for that person.

DR. SEDBERRY: Thanks, Scott.

MR. CARMICHAEL: I just wanted to clarify what you're actually being asked for. You are being asked to comment on these proposed guidelines, and you don't have to get into the use of carryover and phase-in, and you don't have to decide the criteria of when it would be allowed and how it would be done. All of that is in the ABC control rule, and so, if you look at like -- Where they talk about ABC control rule to accommodate carryover, Approach 1, the South Atlantic Council's intent is to do this as part of the ABC control rule for both carryover and phase-in, and so we're following Approach 1, which would mean, in our ideal world, to use this, we wouldn't be in the case-by-case carryover, where things get a little more complicated.

Your focus here should be on this document, and is it clear to you what's expected and what would be expected of you and the council? The council is going to review your comments and discuss this in December and provide comments back to the agency on this draft document, and so, if there are things related to the analysis and such, or the wording in here, or the expectations, that aren't

clear, now is the time to get that up, and then we'll have the knock-down-drag-out about implementing this stuff in the ABC control rule amendment, and, if you recall, we've already had quite a bit of discussion about that, and there's various criteria that are already included for both carryover and phase-in, to get at the idea of making sure that you do this within preventing overfishing, most importantly being that you still can't exceed the OFL.

To me, that's the real line in the sand, and, as long as you stay there, you're probably preventing overfishing, but there is other criteria too about stock status and everything else. In one regard, you've already done a lot of work in that direction, and so just try to focus on this document, and, if you think there is things you would like more feedback from the agency on, or better guidance, that's really the point of this discussion today.

DR. SEDBERRY: Thanks for that clarification and guidance, John, and I think Scott has a follow-up on that.

DR. CROSSON: Dan, are you still online?

DR. ERRIGO: He is not still online. Sorry.

DR. CROSSON: It's been a while since we've had a workgroup meeting, like a year or two, and so I couldn't remember if that issue that I just brought up about the recreational sector and what they were looking for, in terms of how they would think of OY, and I just don't remember if we had that issue come up during the discussion, and we must have discussed it at some point, because I do think it would be important, especially in the Southeast, but that might be something that we might want to flesh out a little bit more in this technical memo.

DR. SEDBERRY: Thanks, Scott.

DR. SCHUELLER: I was just going to comment on the who could do this work part, and I don't think that we're going to be doing MSEs or anything, but it seems to me that we ask for projections from the Science Center, and some of these things could be included in those requests, and, as Scott has mentioned, we may or may not have some mysterious MSE position starting sometime, and so there are other avenues, potentially.

I am going to just comment again on the ORCS-related topic, and I know this isn't directed at -- As he said, it's not directed at only age-structured models, but it is directed at, I think, more full assessments than these data-limited things that are being done, because, as we said in this discussion, with ORCS, they are ABCs, and we don't have OFLs, and so there needs to be some, I feel like, hard lines in the sand, where this will not be used for these types of species, just because they meet the criteria.

DR. NESSLAGE: Regarding the document, I thought the recommendation to include retrospective bias in the projections when setting any -- If you're going to go down the road of using carryover, it's essential, which makes it part of the TORs that would have to occur for all of the assessments, and they would have to be assessments that have projections, and that means that limits us to a very small subset of the species managed by the South Atlantic Fishery Management Council, and so, automatically, you are limiting this to a very small group, as well as my second comment is they do talk about -- I liked what they said about uncertainty in catch, and that's also

a huge problem, as we saw today, in the South Atlantic, given the large proportion of species that are recreational, and small recreational fisheries with high PSEs, and I think it's going to be a real challenge to implement this, but I would encourage the council, if we go this direction, that we take this guidance document to heart.

DR. SEDBERRY: Thank you.

DR. AHRENS: I think the wording in the document is calling for some good critical thinking when it comes to thinking about implementing it, and I think the one thing that I see for fisheries that are dominated by -- They have a lot of recreational in them, and that wasn't addressed directly in the document, but it's kind of covered, and think about it carefully, when you have fairly potentially plastic effort responses, and you could have big swings in effort or responses to the perception of overages being carried over or phased in and that it may create a non-linear response in the effort.

DR. LANEY: I am not quite sure how to ask this question. Should the SSC decide to incorporate -- At least from what I'm hearing, it sounds like the SSC has the opportunity to incorporate some of this guidance in its new ABC control rule and, looking at the carryover percentage that they are saying has been used in the field, basically from 10 percent up to 30 percent, is there any reason why they or why we wouldn't want to look at a lower percentage? I mean, what about 2 percent or 5 percent or 7 percent, and I know, typically, when we go through the NEPA review, you usually have to have a number of different options in there for consideration, and so is that something that should be considered as well?

DR. SEDBERRY: I think, at this point, we don't need to be that prescriptive. I think, at this point, the council is drafting their ABC control rule amendment, and it can be flexible enough to -- I think it will be flexible enough to set those kinds of things as they come up.

DR. ERRIGO: That definitely is a discussion when we're discussing the ABC control rule, and it's not something that needs to go into this document, I don't think, because, in this document, they only gave examples of what's there now, is being used now, and they didn't say the carryover percentages should be between 10 and 30 percent, but they just said here's what is being used in the world right now, and there should be a limit. What the limit is, you've got to figure that out, and so, when we discuss the ABC control rule, I think we're going to have to figure that out, and we'll probably have to do a bunch of analyses looking at different carryover percentages for different species, to see how that will play out.

DR. SEDBERRY: I think what we're doing right now is just offering our opinion to the council whether these guidelines are good guidelines as they develop their ABC control rule amendment.

DR. CROSSON: It's a draft. I mean, whether there's anything else that you think should be fleshed out a little bit more.

DR. SEDBERRY: Right.

DR. LANEY: As a follow-up, I heard Scott say this would be something, possibly, of interest to the wreckfish folks, certainly since they are limited entry, and then I heard Genny say as well that, given that it seems to her that it would apply mostly to those species for which we have really good

assessments, the pool of potential species for carryovers in the South Atlantic would seem to be rather small, at the moment anyway.

DR. CROSSON: It just depends on whether we have a decent OFL proxy, which we don't for a lot of these species. We've been arguing about that for the past day.

DR. LANEY: Well, and I will just say that my bias, my personal and professional bias -- Well, mostly my personal bias, I guess, is I never have liked the concept of carryovers, because I have always, for thirty-eight years, though of things from the fish's perspective, as opposed to from the fisherman's perspective, and so it's nice to give the fish a rest every once in a while, it seems to me, and so, if you have an overage, or an underage, in this case, why not let it go to the stock, as opposed to the fishermen, although I can see how, if I was a wreckfish fisherman, I would certainly want to carry over.

DR. SEDBERRY: Well, it's sort of like letting it ride. It's a gamble, whether it will pay off to the fish, whereas you know it's going to pay off to the fishermen, but good point. Good point. I mean, sometimes it would be nice to have a little extra spawning stock there for the future.

DR. CROSSON: I guess, in theory, it would eventually carry over, because you would see -- If you didn't allow a carryover, and the fishery was -- If people were not catching that amount, then you would expect to see some increase in the spawning stock biomass, and that would show up in the next assessment, and then you could reap it then. It's just such a long delay with so many weak links between that it gets very mushy.

DR. SEDBERRY: Yes, I think you're right. I think, eventually, there would be a payoff, but it might be for the next generation.

DR. LANEY: Isn't that the kind of thing that could potentially be modeled, to a certain extent?

DR. AHRENS: Scott, you may see immediate benefits just in reduced effort to achieve the catch next year, and so your actual cost, your marginal cost, may be lower to the fishermen in the following year, regardless if they got that overage or not.

DR. SEDBERRY: Okay. Any additional comments or recommendations on the draft guidelines that we want to pass along to the council?

DR. ERRIGO: I suggest, as we write the report, that everyone try to fill in this section. I think I gathered the two big bullet points that everyone seemed to agree on, but to try to fill in anything else that needs to go into the document.

DR. SEDBERRY: That's a good idea, yes. Okay. In the meanwhile, back at black grouper, or where did we leave off?

ABC RECOMMENDATIONS FOR UNASSESSED STOCKS (CONT.)

DR. SERCHUK: I have a question, Chairman. A number of us at lunch were a little bit confused of how the ABCs in a complex work and what protection, if any, is afforded to individual species

in a complex if the ABCs in a complex are just summed and that is the limit for the overall ABC for all components in the complex, and so I'm unsure how it works, and I am just seeking an explanation relative to the time we're spending thinking about ABCs for individual stocks, but, in a complex, that may not be the overriding consideration, and so is it possible to get some clarification on that?

DR. SEDBERRY: I believe what you summarized there is how the ABCs for the individual species are applied to the complex as an ACL for the entire complex. How that goes back to benefit or help manage each individual species, I don't -- That's to your question, I guess.

DR. SERCHUK: Well, the whole idea of an ABC, as I understand it, is to ensure that catches for that particular species or stock, as an upper limit for the conservation of a stock, in layman's terms, but, if a species -- If they are just simply added up, and one species contains a very large component of that ABC, and let's say it takes -- Let's say there are two stocks, and one stock has a productivity that says we're going to only allow 1,000 pounds, and another stock in the complex can take 50,000 pounds, and you add them up together, and one is 10,000 and one is 50,000, and that's 60,000 pounds, and so, if you're only managing on the complex, if that's the way the operational evaluation goes, theoretically, and perhaps pragmatically, you could overfish the smallest component, because they only make up a small component of that large thing, and I'm just wondering -- That may be the way it is right now, but I'm just wondering -- How does that really get back to the idea of an ABC as a measure, as a conservation measure, for removals?

DR. SEDBERRY: I understand, and that's a great question.

DR. ERRIGO: Although I wasn't here when the complexes were put together, I can tell you about the species that are in the complexes now, and most of these species are not like target species, nor can they easily be targeted, for the most part, and so, even if you have -- Like let's say the grunts. You have white grunt, which landings are well above all the other grunts in the complex, and then all the other grunts that are in there, which means -- Let's say, instead of filling up the landings with white grunt, you caught something else, and it wildly exceeded its ABC.

The thing is that, in practice, that doesn't happen, because we don't encounter that -- People don't encounter that species nearly often enough to be able to do that, and so that's why I think these complexes were designed, put together, the way they are, and I'm not sure, but, in practice, it doesn't seem to happen. Now, if it does happen, the SSC can come in and recommend changes, like this species should definitely be pulled out, because it's causing issues in this complex, or something like that.

DR. SERCHUK: So, pragmatically, if that's the case, I think we should spend most of our time on the major component of a complex and not worry too much about the ABCs for the other ones if exactly what you're saying is correct, and, if for a minor component, the ABC is far above the catch that we've ever seen, in that case, I won't make a big thing out of it, because it may only be 2 percent or 5 percent of the overall ABC for the complex, and you're assuring me that it's not -- Realistically, it's not going to happen, and so I'm just thinking about trying to be most efficient in how we consider these things.

If they were considered on a case-by-case basis, and were managed on a case-by-case basis, then I think we would need the same sort of rigor, in terms of how our ABC would be translated into

management practice, but, from what you said, it's really the complex that is the most important thing here, and the driver in the complex overshadows everything else, and so we shouldn't be as concerned, in terms of the rigor, and am I misstating anything or overstating anything?

DR. ERRIGO: No, not really, and, so far, that's kind of how you've been doing it. In the grunts, white grunt took up most of the conversation, and so that is how it's going, because those other species, which all together make up less than 5 percent of all the landings in the complex, tend to mostly be recreational, mostly be rarely encountered, and are prone to very high variability in their landings, and so there is really no trends, and usually you just see spikiness, and so --

DR. SERCHUK: One other question, if I may, Chairman. From a legal point of view, from Shep's point of view, is he satisfied that we're meeting the mandates of the Magnuson act by managing fish in this way? That is saying that some stock in a complex takes up 75 percent of the catch, say as a very high ABC, and, therefore, the protection that normally you would give equal protection under the law to each of the stocks doesn't actually apply in a complex-type setting. I know it's a legal question, but it's also a question of how the council looks at each one of the components that it manages. Thank you.

MR. GRIMES: I guess, in responding to that, we have what we have on the books that has been developed by the council and approved and implemented, and so, yes, my answer would necessarily be that it's consistent with the law, but I think we monitor it closely, and there is the possibility, in the case of complexes like this, where you could have the proportions of species change within the complex where the harvest, proportional harvest, of these things would change, and you could have a problem in the future, and we'll monitor that and stay on top of it, or presumably we will, but I think just the more basic question, in terms of what the law provides, is it's important to remember that the Magnuson Act itself is worded in terms of the fishery and that you have an ABC or you have catch limits for the fishery, and that gives us flexibility, and, theoretically, you could even have a snapper grouper fishery, and your catch limits for the complex was the snapper grouper fishery. It hasn't worked out that way, for obvious reasons, just because there are so many species, but that is how the statute is worded.

DR. SEDBERRY: Thanks, Shep.

DR. SHAROV: I guess we touched it several times, but I just wanted to hear a clear statement. We have a group of similar species, and usually one or two are dominant and others, a very small percentage, are smaller, and we use the catch information -- Nonetheless, we distinguish them in statistics, and we calculate the total catch annually by those species, and then the time series are being used to calculate the average catch for each of them, for the reference period, and then they are being totaled, and that total becomes a reference for the group, and the ABCs calculated for the group, and that is the metric that is the control measure that is the one that results in action if the ABC is exceeded, and so, based on all of this that is being said, in the current setting, we don't care whether one or two or five species are falling below their own reference period average. All that we care about is the one group ABC value, correct? Okay. Thanks.

DR. SEDBERRY: Well, we care, but what's --

DR. SHAROV: I understand. With respect to the management plan and the --

DR. ERRIGO: Let's take margate, for example. This is a very tiny portion of the grunts, and let's say you get like a spike like this in the time series, and it's way above its ABC, and this is all recreational, and it's very rarely encountered. Can you say, if you were just tracking margate, that this is detrimental and that is overfishing and things like that? Most of these species in these complexes are like that, and so, if you put them together, you have less of these kinds of issues.

MR. CARMICHAEL: I would say the council cares about the overfishing, and that's the requirement under the law, and, as Shep said, this is part of an FMP, and it was considered to meet the requirements. The complexes are to make the tracking of the ACLs a bit more efficient, and there is no species that are assessed that are in complexes, and so these are all fish that are not assessed, and we don't know the fishing mortality levels, and we don't know the overfishing levels.

Remember that we just have an ABC, and so we don't know that landings over one of these ABCs results in overfishing, because we don't know the OFLs, and so we can't really answer that question, but I would say, comprehensively, the SSC looking at species within a complex on a regular basis and saying is there anything that you see that raises your concerns, that maybe this species is not being adequately protected from overfishing, by virtue of its being in that complex, and then that would be something the council would need to respond to and try to come up with a better way of handling it, and I think that gets back to the earlier discussions about are there other metrics better than landings that we could use and do a more comprehensive approach about this overall, and I think there's a lot of big-picture issues like that to look at.

I think, if we had the time, we would probably do stuff like this more often, and maybe we can do it with sub-groups, but we've spent three times as long here as the full committee as we did on the sub-group going through this, and so I'm a little -- I'm wondering about doing sub-groups in the future, but I think going through this is part of the exercise, and just make sure you know why the complexes are just there for ACL monitoring purposes.

DR. SEDBERRY: Thanks, John.

MR. GRIMES: I was going to say some of the same stuff you said, and the SSC -- It isn't that the council doesn't care about this, but, for catch limit and quota monitoring purposes, there is one ACL, and we monitor the one ACL. When we set ACLs each time for the complexes, we'll come in and have, I presume, a similar exercise to what we're doing now, because we would need an ABC recommendation from the SSC, and I would encourage you to voice your views if you thought something was inappropriate about the complexes or that it looked like harvest patterns were shifting such that it was problematic for one or more species in the complex, and that's definitely something you should have input upon. Thank you.

DR. ERRIGO: With that, I think we should jump into our first -- There is two species that we have left, and hopefully we can get through them relatively quickly, because there are other agenda items and other people who need to present. The first one is almaco jack, and what I did was I went into the SERFS trends report and pulled out the nominal CPUE data from the tables and plotted it here in the green, the bright green, and so this is what --It talks here about the SERFS trending up, but the proportion positives are very, very low, and, as you can see, they don't catch them every year.

DR. SEDBERRY: There was CPUE in the table, or it was just total number of fish?

DR. ERRIGO: There was total number of fish and then the number of collections that were used in that, and so I just divided number of fish by number of collections. The workgroup did recommend that this be looked at to maybe remove from this complex, because of the changing landings trends at the end, that they're really going up.

DR. SEDBERRY: It seems, from what we hear, that it's being targeted more. Is it the desire of the SSC to recommend to the council that almaco jack be removed from the jacks complex and be considered on its own? Any objection to that? Okay. Then we have a fishery-independent relative abundance index there that indicates increasing abundance that kind of goes along with the increasing landings, so that the increasing landings may be reflective of increased abundance and not increased effort. Is everybody happy with the revised ABC?

DR. SERCHUK: I have no problems with it, but the question then becomes -- If we pull it out, which I understand that its current landings are still going to be above the ABC, even though we have a feeling that the increased landings are a result of increased abundance, and so what's the next step?

The next step could be, well, we really need to take a closer look at any information we have on this stock, because, quite frankly, we believe the increase is due to targeting, but it's also an increase in population size, and maybe the increase in population size has prompted the increase in targeting, because they are more available, but, in any case, it's still above the ABC, and so, if we pull it out as a separate ABC, how are we going to get out of this conundrum, and that's a question that I think we should ponder before we pull it out, because one thing would say that we pull it out, and the first thing we've got to do is stop the catches. They are too high. Thank you, Chair.

DR. ERRIGO: You do have several ways to approach this. One is like was done for blueline tilefish before it was assessed, and you can not follow the control rule and set an ABC based on where you think the stock is now, or where it might be going, if you feel the abundance is -- If you feel the stock can sustain the level of landings where it is now, and you can change the reference period, if you think that the current reference period no longer reflects the productivity of the stock now, you can change the reference period and then recalculate the ABC, and that's another possibility, and so there are several things you could do. We did use the decision tree for almaco jack, due to species identification issues with this species.

DR. SHAROV: A question. Is this primarily a commercial or primarily a recreational species? What is the proportion of landings commercial versus recreational?

MR. CARMICHAEL: It's about 50/50.

DR. SHAROV: I asked the question only because I was thinking that, if you are to take it out of the group and consider it separately, how good are our data? I mean, if it's totally recreational, then what the PSEs are. I mean, we're looking at the -- The total weight in pounds seems to be rather small compared to a number of species that we have looked at, and so that probably amounts to -- I don't know how many, but 100,000 individual fish, or maybe even less than that. Like Fred said, I also don't see the advantage of removing it from the complex, because we don't have means of improving the advice by doing so.

DR. SCHUELLER: I think there are several species that we have discussed removing or not removing from the complex, and I think that -- At this stage, the way I would see it is that we could recommend it for consideration, because I don't know what the process is for removing something from a complex to begin with, if that takes an amendment or what it takes, but it seems like we would want to look at the species holistically and make decisions in a uniform way, whether or not they should be removed or not from a complex. To me, this is just like a starter list of we should consider this based on things that we may be concerned about, and that's where I am sitting anyway. I mean, John is not in here, but how do we remove from a complex?

DR. ERRIGO: The council has to do an amendment that removes something from a complex or reorganizes the complex.

MS. BROUWER: Just following up on what Mike said, there are several criteria that the council has to evaluate, and there has to be -- The species needs to not be in need of federal management and conservation to be removed, and so it's a rather lengthy process.

DR. ERRIGO: But from the complex and not from the FMP.

MS. BROUWER: Well, okay. From the complex. It would still require an amendment, you're right, but it wouldn't have to abide by those criteria, and the council has been talking about this for some time, and they have actually requested a white paper on almaco that we're going to be putting together -- I forget when they want to see it, but sometime next year, and the AP has also suggested that almaco be removed from the jacks complex and that it have their own ACL, and this has been coming up in meetings a lot.

DR. SEDBERRY: Well, why don't we wait and reserve our comment until we see this white paper, and we can comment on it? I mean, right now, we can suggest, or we can concur, or we can recommend that the council consider removing this from the jacks complex. Shep, do you have a comment on this?

MR. GRIMES: Thank you, Mr. Chairman. I was just going to add that, in terms of potential benefits to the stock, if you decide, and if the council agrees and removes it from the complex, then it will have its own ABC and its own ACL, and that can be a more effective constraint on harvest than perhaps is currently occurring with it in the complex. Thank you.

DR. AHRENS: Doesn't that then basically mean that that complex is dominated by banded rudderfish, and it becomes a complex of one, since the lesser amberjack are fairly non-existent in that? Are we just killing the complex?

DR. ERRIGO: Perhaps, but, if you feel that almaco really warrants not being in the complex, then we'll have to work out how that plays out with the other two species that are left.

DR. BUCKEL: I think it was Chris Conklin that mentioned that ID wasn't an issue for almaco, and, if that's the case -- I can't remember the discussion, but this -- I think it was the whole jacks complex, and maybe lesser is -- I don't remember the -- Maybe it's the smaller ones, but, if we feel, as a group, that -- Now that we see some fishery-independent data with the landings, if we

have more confidence in the catch data, and we feel that those are reliable, then we could go to Level 4 and set ABC right now.

DR. ERRIGO: If you feel that way, I can calculate ORCS, although we don't have a risk of overexploitation category for almaco, because it was removed prior to the workshop that we had where we did all of those, and we could come up with one ad hoc, but that's something that would have to be done, and I think Chris was talking about commercially there is no species ID issues, and I don't know if there are recreationally, but I was just saying that, originally, that's why we didn't put it in ORCS.

DR. SEDBERRY: The historical data probably has species ID problems in it, but it's just that more people are aware of it now, and I think, going forward, there is no -- There is fewer species ID problems, but the historical data may contain mixed jacks.

DR. ERRIGO: If you look here, in the early time periods -- First of all, there are no landings, no commercial landings, and that's because everything was just landed as jacks or amberjacks all together, lesser, greater, almaco, and they were all landed together, and the same thing was happening in the recreational sector, because you can see that landings were very, very low, and then, all of a sudden, they get much higher, and that's not because the fishery ramped up. That's because they actually started identifying them to species. Most of it happens before the reference period though, that particular issue.

DR. AHRENS: I think, just from moving to ORCS, we may have -- I am not sure what the PSE is on the commercial time series for them, but we're above -- We're at 30 to 45 percent PSEs on the recreational, and so that begs, again, that question of is it a reliable catch time series.

DR. ERRIGO: We don't have estimates of uncertainty of the commercial catches, and they don't actually produce those, and I'm not exactly sure why. I'm not sure how that works, but there aren't any estimates of uncertainty for the commercial landings, but they are often thought to be significantly lower than the levels of uncertainty for the recreational sector.

DR. SEDBERRY: So where are we with the jacks?

DR. ERRIGO: We still need an ABC, and there are several options that the SSC has to getting one. You can set one based on the most recent years, or you can set one based on the reference period, and we can switch to ORCS using the reference period, or we can switch to ORCS using more recent years, and there are a bunch of different ways, although it should be -- You should realize that, since 2012, the complex has shut down early, recreationally and not commercially.

DR. SEDBERRY: You mentioned that, during the reference period, species identification -- The data kind of indicate that species identification was not a problem during the reference period.

DR. ERRIGO: I don't really know. I think it wasn't a problem commercially. I don't know what was going on in the recreational sector.

DR. CHEUVRONT: I can't really speak to the recreational sector well either, but, really, species identification really is not a problem at all. Banded rudderfish and lesser, those sometimes there is a species identification issue, but there are so few, really, of the lesser, and they are pretty far

off, and it's not that big of an issue, but, the other species in the complex, there is no issue with species identification. There just isn't, and so I am thinking that, if you're talking about MRIP landings, and I can't imagine that they're having a problem with species identification. The creel clerks should know the difference.

DR. SEDBERRY: The ORCS approach might work then for the reference period. We could try it.

DR. ERRIGO: ORCS should work, I guess, for any of the time series. If that's the way you guys want to go, it will take me a minute to calculate, and so I can calculate that and bring it to you in the morning, and I think that might be the best way to go about that, because I need to -- It just takes a little while to manipulate it in Excel, and I don't want to waste time. Is that how the committee feels, that we'll just use ORCS during the reference period to set the ABC for this stock?

DR. SCHUELLER: That's fine with me. My question would be then that we should be very specific about what we think the choices for that are, and so we have to have some scalar choice, based on the exploitation level we expect for this species?

DR. ERRIGO: Yes, and you would need to tell me what you think the risk of overexploitation is, what category it falls into. Is it a moderate, moderate high, moderate low, low, high? What is its risk to overexploitation? The council's risk tolerance is -- I can get that based on what the risk of overexploitation is.

DR. BUCKEL: I was going to ask George. Is it similar to greater amberjack?

DR. SEDBERRY: I would guess so, that its risk of overexploitation is similar to greater amberjack.

DR. ERRIGO: Greater amberjack was assessed, and so it doesn't have a risk of overexploitation. For example, gray snapper, lane snapper, and cubera snapper were all considered moderate risk of overexploitation, and white grunt was considered moderately high, and tomtate was considered moderately high, and margate was considered moderate. The red hind was considered moderate, and rock hind was considered moderate high, and there were very few that were moderate low or low. Silk snapper was moderate, and yellowedge grouper was moderate.

DR. SEDBERRY: Moderate seems reasonable, but I don't know what --

DR. ERRIGO: We chose moderate high for hogfish, but I don't think it has the same risk of overexploitation as hogfish.

DR. SEDBERRY: We had low for bar jack, but bar jack is kind of a lot different than almaco jack.

DR. ERRIGO: Yes, and so it seems like it would fall into the moderate or moderate low categories, and I can calculate it for both of them while everyone sleeps on it, if you want, and I can also try to find the criteria and maybe see if I can kind of calculate what it might have been overnight. I can do that.

DR. BUCKEL: In Attachment 4, we did set a productivity and susceptibility risk analysis for greater amberjack, and that was a two, medium risk, if I am reading that table correctly, and so that's moderate productivity, moderate vulnerability, and moderate susceptibility, and so that may argue for moderate.

DR. JOHNSON: I also delete nothing from my email, and I went back and found a classification sheet that may be an old draft, but it has this species as moderate, using all the classifications that we did, and it might be a starting point.

DR. SEDBERRY: It sounds like moderate.

DR. NESSLAGE: Given this is a species that is about 50/50 commercial to recreational, and the size of the commercial fishery, if I'm reading this right, and correct me if I'm wrong, is on par with like golden tilefish, for instance, and why aren't we getting enough samples from the commercial fishery to do a more structured assessment? I think, if I'm reading the numbers right, we should be highly encouraging this to move not only out of the complex, but put it on the SEDAR schedule and have a proper assessment, because this is a sizable fishery then compared to several of our other fisheries that we have age-structured assessments for.

DR. SEDBERRY: That is a good recommendation.

DR. BUCKEL: There is a sentence in there that says ask the Center to use data-limited approaches to assess, but it could be data-rich or data --

DR. ERRIGO: Yes, and, if we say to consider for SEDAR assessment, then that runs the gamut. So one down.

DR. SEDBERRY: How many to go before cookies? One more. Okay.

DR. ERRIGO: I didn't know what to do for black grouper, and I did pull in the third-highest, but it didn't pass its assessment, and it needs a new ABC that uses the new numbers, and, since it didn't pass its assessment, we need to use something to get an ABC. If I remember correctly, when we were going over that failed assessment, the Florida team said that they felt that black grouper was -- They had no concerns over black grouper, and they felt that status quo would probably be sufficient to maintain the stock.

DR. SEDBERRY: Does the SSC disagree with using third-highest?

DR. ERRIGO: I also steered away from ORCS, because the reason why it failed its assessment is because of the issue with the ID issue with gag in the landings, and so I figured it probably doesn't have a reliable catch stream.

DR. SEDBERRY: So the third-highest makes sense.

DR. SCHUELLER: I was just wondering what other information we have, and so, clearly, this went to assessment and what index information, et cetera, is there to inform this?

DR. SEDBERRY: Visual census or --

DR. ERRIGO: I can -- All that information should be on the SEDAR website, and I can pull that for you guys. I think it's also in one of your briefing books from several years -- I don't know how long ago we looked at it.

DR. AHRENS: I think, if I recall from the data workshop, there was concern that that identification contamination just runs through all of it, and so you may have catch rate, but you don't know if the IDs were correct, in every fish survey or any of those, and so all the data started to fall apart when you said, well, there could be ID issues.

DR. SCHUELLER: Even for the survey data, if there are survey data? I mean, I get if there's like issues with the catch, but I am just wondering if there is any fishery-independent data and whether or not they would have ID issues, because it does happen.

DR. AHRENS: We would have to go back and look on that one.

DR. ERRIGO: I don't remember if there was a reef survey or any of the video surveys from the Gulf that had any black grouper in it, and I can go and check. I just don't recall.

DR. SEDBERRY: It's not sampled by SERFS?

DR. ERRIGO: No.

DR. SEDBERRY: I think there's a visual census done in the Keys.

DR. ERRIGO: I can pull that, and we can check that tomorrow, to make sure that we're comfortable with the SSC's recommendation, if that's all right, and I don't want to spend too much time with busywork in the middle of the meeting, but I'm more than happy to do it overnight and then bring it back.

DR. SEDBERRY: That sounds good. Is that agreeable to everybody? I see nodding heads. All right. Let's take a fifteen-minute break, seventeen-minute break, and come back at quarter til.

(Whereupon, a recess was taken.)

DR. SEDBERRY: Because of the travel and schedules of some of our presenters, we're again having to modify the agenda a little bit, and the next thing up on the agenda is Agenda Item Number 7, the Coral Habitat Distribution Model, and this is Attachment 10 in the briefing book, and I have Wilson, Amy, and Alexei taking notes on this section, and we're going to have a presentation, which Chip Collier of the council staff is going to introduce.

CORAL HABITAT DISTRIBUTION MODEL REVIEW

DR. COLLIER: Thank you. I wanted to give a brief introduction on why we're talking about coral occupancy models today. In the past, the council has been pretty proactive in establishing coral habitat areas of particular concern, or CHAPCs. These were primarily designated based on

either observations or known distributions of some deepwater species of coral. Since then, we've had a lot more research, and actually a lot more data collected, and so now we can develop models to consider in development of these CHAPCs, or coral habitat areas of particular concern.

Prior to the council being able to use these models and establishing new ones, we wanted to make sure that the SSC was good with the methods. Primarily, you guys are going to be looking at the methods today, since it's looking at a lot of Gulf of Mexico information, but we want to make sure you're good with the methods, and this potentially could be considered in developing some of these areas in the South Atlantic region.

With that, I wanted to introduce Holly Goyert, and she's a quantitative ecologist with NOAA, and she's working with the Biogeographical Branch of the Marine Spatial Ecology Division of NCOS, and she worked at her PhD at the City University of New York, where she worked on interactions between community seabirds, marine mammals, and fishes, and she worked on a post-doc at North Carolina State, where she estimated the exposure of these communities to energy development offshore of the Mid-Atlantic region, and she used a Bayesian approach for that.

She has also completed post-docs with the USGS Cooperative Research Unit at the University of Idaho and also at UMass Amherst. There, she analyzed the population dynamics of Alaskan seabirds and the movement ecology of endangered marine birds using nanotag tracking technology and the MODIS Wildlife Network. Here, she's going to be presenting community occupancy models that she developed with Arliss Winship and Matt Poti to analyze the distribution of richness of deep-sea corals. This work is primarily funded through BOEM, but we're very happy that they're doing it, and it's going to be, I think, very informative for the South Atlantic Council, and, with that, Dr. Goyert.

DR. GOYERT: Thank you very much for the invitation to present. Today, I'm just going to discuss, as Chip mentioned, some models that are in development by our group at NOAA to estimate the distribution and richness of deep-sea corals in both the Southeast U.S. and the Gulf of Mexico, and I will provide a little background on the projects in which we've been involved for the past decade and so and introduce our new methods and show some very preliminary results, and provide time at the end for discussion and questions.

Throughout the talk, you may refer to the top of the slide for reference point and the bottom right for the slide number, which apparently right now we can't see here, and it's blocked, but, for those that are online, and, for some background on our group's work in the past, Chapter 8 of the *State of the Deep-Sea Coral NOAA Technical Report* describes how our team has used MaxEnt with presence-only data and a machine-learning approach to model the distributions of deep-sea corals in the U.S. Atlantic and Pacific. For example, on the right is the predicted distribution of framework-forming corals off the southeast coast of the U.S. and associated habitat areas of particular concern, and you can see how these types of results may be useful to evaluate the placement of marine protected areas.

In 2015, the Mid-Atlantic Fishery Management Council used models developed by our team to inform the establishment of the Frank R. Lautenberg Deep-Sea Coral Protection Area, which is about the size of Virginia, and this, of course, received some good press, but, since then, several new ROV surveys have collected even better multibeam seafloor mapping data, particularly in the

Southeast and Gulf of Mexico, and so the Bureau of Ocean Energy Management was interested in having us update our models to include the new surveys.

Our current project covers the Southeast and Gulf of Mexico, where we work with Peter Etnoyer's Deep Coral Ecology Lab, which is here in Charleston, and they did the extremely valuable and important task of going through the past three decades of data and extracting or rescuing the absence data from dives, and so these absence data have opened up a whole new world of possibilities, in terms of robust analyses of deep-sea corals.

On the modeling side, our objective was to develop and produce predictive spatial models to improve region-wide maps of the distribution of deepwater coral in chemosynthetic communities, and so I have highlighted the three key words here with which our approach aligns closely, and that is focusing on methods that would maximize the predictive power of the distribution of deep-sea coral communities.

To describe our modeling process, I am going to use the Gulf of Mexico data as an example, which is farther along than the Southeast, and we fit the presence-absence data from deep-sea coral surveys to a suite of environmental predictors, some of which are derived from multibeam bathymetry data to quantify depth and the complexity of the seafloor, and others are remotely sensed, like surface chlorophyll, and a few are based on ocean models, such as ocean currents. By fitting these coral observations with our predictors, we get functional relationships that we can then use to predict the probability of occurrence across the entire region, including unsampled areas. Again, I apologize to you guys, but, today, I'm going to be presenting only on the Gulf of Mexico as an example, and we'll be developing Southeast models in the next couple of months.

Our predictor data are at a spatial resolution of about a 100 to 370 meters, and our collaborators go to the presence and absence data from eighteen surveys over the past three decades. Since we're interested in predictive power for our purposes, each habitat predictor cell is the smallest unit of interest, and, again, that's about 100 to 370 meters. Therefore, we treated each predictor cell as a site, and we found that the past three decades of surveys left us sometimes in the hundreds of samples per site, as you can see by the size of the Xs on the bottom-right of the screen, where each sample is a dive segment or an image from a submersible.

This offered the unique opportunity for us to treat the number of samples per site as spatial replicates, and so remember that corals are very long-lived, and they can survive thousands of years and take a long time to grow, and so, even though our surveys span thirty years, this is a very short timeframe relative to the lifespan of these organisms, and you are probably more familiar with the use of temporal replicates, where the same site is visited over time, but the nature of our data serve as an excellent candidate for the analogous space for time substitution, where we can use this within-site variation to our advantage.

The spatially-replicated samples allow us to estimate detection probability, and, in the context of a space for time substitution, this additionally includes availability probability, and so this accounts for the fact that, although corals may be available at a site, they may just be missed, or they may go undetected by the observer, due to a variety of reasons, which I will discuss next.

Ultimately, we are interested in predicting habitat suitability, meaning we model between-site variation, but, by estimating detection probability, we can now model occupancy probability, and

that has many benefits. Most importantly, it allows us to estimate true occupancy, as opposed to relative occurrence, and estimating true occupancy means that we can implement a hierarchical community or multispecies approach, but, before we get ahead of ourselves, let me explain a little bit more about how detection probability works.

If we take a sub-sample of our predictive grid, for example in the Gulf of Mexico, Flower Garden Banks let's just say, and focus on two grid cells, and we can see, in this example, both grid cells are occupied by corals, and so that means that their true occupancy state, or Z, is equal to one, and, if we initiate a dive through these grid cells, we take snapshots, or images, along the submersible's path. Here, we miss the coral, just because it was blocked, or obscured, by a rock. As we proceed, we miss the coral just because it was located outside of our frame of reference, and so, in our data, we see that the observed occurrence, or Y, is equal to zero, and it's the same for both of these grid cells, because no corals were detected, but these are actually two different processes that are occurring.

The first grid cell on the left illustrates what we call true detectability, and the one on the right illustrates what we call availability, and so, although the second grid cell was occupied, those corals went undetected simply because they were not available at the locations where we sampled, and this happens because we were using spatial replicates instead of temporal replicates in the space for time substitution.

Traditionally, with a temporal replicate, one would observe the entire site, or grid cell, for each visit, but, essentially, each of our images, or spatial replicates, are sub-units of the site, and that means that there are technically three processes that are occurring, or three levels of analysis. We have occupancy, detection probability, and availability probability, but, by combining availability with detection, we are collapsing those three levels to two, and so just occupancy and detection, and Mark Kery and Andy Royle ran a simulation of this, showing that a two-level model performs just as well as a three-level model to analyze a space for time substitution, meaning that we can treat availability and detection probability as a single process.

From here on out, when I mention detection probability, I am referring to availability as well, but, either way, the most important benefit of occupancy modeling is that it helps us to account for detection probability and deal with this question of how confident are we that observed absences are true absences and how do we know that there aren't actually corals behind those that are visible in this photo.

I think that, if you asked this to any deep-sea coral ecologist, you would probably put them at ease by assuring them that we don't have to assume that every sampled absence is a true absence, and that's because we can now estimate true occupancy. Essentially, if we take the probability of observed occurrence, like a fraction between zero and one, and divide by estimated detection probability, another fraction between zero and one, we sort of scale up the occurrence closer to one, where it should be, to essentially get true occupancy, and that's whether the coral was actually present, despite being undetected, and so occupancy analysis allows for this flexibility, given its assumptions.

First, sampled absences are not treated as true absences, and so false negatives are explicitly dealt with through the estimation of detection probability, but, on the other hand, there can't be any false positives, which we handled by identifying species only to the lowest taxonomic level at which we

could be confident, and that was usually genus, and sometimes family. Second, there is the closure assumption, where the sampling time window needs to be short relative to the system dynamics, but deep-sea corals are a perfect study organism for occupancy models, because they are sessile and long-lived, meaning that we can use static occupancy and meet this assumption.

Third, the model assumes independence of occurrence and detection probability across replicated visits, and, again, here, given that corals are sessile, they should show no behavioral response to the observer that can influence detection probability between visits, and, fourth, we assume homogeneity of detection probability, but, fortunately, we can eliminate heterogeneity using an observation level covariate on detectability, the effort offset, which, in this case, is the area sampled per observation, or, in other words, like the size of each image.

Overall, this is a conservative approach to handling potential sampling bias, and so, according to Kery and Royle, if we do not have a balanced design with the same number of replicates at each site, it's best if the number of surveys per site is randomly allocated to that site. If it depends instead on some site characteristics, biased estimates may result. For instance, if multiple surveys are only undertaken at the better sites, where density, and therefore detection probability, may be higher, on average, the resulting estimate of P, detection probability, will be biased high with respect to all sites, and, therefore, the occupancy estimator will be biased low, and so non-random sampling can cause issues in any model, but it's worth noting that, in this particular scenario, while it may lead occupancy to be biased low, in a conventional model, occurrence will be biased high.

Why occupancy analysis? For one, because it offers this conservative approach that I just mentioned, and that's due to this explicit false negative analysis, and it also gives us the ability to estimate the true distribution of corals, and that is standardized across species within the community, and what that actually means is that, if the probability of occupancy for one species is 0.2 and for another it's 0.4, we can reasonably say that that second species truly occurs twice as often as the first.

This, in itself, gives us the ability to estimate community species richness, and that means that we can combine multiple species or genera into a single map, and so this is an improvement on presence-only models, which predict relative occurrence, in other words a slope without an intercept that is standardized between species. We based our community occupancy approach primarily on Chapters 10 and 11 of this reference, to which you may refer for more details, and the community hierarchical approach limited us to using a Bayesian framework, where we ran all of our models in JAGS using R.

Next, I will discuss model structure. We have two components of the model, the observation process on detection and the state process on occurrence, and so we supply our presence-absence, or occurrence data, to the model as Y. That is where I is equal to the site, and J is the occasion, or the spatial replicate, and K is the species. Z here is the latent or unobserved state, and so, as I mentioned before, it's the estimate of true site occupancy. We treat Z and Y as a Bernoulli random variable with an outcome of zero and one, or, in other words, a binomial with a single trial. Psi is the occupancy probability, and P is the detection probability, and you can imagine how, if we take sites that are truly occupied, where Z is equal to one, and multiply them by P, which is less than one, then we get only a subset of the detected presences at that site, which is our data, Y.

We use a c-log-log link, as opposed to a logit link, because it's more compatible with our effort offset, and $alpha_0$ here is the species-specific detection intercept. $Beta_0$ is the species-specific random intercept on occupancy, and it is drawn from a mean community hyperdistribution, and so, similar to a random effect, parameters for each species are drawn from an overall community mean, so that information is both shared among species and also informed by species, and so this is the key here to community models. This enables us to include rare species that would otherwise be discarded due to lack of observation and to see whether certain species respond to habitat in a different way from the rest of the community, and so, in other words, we can directly compare habitat use in distinct coral groups to the overall tendency of the entire community.

Similarly, the species-specific coefficient on each covariate is drawn from a mean community hyperparameter, and so, here, $beta_1$ would be the coefficient on bathymetry, and it, again, is drawn from a mean hyperdistribution. Similarly, if we had more covariates, then it would continue with $beta_2$ and so on.

I will share with you some preliminary results from an example community of branching stony corals, and these are framework-forming Scleractinia, a group that consists of five genera of special interest to the Bureau of Ocean Energy Management. Only lophelia pertusa was identified to species, and it was one of only four taxa identified to species in the entire Gulf of Mexico, and so, instead of using a species-level community model, we ran it using genus as the lowest level of identification, and, as far as we know, these genera are relatively homogeneous and comprised of only one to two species each in this region. Also, to be clear, while some of these genera may have overlapping niches, they do not need to co-occur to be included in a community model. They can partition habitats.

Here, the genera are shown in decreasing order by number of observations, which is given on the right as the number of sites at which they were observed and the total number of detections, and the X-axis is on the probability scale, from zero to one, and the shows the posterior mean and credible interval for genus-specific detection probability in green, P, and the posterior mean for the occupancy probability, or Psi, which is in black, and the posterior mean for the community occupancy hyperparameter, which, if you remember, was that $Ubeta_0$, that is the vertical blue line with the credible interval as the dashed lines, and they are wide.

They range almost all the way from zero to one, because it's the entire community, and so you can see that the species fall within that community and that the more frequently observed genera towards the top were estimated to have both a higher detectability, in green, and the occupancy probability, in black.

For our preliminary analyses, we wanted to test the performance of the occupancy model with several linear and/or non-linear predictors, and so we ran it using polynomial terms. Here, the Y-axis on the left is one of our seven predictors, bathymetry, with the X-axis being effect size for that predictor, showing whether the effects were more positive towards the right or negative to the left, and this is for the genus lophelia. We used a quadratic formulation, which is why the predictor is shown twice, with its square term above, and this allow for a non-linear relationship, as you can see here by the curve on the right, where the bathymetry is now shown on the X-axis, and the probability of occurrence is on the Y-axis, which, again, ranges on a scale from zero to one, and so, here, lophelia were most likely to occur along a shallower gradient of our study area.

Now I will show the genus-level effects of all seven predictors for lophelia, and, again, I don't want to focus too much on the predictors, because we're still undergoing predictor development, but, just to give you a sense of what we used in this particular example, we had depth and bottom oxygen, dissolved oxygen, bottom temperature, surface chlorophyll, sediment grain size, the slope of the seafloor, and the slope of slope, or the curvature of the seafloor.

Just note that, here, the effect sizes are wide, and that's just because they range on an orthogonalized scale, and we used an orthogonal transform to center and scale each predictor, which removes collinearity between polynomial terms, and those genus-specific effects that were significantly different from zero, so that do not cross zero, are shown in red, and, if we look at the covariate effects of the other genera, and we focus on the slope of the seafloor, and so second from the top, you can see the effect is negative for the more common genera, and it's positive for the less common genus on the right, and so what you see here is that the community model maintains heterogeneity in genus-specific covariate effects, despite being drawn from a common mean hyperparameter. This is important, because it means that we can include genera that partition habits and do not co-occur.

Here we have the outputs of our community model, and this map here is the resulting predicted posterior mean probability of occupancy for each genus from this community occupancy model of Scleractinia, and the maps on the left come from the community model, but, for comparison, we ran a couple of single-species occupancy models on Lophelia pertusa and Solenosmilia variabilis, and the output looked almost identical to what is shown here, but the benefit of instead using the community model is that now we can include the bottom genus, which is uncommon, without having to work as much about overparameterization and model convergence.

Additionally, because these five genera are modeled together, their probability maps can now be stacked to produce a single map of genus richness, and so, in other words, here, we sum the posterior mean probability of occupancy across genera, based on a sub-sample of fifty from the posterior, and, to be clear, we are presenting now two metrics resulting directly from our models, and so the genus-specific probability of occurrence on the left and the genus richness, which is on the right.

Genus richness is a very useful and somewhat newly-implemented metric, from a management perspective, to inform energy development and fisheries interactions with deep-sea corals. Here is a map of the coefficient of variation of the posterior for genus richness, and so this is the standard deviation divided by the posterior mean genus richness, and this is based on a sub-sample of fifty from the posterior. The red here shows greater uncertainty, and the dots show where surveys sampled, and so black is presence of corals, and blue is where corals were absent, and it indicates that there is greater uncertainty in areas that are data poor, due to lack of survey effort, as we would expect, particularly in areas at the extreme ends of the predictor values, and so, for example, deep water.

Additionally, we used a Bayesian approach, which allowed us to better characterize uncertainty than the machine learning approaches that our group has previously used, and that's because it allows us to work with posterior distributions of the parameters, and so what are the management applications of community models?

They allow us to take a multispecies approach to ecosystem-based fisheries management, and so going beyond single-species models with the use of hierarchical functional groups, and this approach is also being used in marine spatial planning to inform energy development offshore. For example, a few years ago, I helped develop a hierarchical community distance sampling model to estimate the exposure of forty seabird species to three wind energy lease areas off the Delmarva Peninsula, and I even used the seafloor habitat data that Matt Poti and Brian Kinlan and others derived for deep-sea corals in this region as some of the predictors to inform the distribution and abundance of marine birds, and so the output maps from this project, which are similar to the ones that you see here, are now available to developers to include in their construction and operation plans.

Next steps are to further our model diagnostics, and this includes examination of the residuals from the models, calculating things like Bayesian P values, and then also conducting model selection or model averaging, and this will coincide with further predictor development. There are several folks to thank that have been involved in this project for many years, and I have some time for questions. Thanks again for your time.

DR. SEDBERRY: Thank you, Holly. Do we have any questions from the committee?

DR. LI: I have two clarifying questions. The first one, the equation, when you show the normal distribution, and maybe I have missed the -- $Beta_0$, that's the intercept, and then the $beta_1$ is the coefficient of the covariate, right? The $beta_0$, the last one on the bottom, the equation, the c-log-log, the $beta_0$ is the intercept?

DR. GOYERT: Yes.

DR. LI: Then the $beta_1$ is the coefficient for the predictor variable?

DR. GOYERT: Yes.

DR. LI: Then each intercept and each coefficient follows a normal distribution?

DR. GOYERT: Yes. The intercepts, yes.

DR. LI: Okay.

DR. GOYERT: The intercept is technically the c-log-log of the detection probability and the occupancy probability, which falls between zero and one, and so, actually, for those, it's a uniform distribution and then the c-log-log, but, yes, for the coefficients, it's a normal distribution.

DR. LI: Yes, that makes sense. Then, when we look at the outcomes, when you show the red bar and the black bar for the coral-species-specific predictor variables, you have -- Those are significant and important predicator variables, and those black ones, because it covers zeroes, is not significant, and so, when you produce the map, you use all the predicators there, or you only use the red ones, the significant ones?

DR. GOYERT: Good question. In this particular case, what we did in this development, because, again, these are still in development, was we used the full model, and so the global model, and so

that does include the variables that are not significant, and so it would include the black ones here, but, again, we're also now working on model averaging, and so that would start with a global model, but it would presumably weight the significant variables more highly against those non-significant ones.

DR. LI: Okay, and so then my question is, is there any criteria when you select which variables you use in the model and which ones you don't use?

DR. GOYERT: We haven't really established that yet, again because we haven't developed our final set, but we will be looking into that in more detail, and so one of them is going to be looking into collinearity among them, and we've been looking -- We have examined that as well so far, and so, yes, that will play a role, but we haven't gotten that far yet to remove any particular covariates.

DR. LI: Here, like the list of seven predicator variables, they are all like abiotic predictors, and are there any biotic predictors that are available and you may think are important to predict the coral distribution?

DR. GOYERT: We would love to be able to use biotic covariates. I think we are somewhat limited, because these are obviously deep-sea corals at thousands of meters, and my colleague, Matt Poti, would you like to help answer that?

DR. POTI: In the past, we have used things similar to what Holly has shown here, and surface chlorophyll is a proxy for productivity at the ocean surface, because many of these corals feed on marine snow, just debris falling from the surface, and so we try to include predictors from oceanography that would capture that biological productivity, but, still, it's not the same as including actual biological information, but it's the best we can do at this particular regional scale.

DR. LI: Thank you. I mean, this work is great, and I like it. I love it, and thank you for all the information, and it's very informative, the whole presentation. My last comment and question is, looking at the equation, there is no time component there, right? There is no T or Y, and so you have species, and so I am thinking -- Because the data you collected are thirty years of data, which means some observations are from back in time, and some are recent, and I am curious -- The relationship that you developed based on the observations back through time, would that give us the same functional relationship information if you compared to the relationship developed using the most current information, because, as you mentioned, the coral can live for thousands of years, and, within like three decades, is there any like climate or environmental or regime shift or something? I am thinking there is no time component in the equation that can -- Is it a concern or if we capture the true -- Maybe it's a time-varying relationship there, how it is covered.

DR. GOYERT: I think that's a really good question, and I would say that, again, we're operating these models under the assumptions that I stated, and so we are assuming that the model is -- That the study area is closed, and I would say, because we are modeling habitat suitability, to some extent, we are looking at the suitability given the species that were observed during that time period, and so I don't -- Unfortunately, as much as I would like to include a time component to the model, at this point, we haven't figured out if it really would improve, given the nature of the data, but it's certainly something we're thinking about. Arliss, you're welcome to add to that, if you have anything to say, or Matt.

DR. POTI: I think there are a few sort of things that limit us in the ability to use only the most current data, and that's just that there is a limited amount of deep-sea observation data, and so, because they are sessile and long-lived, we wanted to compile as much data as possible, and that essentially covered the timespan of deep-sea observations, but we have been -- Some of our work is starting to think about environmental conditions that are changing, such as from climate change, and so, in our future work, I think we are going to try to incorporate that temporal component, but we have yet to tackle that.

DR. SCHARF: I had a question on the uncertainty maps, and I just wondered how the model could achieve such low uncertainty in areas where you have no data, and so some of the large sort of yellow and tan swaths, where there is no survey data, but yet you have really low uncertainty in those places.

DR. GOYERT: That has to do with the fact that the surveys actually covered a relatively large range of those predictor values, and that's why we would advocate for robust survey designs, to be able to cover those wide ranges, and, again, there were a lot of forces and people involved in these, and so you can imagine these surveys had different objectives, and so they covered a wide range, in general, of habitat.

DR. NESSLAGE: I have a question about your homogeneity of detection probability assumption, and so you mentioned that you use a covariate to help, I assume, to help eliminate the effects of heterogeneity, and then you said something about the effort offset, and I was wondering if you could elaborate on that a little bit, and are you really eliminating the heterogeneity, or are you accounting for that uncertainty in your estimates, and, if so, I was kind of piggybacking on Fred's comment that your CVs seem really low, given that there's probably a lot of site-to-site differences, and so is it truly accounting for that uncertainty?

DR. GOYERT: I think it's doing a pretty good job, and I was actually surprised at how good the CV maps look as well, and, to describe a little bit more about the effort offset, I didn't put it in here, but if I showed you a plot of detection probability on the Y-axis and effort offset on the X-axis, you would basically have an increasing curve, and so, the more area that you survey, the more likely you are to observe a species, and also the more likely you are to find more species, and so, yes, I think that that effort offset does a pretty good job, surprisingly, of eliminating a lot of that variability.

If we had other observation-level covariates, we could include them. To date, I haven't come up with any that I think would make sense, and I don't know if we have really needed to, but it's certainly something to think about as we move forward, if we do end up with questions as to maybe why some of these species have higher levels of uncertainty, and that's something that I could look into.

DR. AHRENS: Thank you for the presentation, and it was really neat modeling. I have one comment. Was there any utility, for the layers in dbSEABED for helping with the analysis? Did you look into that? I know that it has some vegetation -- I know it's pretty coarse polygon information.

DR. POTI: We actually worked with Chris Jenkins at the University of Colorado, who is the manager of dbSEABED, and he developed some interpolated layers for us that we used in some earlier modeling work, and we've used those again, but there is new sediment data, and that has yet to be adjusted into those interpolated layers. However, we didn't necessarily find that the sediment predictors were as useful as things like depth and seafloor complexity here.

DR. AHRENS: Thank you, and the second -- Could you go to the hyperparameter, that plot, with the mean -- Could you explain why the distribution mean is so far off what you're getting for the individual genus?

DR. GOYERT: This is because we're using vague or uninformative priors here, and so if you -- I could actually show you the community -- If I showed you this, and I could actually show you this for the community level, that hyperparameter, rather than for the species, and these would all be wide, and so, again, that's because these species are drawn from this overall community mean hyperdistribution. If we made those more informative, they would be smaller, narrower, and so, for now, that's why it doesn't contribute too much to our analysis, or to the results, the interpretation of our results, but what it does allow for is, because these species are drawn from that community -- Again, it provides more power, and so that's how we can now include that bottom species that is less common, and does that help answer the question?

DR. AHRENS: Kind of, but I guess I'm surprised that there is nothing on the right-hand side of the line, in terms of -- It looks like there is no posterior update to the prior that's used on the hyperparameter.

DR. GOYERT: Well, are you saying that you're surprised that none of the species are contributing so much -- That they're further to the left and you would expect to see some of the species a little further to the right to contribute to that much dispersion?

DR. AHRENS: Yes.

DR. GOYERT: I think what we're seeing there, to be honest, is a little bit of what we talked about, in terms of the survey design, and so I think what we're seeing here is a little bit more of that bias, in terms of occupancy detection and that they're a little bit low here relative to what you might expect, and that's because of the nature of the survey design, and, in other words, because a lot of the surveys didn't necessarily -- Some might have been more randomized than others, depending on their structure, and that occupancy estimator is going to be biased low.

DR. AHRENS: If I was to use the community-level distribution and say what is my expectation of occupancy from a randomly-drawn genus, I would say 50 percent, based on that distribution, and yet none of the genus seems to come even close to that.

DR. GOYERT: None of these genera, yes.

DR. AHRENS: So are there genera that are missing?

DR. GOYERT: Well, there was another genus that we ended up removing from this particular community, and that's because it wasn't framework forming, and it was a cup coral, and, I mean, the results weren't too different, but I think, to be honest, a lot of these species -- Again, we're at

the genus level, and we're not at the species level, and so there are going to be some unobserved species that are probably contributing to that community, but, again, what that has to do with is the relationship between the covariates and the species at which they were observed, or the occurrences at which they were observed. I think this has a lot to do with the range at which each of those covariates occurred, and I think that it's a wide range, and so that's also -- That is, to some extent, why this is a bit wider than you might expect.

I will also say, and I don't know if this helps at all, that I haven't -- The model aspect is still in development, but, in Bayesian framework, it's a little counterintuitive, as much as you might use vague priors when you're running a full model, a global model. When you're model averaging, because of the nature of the likelihood, and it's multiplicative, you end up with -- You need to use somewhat informative models, and so that should reduce some of that variability.

DR. LI: Just one follow-up, and, I mean, informative or non-informative priors should not affect a posterior distribution, because it's just prior. If the data is enough information to inform the parameter and it is converged well, your posterior distribution is not supposed to be constrained by priors, and so I don't think that's a type of prior choice.

My question is -- Can you go back to the equation, the model structure slide? At the bottom, each coefficient -- It's better for each species, and they follow a normal distribution of its own, or do they follow a single one community-level normal distribution or a species-level normal distribution?

DR. GOYERT: They are drawn from that community-level distribution, and so there's a species-level distribution for each. They are species-specific.

DR. LI: Yes, that's what I am thinking. Okay. I know it's a species-specific parameter, and so, for example, we have five species here, and so we have five $beta_0$, right, and these five $beta_0$ follow the same normal distribution, or do they follow a different normal distribution? Do they follow their own normal distribution for the hyper --

DR. GOYERT: Yes, they follow their own.

DR. LI: Their own and not the community level. Okay. I was thinking like different species from the community and it was a community-level average.

DR. AHRENS: Those would be emergent properties, depending on the data.

DR. LI: But I am thinking, for your question, if the normal structure is structured in that way, like the different species follow a community-level hyperdistribution, you may be able to see the --

DR. AHRENS: No, I think I've answered my own question for myself.

DR. GOYERT: Thank you.

DR. AHRENS: The information in the data is uninformative at the community level on the $beta_0$ parameter, and most of that information is getting sucked up into the $beta_1$ at the community level, because of the smear, and I get it. I get it.

DR. GOYERT: I might also just add one thing. In my experience from running this on more species in the past, I think that you would see a bit less uncertainty, and I don't want to confuse things any more, but keep in mind that there is only five genera in this particular community, and, if we had a lot more to inform that community, those would probably be a lot narrower.

DR. SEDBERRY: Any other questions from the committee? Before we go to the action item, I need to take public comment on the presentation, and so let me just check and see if there's any public comment. I don't see any public. Okay. Thanks again, Holly. Again, this has been really informative. What is our action item here?

It's the usual kinds of things. It's the uncertainties and assumptions associated with the models to describe habitat probability and then determine whether this is analysis is the best scientific information available and appropriate for use in managing fisheries resources.

DR. AHRENS: I think we heard that there was some concern about the space for time substitution and the utility of that model for potential environmental changes in the future, and that was the only concern that I heard, but I think the modeling team is well aware of that and is attempting to address those issues.

DR. NESSLAGE: What is the process, moving forward? If we give the thumbs-up for this methodology, then, when it's applied to the South Atlantic, will the SSC have a chance to review the actual implementation prior to adopting it, because it wouldn't be BSIA until we actually have it for the South Atlantic, correct?

DR. SEDBERRY: Here comes Chip to answer that question.

DR. COLLIER: The process would be that we would come back to you through the amendment process, and then you guys would review the maps from there, but I want to make sure that we were stepping off in the right direction, because this is very different than what you guys have seen in the past and what we've used for coral habitats in the past, and so it's good to hear that you guys are onboard with this kind of modeling approach, and we'll see where it goes during the development of Coral Amendment 10.

DR. SEDBERRY: There has been some use of this modeling approach in the existing coral HAPCs, or at least in guiding exploration and some of the ROV cruises to look for appropriate habitat within the boundaries of the HAPC, and so it's not completely new, but this is certainly more detailed than we've had before.

DR. DUMAS: I would just like to say that I thought that the presentation was fantastic, and I think this is a great approach, and I like this very much. Two questions I have for the modeling team would be, going forward, if a modeling framework like this is developed for the South Atlantic, could they also think about how to use the modeling framework to predict maximally-informative future survey locations?

You have got your grid, and you could use your model to predict that, okay, if we had additional information from this spot, it would decrease our CVs the most, relative to getting information from some other spot, and so we could perhaps use the model to, looking forward, help us know

where to go survey to better inform our knowledge and improve the prediction capability across the whole area, if that might be possible with this.

Then, two, thinking about how this approach could be modified for application to corals that move, like snapper and grouper, so that -- Play with the model to look at, if your target elements were able to move by different amounts, how would that affect your prediction probabilities and your CVs and kind of do a sensitivity analysis to if the things you're trying to observe could move or had some -- Then how would that affect things, and then we could look at how snapper and grouper move and how far they move and perhaps move toward using an approach like this for some fish as well coral, and I think that would be great, looking forward to the future. Thank you so much.

DR. GOYERT: Thank you for that suggestion. I think it's a great idea, and you would just have to approach it in a slightly different way, because I think, to some extent, that would violate the closure assumption, and, depending on what kind of data you have, you might be able to look more at the abundance level, and then you would need to think a bit more about how to quantify that detection probability, and so be it via repeated sampling, or even something like distance sampling, for example, which I am not sure that people have implemented with fish. Definitely with marine mammals, but it depends on what kind of fish we're talking about, I suppose.

DR. SEDBERRY: Can we craft a consensus statement about whether this analysis is BSIA and is appropriate for use in managing fisheries resources at this point, or can we say anything about what potential this has for use in the South Atlantic region? I think we may be a little premature for managing fishery resources, but we might be able to say something about it as a resource, or not as a resource, and that's too confusing, but as an approach.

DR. SHAROV: Just a small correction. We are talking about a modeling approach here, right, because we have been looking at the example of the Gulf of Mexico, and so, formally, when you say best scientific information available, we don't have any results available in application to the South Atlantic, and we have an approach that seems to be -- Everybody has agreed that it's valid, and it's successful, and the group endorses it as a methodology, but I am not sure that BSIA is an appropriate term here.

DR. SEDBERRY: Can we say the modeling approach is a useful --

DR. ERRIGO: I would say don't get yourselves wrapped around the semantics axle. BSIA is just the term that everybody likes in the fisheries world or whatever, but it's -- Methodology is information, and so is data, and it's just different kinds of information. If you feel that the methodology is useful, like I put up there, that the SSC feels that the modeling approach is BSIA and recommends that it be further developed for the South Atlantic. Therefore, it will come back to you. Then, every time it's used for an analysis, the analysis comes back to you for review.

DR. NESSLAGE: I am not sure that I agree with that characterization. Maybe that's true in theory, but, in practice, we often spend hours arguing about the fact that we claimed something was BSIA a long time ago, and therefore we can't question it, and so I have yet to see information for the South Atlantic for this, and so, until I see the actual model application for the South Atlantic, I don't know how it's going to perform, and I don't know if they're going to run into other problems that they didn't in the Gulf, like the data is different or the whole region is different, and

I think we can recommend moving forward with this approach, and I would feel 100 percent comfortable with that.

I can't tell, until we see the application for the South Atlantic, whether it's BSIA for the South Atlantic, and I am not comfortable with that, and, just as a follow-up, slightly different topic, given that this will probably be used, I assume, for energy development, if BOEM is interested, and other offshore development activities, I get a little worried when I see a map with really low CVs of 1 to 7 percent.

I mean, that is going to be used for marine spatial planning, right, in many ways, and, unless those are complete closed areas for development, and I'm not familiar with the coral regions, and, if that's the case, I think we need to really question whether this is too highly certain of an approach, and I'm wondering if there have been previous -- I am not familiar with the previous approaches that have been used to map out corals in the area, but, if there are, I think you could probably do a comparison approach and take a sub-sample of the available maps or data that's out there and apply both methods and see which provides the better estimates, and is that doable, given previous methods that have been applied?

DR. GOYERT: I think those are all great points. Just one thing we wanted to point out was just that the absolute scale on the CV was not 1 to 7 percent, but rather seven-times the mean, and so sorry about that. It's the standard deviation divided by the mean, and so it's not a percent scale. I think it's 100 to 700, but I should check that, just to make sure.

MS. LANGE: I have the same concerns that Genny had. First off, BSIA, I think it's supposed to mean something, and I think Mike's comment that we just throw it out there I don't think is appropriate, and we shouldn't really be saying something is BSIA unless, number one, we really feel that it is, and, number two, that it's something that we can actually apply, and I don't think we're there yet. As Genny said, we haven't done anything with the South Atlantic data, and I don't know what data is available from the South Atlantic that would be useful, and I don't know if there is the same data, and, obviously, the group did the Gulf and not the South Atlantic for a reason, and I don't know if the data is not available for the South Atlantic to do the same analysis or not, but, again, I think the rewording here is better, and I agree with what's there now.

DR. POTI: BOEM funded us to do the Gulf of Mexico about one year prior to when they funded us to do the South Atlantic work, and so that's really the only reason that we're presenting that first. The deliverable date for the South Atlantic work is next summer, and so we'll have model outputs in the next few months with the South Atlantic data. We have already compiled all the data. It's just a matter of applying the framework once we finish the Gulf work.

DR. GOYERT: It's 100 to 700, because it's a factor of one would be 100 percent, versus a factor of seven would be 700 percent.

DR. ERRIGO: It's like the SERFS trends. One is the average, and two is two-times the average, and three is three-times the average.

DR. SEDBERRY: I think, once we have the information for the South Atlantic and the council is actually trying to apply it for use in managing fisheries resources, that would be the time for us to comment on it being BSIA for management of those fisheries resources, but I think the SSC can

make a statement about the usefulness of the modeling, and we see a lot of potential and look forward to seeing the results from the South Atlantic.

DR. AHRENS: I think -- Is it my understanding that there is MaxEnt output for corals as well?

DR. GOYERT: This, again, is something that Matt can speak to, because he was involved in that effort, and it dates back to I think 2015, and there are output maps that are online.

DR. POTI: We developed MaxEnt presence-only models in about 2013, starting in 2013, but those did not include the multibeam bathymetry information, because that hadn't been collected yet, and so this -- We're considering this as sort of a replacement of those models and improving our techniques while we also improve the data that goes into them, but those do exist, and I think Chip has them from 2013.

DR. AHRENS: I think, when it comes back to the BSIA discussion, when we get this modeling output, it would be worthwhile to compare and contrast the suitability of those methods to say which is a better approach to answer the question at-hand, as opposed to just going off of the datapoints. I mean, you can go off the datapoints, or you can use the MaxEnt, and we can use this occupancy modeling, community-based occupancy modeling, and we could use machine learning, or we could run GAMs, and so I think it would be helpful to -- If you're going to say this is the best scientific information available, in terms of the approach, to be able to contrast those at the time that we look at the output of those. I think that would really help, in terms of that classification.

DR. LI: I am just looking at the statement here for the wording, and do we want to say that it can be very useful, or we just say this approach is useful? If we say it can be useful, can be very useful, it sounds to me like there needs to be a condition under that, but, with our discussion, I feel like it is useful and it has potential.

DR. SEDBERRY: I agree.

MS. LANGE: But we don't know that it's going to be useful for the South Atlantic.

DR. SEDBERRY: It's still useful though.

MS. LANGE: Okay. All right.

DR. GOYERT: Just one thing to point out there is I think it might be worth thinking about how important species richness is, as opposed to just probability of occurrence for individual species, because that is something that we can get out of these models, as opposed to other previous approaches, or rather genus richness, if that's of importance.

DR. SEDBERRY: How does the wording that's up there now look?

DR. LI: I will suggest just to say this modeling approach is useful, and when we say it has potential, potential for what? It's not clear.

DR. AHRENS: The SSC recommends continuing with this modeling approach or further developing this modeling approach.

DR. SEDBERRY: Once again, thank you, Holly and Matt. We appreciate your input and all this work and the presentation. It is very useful.

DR. ERRIGO: Potentially.

DR. SEDBERRY: It's ten minutes to five. Is Erik still with us, or are we there yet?

DR. ERRIGO: Erik, I just unmuted you. Are you there?

DR. WILLIAMS: Yes, I'm here.

DR. ERRIGO: We were thinking of doing the Science Center's update now, and the schedule is a little off, and so we were hoping to do your update now.

DR. WILLIAMS: That's fine. It should only take about ten or fifteen minutes, tops, and so that's perfect.

DR. SEDBERRY: This is Agenda Item Number 8, and there are no briefing book documents, but Erik Williams from the Southeast Fisheries Science Center Beaufort Lab is going to give a presentation on the Science Center's research efforts.

SEFSC RESEARCH UPDATE

DR. WILLIAMS: I will be quick about this because there's not a whole lot here. A quick outline of what I was going to go over is just three sort of ongoing projects, a stock assessment model comparison project, a scamp connectivity study, and then give you an update on the ecosystem status report.

First, the stock assessment model comparison, and we got funding to do a comparison of stock assessment models, and it's a joint effort that involves the Southeast Center, the Northeast Center, the Northwest Center, and the Alaska Center, looking at different packages and basically comparing them. Again, here is the objective, to compare four stock assessment packages commonly used, and those four packages are basically the AMAK package, which is out of Alaska, ASAP, which Chris Legault largely developed in the Northeast, BAM, which you guys are quite familiar with, and Stock Synthesis.

It's a national-level project, as I said, and we've hired a post-doc, and her name is Dr. Li, and she's up at Silver Spring, and she is going to be traveling to each of the areas, and we'll sort of give her all the code and modeling stuff and send her on her way, to basically start this project, and that's pretty much it for right now. We're still working out exactly what sort of data we're going to feed the models for comparison. One of the first things we're going to do is just compare where the models do exactly the same thing and where they might differ a little, and then we're going to feed them sort of random data and some other sort of -- We'll test them more rigorously and compare

the outputs. I will probably let you guys just ask question about any of these after I run through the whole presentation.

DR. SEDBERRY: That will be fine.

DR. WILLIAMS: The next one is the scamp connectivity study, and I think I briefed you guys briefly on this the last time, but, just to give you an update on where we are, the objective of this study is to sort of quantify larval dispersal of scamp focusing on scamp, basically using some of these particle models that have been developed, oceanographic models, and the project is being led by a post-doc at our lab here, Roger Brothers, but there is also many contributors from state, federal, and academic labs.

Some of the initial results were detailed in the SEDAR 68 stock ID workshop, and here is sort of some figures to show what some of the data is showing, and so, in this map, you can see the blue and the red, and the blue is settlement locations that were released from the Gulf of Mexico and where they settled. If they are in blue -- Again, you can see a few blue made it basically around the tip of Florida and made it here, and red are basically released from the Atlantic, and you don't see any going in the other direction, which is kind of what we expected, given the dominant oceanographic currents that exist with the loop current here and then the Gulf Stream up the east coast of Florida.

Here is a closer sort of examination or a focus on just those points, those particles, that actually went from the Gulf into the Atlantic, and so those are shown here in green, is where they were released, and then blue is where they ended up, and here's another way to look at that. This is looking at all the particles, with the Y-axis showing where the particle were released, and then the X is where they settled.

What you can see is most of them are released and settled right near each other, and so, where they were released, they pretty much settled there. This little cloud out here is sort of the stuff that went from basically the west shelf of Florida into the Atlantic, and so this is a heat map, and so you can kind of see that the density here -- We're not talking about a huge amount, and, in fact, the data basically is suggesting that, as I just said here, most of the settlement is self-recruitment, and it stays local, but approximately 8 percent of the recruits in the Atlantic were spawned in the Gulf of Mexico, and approximately 2 percent of successful larvae spawned in the eastern Gulf of Mexico and recruit into the Atlantic, and so this is where we're actually trying to apply actual estimates of how much, what percentage, is going from one area to the other, and so this is our first sort of estimate of that. What we find from this is, although there is movement from the Gulf to the Atlantic, it seems to be at a pretty low percentage.

The last thing I was going to update you on, and this is just going to be a quick slide, is on the ecosystem status report, because I am sure that you guys are going to see the full report when it comes out, and it's being headed up by Kevin Craig and Todd Kellison here at the lab, and, basically, the update is that they're hoping to complete a draft pretty soon here, in the next couple of months, and then they will be soliciting reviews and feedback in 2020, and so I suspect that you guys will see it sometime in 2020, early 2020, and so that's all I have. I will take any questions on that, and then I know there's one other topic that you guys wanted me to discuss.

DR. SEDBERRY: Thanks, Erik.

DR. GRIMES: Erik, the scamp circulation connectivity model, is it, in I guess Mandy's usual way of doing things, it includes some parameters in the model besides just physics and circulation? I mean, is the larval behavior and that sort of thing incorporated in it?

DR. WILLIAMS: Yes, and I think they took their best guesses at larval duration as well as even I think they're looking at trying to model any vertical movement that might be occurring as well. I think that's the next step, but I'm not sure how good the data is on that, and so I mean, certainly, scamp-specific, I doubt they have really good scamp-specific estimates of larval duration, and so I think they're borrowing from probably groupers in general, or some other similar species.

DR. SHAROV: I have a question on your first subject. It's exciting, but how different is it from the tremendous level of exercise that has been completed prior to the 2013 World Stock Assessment Conference in Boston, where I believe the same set of models, including additional from the European area, were tested extensively with simulated datasets, and then the conference reviewed it in the course of like three days, and I'm sure you guys have looked at the results, and so if you could possibly summarize what are your expectations and what are you looking for, and I guess are you expecting some differences in the behavior of the models of the same class that could be modified, each of them, according to specifics of the stocks, and what are the major expectations of the group?

DR. WILLIAMS: That's a good question, and I think it's actually -- I was partially involved in that last effort, and I think they were just -- They were handed datasets, and then all the models were run, and they just wanted to see the performance of those models, and the datasets were based on real stocks, I think.

This exercise is actually more or less to really get down to basically show, if there are differences among these, exactly what they are and why they're different, to get down actually -- We are actually evaluating the code and like looking at each one and how they handle say selectivity, how they handle discards, and, basically, the idea here is to just get a thorough explanation of how these models differ and how they actually are identical, and we expect that, for the most part, they're going to be probably 90 to 95 percent identical, and it's going to be just some small differences, and we just want to highlight what those are and how they perform.

DR. SHAROV: Thanks, Erik, but you know, of course, which one is the best one, right?

DR. WILLIAMS: Of course, yes.

DR. SEDBERRY: Do we have any other questions or comments from the committee?

DR. BUCKEL: This doesn't have to do with what you presented, Erik, and I'm not sure what you were -- You said you had another item, but the question I have is the gray triggerfish holding study, the validation of ages, and what's the status of that project?

DR. WILLIAMS: It kind of got delayed, in the sense that we're in the midst of actually upgrading all of our microscope systems here, and we're waiting for the new systems to get fully set up to analyze the triggerfish spines, because I guess these new scopes are much better for detecting the mark and looking at these spines in a better way, and so, yes, that's where we are, and I think

Jennifer has got the new system set up, and they're testing them, to make sure that the systems are performing correctly, and then I think they're going to move into that phase of analyzing those samples.

DR. BUCKEL: Great. Thanks, Erik.

DR. SEDBERRY: I think Erik wanted to talk about one other thing, but, before he does, I wanted to see if there's any public comment on the research presentation, the research projects going on at the Southeast Center. Is there any public comment? No, and so, Erik, did you have anything to add?

DR. WILLIAMS: Well, I think the other thing you guys had me down for is to discuss wreckfish.

DR. SEDBERRY: Right, and we have that on the agenda.

DR. WILLIAMS: I think the specific question was could we do a wreckfish assessment in 2019/2020, and, with my full hierarchical Bayesian model with full uninformative priors, I can safely say that there's about a 0.01 percent chance of us being able to do a wreckfish assessment in 2020.

DR. ERRIGO: Erik, what about the general outlook on getting an assessment wreckfish and not in 2020, but at some point?

DR. WILLIAMS: The outlook is -- I think that's a good question, and I think it has to be put into the SEDAR cycle, is the answer, and it has to be prioritized through SEDAR, through the SEDAR Steering Committee, if it's important enough, but it has to be put in the cycle, because, right now, all of my analysts are fully tapped out, and so there's no excess work capability here that I could assign that to anybody.

MR. CARMICHAEL: Erik, the last time that was talked about, the concern came up, and I say this was pre-Clay, about the U.S. fishery and data programs and only having access to a small portion of the resource, and so there was concern about doing a U.S.-based SEDAR assessment and that something needed to be done on a much broader scale, and that was kind of where I think it was left, to hear some more from the Center about it, like what are some of the avenues for doing that.

DR. WILLIAMS: I mean, I guess we could make a push for ICCAT to take this over, because it seems like it could fit in that in some ways, although it's not a tuna species, and I don't know. Honestly, I don't know if that effort is absolutely necessary, in some ways. I mean, if you think about our fishery and the way it operates, it's sort of a stop along the big cycle around the whole Atlantic gyre, so to speak, and it's fed by recruits from somewhere else, or fish from somewhere else. In some sense, the way to model that is just through a basic stock assessment, but assume recruitment is just constant, in some ways, and then you just move forward from there, and then you just establish some proxy benchmark for that stock that you have there.

MR. CARMICHAEL: I think that's not that different from the way that spiny lobster in Florida is approached, where they presume that the recruitment comes largely from the Caribbean, and the management is really just about maximizing yield per recruit.

DR. WILLIAMS: Yes, and I think that would be the way to go with wreckfish as well.

MR. CARMICHAEL: That's a little progress, at least. Thanks.

DR. WILLIAMS: It's not much, but we're tapped out. It seems like it wouldn't be that difficult of an analysis, but, then again, I say that, and I always end up regretting saying that.

MR. CARMICHAEL: We'll put this on the list of things Erik said and later regretted.

DR. SEDBERRY: Does the committee have any additional questions for Erik? All right. I don't see any. Thank you, Erik.

DR. WILLIAMS: Thanks, guys. Good luck with the rest of the meeting.

DR. SEDBERRY: Thank you. We have time left. Because we've been so efficient this afternoon, we have time left for one more item on the agenda, Agenda Item Number 9, which is the blueline tilefish OFL and ABC, and I had Marcel, who is no longer with us at the meeting, and Fred Scharf to take notes on this, but this is a pretty short item, and so maybe Fred can handle it by himself, and so are you going to review this? Okay. Mike.

CLARIFICATION OF BLUELINE TILEFISH OFL AND ABC

DR. ERRIGO: All right. First, let me start by saying I'm sorry, and I think there was a misunderstanding with my semantics comment. I am a little punchy and tired, and what I meant was you don't have to worry about saying this is the best scientific information available, and what we came to, I think, was a good way of putting it. It sounded like I said don't worry about it, and we'll just put best scientific information available up there and it doesn't really mean anything, and that's not what I was trying to say, but that's kind of like what came out, and sorry about that.

Now blueline tilefish. There is an abbreviated framework amendment to change the ABC and ACL for blueline tilefish based on SEDAR 50, and that's the old MRIP numbers, and we still have to -- It's on the SEDAR schedule for the new numbers, but, during the IPT development process, the question came up of how do we get the ABC for the whole area, and I said, oh, you just add the portion north of Hatteras to the portion south of Hatteras and that's how you do it, and I guess Shep was looking through the SSC notes and things, and he couldn't find where that was explicitly stated, and so he would like if you would please clarify explicitly that the intent of the SSC is that, when setting the OFL and ABC for blueline tilefish in the South Atlantic's jurisdiction, that the intent is to -- You take the values from the small portion of the stock that's north of Hatteras to the Virginia border and you add those to the values for the rest of the South Atlantic, south of Hatteras all the way down to the end of the South Atlantic's jurisdiction, and so, if that is your intent, please say so.

DR. CROSSON: As the Chair of the SEDAR 50 Review Panel, and as the Chair of the Ad Hoc Working Group that worked out the agreement with the Mid-Atlantic SSC, the answer is yes.

DR. SEDBERRY: So we need a sentence.

DR. CROSSON: Yes, that is the SSC's intent, and it's also the way that we were asked this question by the council. We weren't asked to come up with separate ABCs. If they wanted to manage those areas separately, that's something they should consider. I mean, localized depletion may be an issue, but that's up to the council to decide. Fred, did you get all of that?

DR. SEDBERRY: Good job. Any additional discussion on this agenda item? Any public comment on this agenda item? Okay. What do you think? Can we do one more? We can do the SEDAR. Jeff and Eric are taking notes on this section.

SEDAR ACTIVITIES

MS. HOWINGTON: Hello, everyone. I am Kathleen Howington, and I am the SEDAR Coordinator, and there was a couple of additions and edits to what we're going to go over today, and so I'm just going to let you know that it's a little bit different than what's in the overview. I am going to be reviewing two schedules for SEDARs that are already occurring, and then we'll be going over two SEDARs that are hopefully going to start next year, and then we'll also be going over the TORs for one of those, but, as you can see on Mike's screen, we will not be going over the TORs for the 2021 assessments. We're moving that to the next SSC, and so don't worry about that. You're all good.

All right. First things first. For SEDAR 59, South Atlantic greater amberjack, that had to be put on pause due to the government shutdown, and then it also had to be put on pause due to the SSC workshop that occurred in August, and so it has since started back up, and you can see the schedule here. We are now down to here. As you can see, we had the workshop on August 19th through 21st, and we are actually having our first assessment webinar for SEDAR 59 on November 1st, that Friday of the week of October 28th, and then we're hoping to be able to finish everything up and turn around and get the finalized assessment report to you by the next SSC meeting in April, and so that's the goal. If you would like to be added to the interested parties list, just to kind of get updates on when the webinars are occurring, please feel free to ask me.

Then the next one is SEDAR 60, and it's the same deal. It had to be put on pause due to the government shutdown and then also due to the SSC workshop, and so here's the new updated schedule. There will be an in-person workshop for the SEDAR 60, red porgy, that is going to be occurring at Beaufort, North Carolina on December 10th through 12th, and then we're going to do two assessment webinars after that, and hopefully turn around and get you the assessment report in April of 2020. Once again, if you want to be added to the interested parties list, just let me know.

Those are the two assessments that have already started, and I am just giving you an update. Then, for SEDAR 66, South Atlantic tilefish, just to remind you, the TORs and schedules were already approved, and that schedule also had to be updated, due to the government shutdown and the SSC workshop, and so now the schedule reflects both of those dates of -- It's going to start in April of 2020, and then hopefully we will get the final assessment report to you in April of 2021.

For SEDAR 66, there is going to be an in-person workshop in Beaufort, North Carolina in November, and the reason why we're bringing this to your attention is because the participants

had already been approved, but I am now bringing these dates to you and asking if the participants are still okay with participating, and so the people I have from the SSC are Genny, and are you still good? All right. Churchill, you're still good? Fantastic. Then Luiz Barbieri is no longer here, and so I am also requesting a new Luiz. Is anybody willing to fill his spot?

DR. SEDBERRY: Any volunteers?

MS. HOWINGTON: It's April to April, and there's only one in-person, and everything else is webinars.

DR. LANEY: I was holding out for gag. I know what a gag looks like.

MS. HOWINGTON: That's coming up next.

DR. LANEY: Yes, and I would like to volunteer for gag.

MS. HOWINGTON: We're talking about tilefish now. If you say that I volunteer, I'm writing you down for tilefish. Anyone?

DR. SEDBERRY: Put me down.

MS. HOWINGTON: All right. I've got George.

DR. SEDBERRY: What year is that?

MS. HOWINGTON: It's next year. It's April of next year to April of 2021.

DR. SEDBERRY: Okay. That's good, because I will no longer be Chair of the SSC.

MS. HOWINGTON: All right. Then we're also going to go to this, and I do want to add one edit. SEDAR 71 is gag grouper and not 72. It is 71, and everything else about this PDF is correct, but it is SEDAR 71, and that is correct in your agenda, but it just for some reason didn't get changed on this. For this, we are asking for the approval of the gag assessment schedule and TORs, and so we have our terms of reference right here. It's Attachment A05, and it says SEDAR 72, but it's actually 71, and I'm going to keep repeating that. Sorry. Does anyone have any comments that they would like to discuss?

DR. SEDBERRY: Any comments on the terms of reference for SEDAR 71?

MS. HOWINGTON: SEDAR is moving away from benchmark, and it is now going to be an operational.

DR. NESSLAGE: When we covered the unassessed stocks, there was a mention of black grouper failed, largely due to ID issues with gag, and is that -- Is that accounted for here at all?

DR. ERRIGO: The second bullet.

DR. NESSLAGE: Thank you. I'm good.

DR. SEDBERRY: Any other questions or comments or changes? The SSC approves? I see nobody disapproving.

MS. HOWINGTON: Lovely. All right. Then the next thing is SEDAR 71, South Atlantic gag grouper schedule, and so the goal is to have our TORs, the schedule, and the appointments approved in December of 2019, and then the first data scoping webinar is May of 2020, with then webinars occurring in October and November and into 2021, with the complete assessment report in March of 2021 and the report to you guys in April. I would love to request participants from the SSC.

DR. SEDBERRY: I see Wilson.

MS. HOWINGTON: Anyone else?

DR. CROSSON: This is all webinars, and there is no in-person?

MS. HOWINGTON: Yes, this is all webinars.

DR. SEDBERRY: Easy-peasy.

DR. CROSSON: You can put me on.

DR. SEDBERRY: Anne, are you volunteering?

MS. LANGE: If I'm still here.

MS. HOWINGTON: All right, and so I have Wilson, Scott, and Anne. Thank you. I believe that was it for me, but -- No, we've got one more. I am going to give you guys a little bit of some background. When the SEDAR Steering Committee met, they asked that the council consider moving the red snapper research track assessment to an operational assessment.

If that were to occur, and the council decides to approve the move of red snapper from a research track to an operational assessment, then that means that red snapper operational would need statements of work and TORs, and so, in preparation for that, and then also in preparation for, if that also happens, then the timeline would be truncated, and there would be more time for analysts to potentially look at other species, and the SEDAR Steering Committee also requested statements of work for vermilion snapper and blueline tilefish, and so that is what we are pulling up right now, is those statements of work. While we are doing that, for one second, we are going to switch topics and talk about SEDAR 64 instead.

MR. CARMICHAEL: You guys know that you have a bunch of assessments that you will need to review coming up this spring, and one of those is yellowtail snapper, and it's been done by the FWC in Florida, and thank you, Florida, for doing that, but that's a joint with the Gulf, the management, and so I've been talking with the Gulf Council about doing a joint review effort, and we've done this sometimes in the past, with like spiny lobster and yellowtail, because we don't want to end up having two ABCs from two councils for one stock.

What we're looking at is potentially, and I will see if you guys support this idea, is having a contingent from the South Atlantic SSC go to the Gulf Council SSC to be held in Tampa in May, and that's really convenient for the Florida guys, since they're right there in St. Pete, and then you would participate in their discussions and coming up with an ABC for the yellowtail snapper stock, and we'll take a group of SSC members, or if everyone is willing to go down there or what have you, and the council will support that. If it's just a subset, I think that would be fine too, but your role would be to represent this SSC and take part in those discussions and provide an ABC recommendation for the yellowtail snapper stock overall.

If it turns out that there's a lot of SSC interest and a lot of people are available to go down there, we may look into any other issues that we have with the Gulf that we may want to talk about for a joint effort, and so I just wanted to get you all's feedback on this and how you feel about doing that, and then we'll bring it up with the council in December as well, and we'll work out more of the details at that point, as far as the timing, but it will be -- I think sometime in mid-May is when the Gulf meeting is likely to be.

MS. LANGE: How does that relate to the yellowtail snapper assessment that's in progress right now, and we've already had our first two webinars?

MR. CARMICHAEL: This is to do the ABC recommendations for that assessment that's underway now.

DR. CROSSON: John, you're asking what we should do, and whether we should have a sub-committee of this committee or whether we should be trying to all meet or a webinar, and is that what you're asking the committee for feedback on?

MR. CARMICHAEL: I'm asking for some feedback for how you're willing to operate to conduct this joint review. Are you as an SSC overall willing to allow whoever can and is willing to attend that meeting to represent you and do that, and others would be available to participate over the webinar as well, but we just want to make sure that we have a core group that can attend if we do that, because sometimes participating over webinar can get a little bit difficult, and so we want to extend it to whoever can make it, and so I would like to get a sense of if you all -- Would you allow a subset to do that, and would you be comfortable with that approach, and then how many people would be willing to go and make that trip?

DR. SEDBERRY: I think it's a good idea. I would be willing to make the trip.

DR. SCHUELLER: So this is going to be -- The meeting would be after we see the assessment as an SSC, because it's reviewing --

MR. CARMICHAEL: No, it wouldn't. It would be when the assessment is discussed, and you wouldn't be seeing this assessment in April and then going to the Gulf meeting. This would be seeing that assessment.

DR. SCHUELLER: Why not?

MR. CARMICHAEL: Why not what?

DR. SCHUELLER: Why wouldn't we review it in April and sort of have a consensus? Therefore, the group that was going to the Gulf could --

MR. CARMICHAEL: Well, we want to have a single review of the assessment. For one thing, if we have two separate reviews, then we have the potential of separate issues coming up and not really getting discussed by both SSCs, and it would be having the Florida folks who worked on this assessment come to two separate SSC meetings, and so, if this SSC is not comfortable with having a sub-group, then we can just have all of our SSC go down there and participate in the review of that, but we don't want to get into a scenario where we look at it in April and they look at it in May, and there's also a time concern. You already have a number of other assessments to look at in that meeting, and so this is one way of trying to balance the workload.

DR. SCHUELLER: I think Alexei and I are down for the review workshop. Does that mean that like --

MR. CARMICHAEL: This isn't the review workshop.

DR. SCHUELLER: No, I didn't ask my question. Are you hoping to have the folks that participate in the review attend the meeting? That's all that I wanted to know.

MR. CARMICHAEL: I mean, they could, but it's not necessary that they do. Ideally, they would.

DR. CROSSON: This is one ABC that covers both regions, right, and you don't have to split it up, and this is not like blueline tilefish, where we tried to split the ABC between two different regions.

MR. CARMICHAEL: This is a single ABC, and the councils already have a split between the two jurisdictions worked out that would be applied.

DR. CROSSON: Because, I mean, we do have a model for what we just did with blueline tilefish, where we had a sub-committee that was made up of -- Or it's a joint committee that was made up of an equal number of members from both SSCs, plus a couple of council staff from each of them, and that's another model that we could follow.

MR. CARMICHAEL: That was a little different on blueline, because we had to work out the split, but, as I recall, we did send some of our members to the Mid-Atlantic SSC meeting where there was discussion of this, and we have also had the precedent of we've done this jointly with the Gulf for the prior yellowtail assessment and for the prior spiny lobster assessment, and we have kind of let the Gulf take the lead, just because of the geography of Florida having done those assessments.

DR. DUMAS: If this meeting is in May, could we do all of our South Atlantic SSC business at that meeting, or just before or after, so that we only have to travel once?

MR. CARMICHAEL: You could. That is a possibility. If you guys didn't want to say send a subset, then we could try to coordinate, where maybe our SSC could meet a couple of days before or after this joint meeting, and it would need to be held in Tampa, and so we would be traveling somewhere different, which I don't know how others would feel about moving that far out of our area of jurisdiction for our whole SSC meeting, and that's kind of the only reason we really didn't

think about that, but, if everyone really wanted to go, and you weren't happy with a potential subset going, that is an option that's on the table.

DR. AHRENS: I think the only concern there would be if you're reviewing the assessment and there is some significant public comment and those individuals wanted to attend in person, that would be fairly exclusionary at that point.

MR. CARMICHAEL: We will also be reviewing our porgy and greater amberjack and king mackerel, and so you already have three assessments, plus yellowtail, to be reviewed at that time. The other thing is the Gulf is also reviewing an update of Gulf cobia, and the Gulf has the lead over that stock, but a portion of it does roll into the east coast of Florida, and so you don't have a role in setting that ABC, but it might be of interest to you to see how that assessment is, and there may be some management actions and such that come, at least for you to comment on, and so you may want to have just some insight into how that assessment has gone as well.

MS. LANGE: But part of the group could participate by webinar, and so not everyone would have to travel, even if it was decided that it should be the whole SSC that participated, right?

MR. CARMICHAEL: Yes, that is correct, but we would encourage a contingent to travel, just because of the webinar, and sometimes it can be a little bit of a disadvantage for people who are participating on webinar, and I particularly bring this up because that was an issue a number of years ago in the spiny lobster one, where some folks on the webinar had difficulty participating, and so we don't want to rely as heavily on the webinar if we can avoid it, but webinars have gotten a lot better, as we've seen here today, and participation has gotten a lot easier over the years.

DR. SERCHUK: From our perspective, we need to make a decision now about whether we're going to send SSC members to this meeting in May, a joint meeting, or whether we're going to try to hold our meeting in May, at that time, and it relates back to one of the last agenda items here, which talks about our next meeting, our spring meeting, and we're given a couple of choices for April, and then we're given a choice for early May, and I don't know what's been envisaged for this joint meeting with the two SSCs, and will it take place before the May meeting or after the May meeting, and what the timing would be, but I think it's important to know now whether we're going to have a separate meeting in Charleston or whether we're going to have a meeting in St. Pete in May, or, if we meet in Charleston, whether we're going to have people that will go to the meeting in St. Petersburg.

MR. CARMICHAEL: That's the question before you, yes. Do you want to have a meeting in Charleston and then allow a subset of your SSC to represent you, for the purposes of setting an ABC for yellowtail snapper, or would you prefer to send your entire SSC contingent to that meeting with the Gulf and deal with the yellowtail snapper ABC, or would we attempt to hold a South Atlantic Council meeting say on Monday, Tuesday, and Wednesday, and then have a joint Wednesday afternoon, and then you guys could go home, and do that in Tampa, but, we as the council, we're not as enamored of that approach, for the reasons we mentioned, about the other assessments and business that we have to do, and we're concerned about potentially disadvantaging some of our fishermen and others who might want to come, and that would be additional travel for the Beaufort Lab, who has done the lead on those assessments, and so that's not really our preferred option, but, if push came to shove and we had to do that, we could do that.

DR. SCHARF: Just in the interest of moving us towards a decision, I would vote for the first option, which is that we hold our normal SSC meeting here and send a sub-group to the meeting in Tampa. I have the utmost confidence in the members of our sub-group, as long as it's not me.

MS. LANGE: I agree with that, that we would have our own meeting and have the joint meeting down there with some people participating by webinar if they can't make it in person.

DR. SEDBERRY: That sounds good to me, too.

DR. SERCHUK: Okay, and, and if we decide to hold the meeting in May here, and one of the dates is May 5 to 7, then, presumably, the group that is going down to Tampa, or going to participate, it will be later than that? I mean, how much flexibility do we have in terms of setting up that meeting, the joint meeting?

MR. CARMICHAEL: Good point, Fred. We do have a fair amount of flexibility, and I think we would like to avoid, under either scenario, setting our meeting in May, and one of the biggest reasons is that really greatly limits your time to prepare your report and get it to the council briefing book. We have done that sometimes, as a fallback option, but we would much rather prefer to still hold our regulation meeting in April, and it gives more separation between the joint meeting, and it gives you more time to finish your report.

DR. SERCHUK: Okay, because one of the things that's down here for one of the April meetings is it says it overlaps with MREP, and so there was a potential conflict there as well, and I just raise this now, because setting the meeting dates is pretty important, when people can attend the meeting.

DR. SCHUELLER: One of the big notes that I had on our next meeting date is that April 21st to the 23rd overlaps with the Fisheries Service National Stock Assessment Workshop, and so, theoretically, the assessment scientists that would be coming to present, as well as hopefully myself, will be at the workshop, and so that's a big conflict for that week, too. I feel like it doesn't seem like anybody wants to commit to it without knowing what the exact dates are going to be for the meeting at this point, and so I don't know if this something we need to hammer down dates for at least our meeting, and then you guys hammer dates down for the Gulf joint meeting, and it's something we do over email or what, but --

MR. CARMICHAEL: If you guys agree with the concept, as Fred and Anne expressed support for, then we can iron out the dates and figure out who can actually attend, and thanks for bringing up the NSAW. We weren't aware of the scheduling of that. April has gotten incredibly busy, and, as Fred noted, with the MREP being moved to there, it will likely be that we have to overlap something, just to get our meeting in, unfortunately.

DR. SERCHUK: Just so I understand, this item on the agenda, which is one of the last items on the agenda, will we do this item by email, to try to reconcile things, because I'm not really quite sure what is happening now. We've got an early date that overlaps with the National Stock Assessment Meeting, and we have another thing that overlaps with MREP, and then we have a choice in May, which you're indicating is not the preferred one, because it's so late, and so I'm not sure how it's going to be decided tomorrow, because we won't have resolved these

uncertainties, and I don't know when the joint meeting will take place either. Do we know when that will take place?

MR. CARMICHAEL: I can find that out from the Gulf, now that you guys seem to have some support for that, and I can verify what dates they are thinking it will likely be, and I will tell you that the Gulf Council has not always worked as far ahead as us, in terms of setting up their meetings, and they have some approximate dates, and I'm not exactly sure, and so I may not be able to tell you exactly what week they're going to do, but I will ask the Gulf Council staff when it is, and I think, if we're not able to come up with a week in April that's ideal for everyone, we may just have to gather your feedback and then a decision be made by the council as to what's the least obstructive thing to overlap.

I think the NSAW is probably one thing you can't overlap, given the nature of this business and the stock assessment people that have to come, and so we may end up overlapping the MREP meeting, perhaps, which I don't think is a particularly major inconvenience, at least for this committee and its operations.

If folks aren't aware, the MREP we're talking about is the Marine Resource Education Program, and it's a training for fishermen, and this would be the science workshop. In the past, people like me and Clay and Luiz and other folks have been the presenters at that, and it's held down in St. Pete, at the FWC Lab.

DR. CHEUVRONT: John, that's the management workshop. The science workshop is in February.

MR. CARMICHAEL: That's right. That's the management one. Brian and I have participated, and managers, and some council staff, and so I don't think it's a major overlap of science people and all, and so we could be okay.

DR. SERCHUK: So, essentially, we have the date set then as April 28th to 30th, and is that what you're saying?

MR. CARMICHAEL: That certainly seems like the preferred date to avoid the NSAW, yes.

DR. SERCHUK: Okay. I don't know what my calendar looks like then, but --

DR. SEDBERRY: Meanwhile --

MS. HOWINGTON: Are we good with yellowtail?

MR. CARMICHAEL: I think so.

DR. SEDBERRY: I think so, too.

MS. HOWINGTON: All right. Going back to the statements of work, just reiterating that this was a -- The SEDAR Steering Committee asked that the council potentially move the red snapper assessment from a research track to an operational, which means we need a statement of work for it, and it also means that the time slots would open up some additional potential assessments, and

so we went ahead and did three draft scopes of work, and the first one would be for red snapper, and you should have gotten this email, but it's also up on the screen. Are there comments or questions or concerns?

DR. SHAROV: What is the reason for moving it -- Is it a final decision then, and why I guess the council is trying to move it from a research track to --

MS. HOWINGTON: The SEDAR Steering Committee met, and, when they did, Clay actually came forward and said that he believed that the data requirements of what everyone wanted to try and integrate could be done in an operational assessment, which could then mean that potential management could happen a little bit faster than -- If it were a research track, it would be a much longer time period between start and end, and then having to do an operational assessment after that, before any kind of management decisions could occur. It was still a request, but we went ahead and did the scopes of work, just in case. If the council decides to do that, we'll be prepared.

DR. LANEY: George and Kathleen, under the data updates, I was just wondering if life history includes prey and diet information, and is that part of what we consider when we're talking about life history? The only reason I ask that is in the context of an earlier discussion today with Jeff about red snapper diet and in the context of what we've heard anecdotally from some of the fishermen that there seems to be a shift in dietary preference of red snapper to black sea bass now, perhaps. At least some of the data, I understand, are showing a fairly significant percentage of black sea bass in their diet, but is that part of what we consider when we talk about life history?

DR. ERRIGO: We could make that explicit in there, under that bullet, to just have a sub-bullet that says including dietary changes or shifts in dietary preference, something like that, to make sure that that gets looked at.

DR. AHRENS: Would that be for potential changes in growth rate or mortality, which would be common inputs to stock assessments? I am just curious of the rationale for why that diet change would drive some of the life history inputs, and is there suspicion that there's been a change in growth or mortality as a result?

DR. LANEY: I wasn't asking it from that perspective, Rob. I was just asking it from the perspective of -- In the interest of trying to understand a species' life history, one of the aspects of that is what does it eat, and that plays into the climate vulnerability assessments that we're doing, from the standpoint of whether or not a given species is more or less vulnerable to ocean acidification and so forth and so on.

Now, I suppose it could affect growth rates, if black sea bass turns out to be nutritionally superior to some other prey that red snapper consume. Is a black sea bass nutritionally better than a blue crab? I don't know. It could play into it, but I was just asking strictly from the perspective of what does the SSC consider to be -- What does that term "life history" encompass?

DR. SEDBERRY: This is what SEDAR needs to do the stock assessment, the life history aspects that are needed for the stock assessment.

DR. SERCHUK: I probably should have asked this question earlier, but what was the rationale, initially, for going to asking for a research track assessment for red snapper?

MS. HOWINGTON: That was before my time, and so I am going to look to John to -- Have you got it?

DR. ERRIGO: I will see if I can take that. Actually, I think, originally, the SSC did not recommend a research track, but the council requested it, and they felt that the kinds of changes and things that they wanted the Science Center to look at were large changes, and they wanted to make sure that they were thoroughly looked at and vetted and whatever changes that needed to be made could be made, and so they thought that the research track would be the best way to do that.

At the last SEDAR Steering Committee, after looking at all the different -- The terms of reference or the statement of work that was given to the Science Center, Clay looked at it and said, well, it seems that we can do this under an operational assessment now, and I don't think we need a research track to implement any of these changes.

DR. SERCHUK: I guess my response to that, and I will accept that, but my response to that is we have had other -- You are going to a research track because there's a lot that has happened in terms of either model development, or data collection systems have changed, and there's new scientific developments that the old framework for doing the assessment may not be appropriate any longer, and so you want to have sort of a full examination of datasets, of assumptions, of model frameworks, because science marches on, and I get a little bit concerned when I see five years have passed since the previous assessment, and there have been changes in data collection systems, and there have been changes in fishery-independent surveys and so on and so forth and that these sort of changes that go into the inputs to the assessment are so essential that they require a full examination across the board.

I realize that's what a research track assessment is supposed to be, and I understand that you have to counterbalance that. Well, it's been this long since we had the assessment, and we actually really need to get on top of a new evaluation of the stock, but one has to be careful with, for example, looking at selectivity concerns. Are they going to be such that the decisions made there are going to be very much different that went into the baseline framework that is being used?

To go to a research track generally has a large scientific rationale for doing it, and I hate to see that as a general situation. If it's decided that, well, wait a second, we're dealing with an old assessment here with a framework that perhaps really needs to be looked at in more detail, because, basically, we said, well, we actually need an assessment quicker than it can be delivered by the research track protocol and then going to an operational assessment using an old framework, and, again, I'm not criticizing anyone, but I'm thinking, if you're thinking about going to a research track assessment, it really requires a soup-to-nuts evaluation of all the inputs that go into the assessment, and, because the assessments tend to be done here, in many cases, five and six years later, you are bringing a lot of -- You are bringing a technique that is that old to the assessment, and that's all.

MR. CARMICHAEL: This really got started in October of 2018 at you all's meeting, and the real impetus of this was this had been planned as a research track for a while, and one of the concerns was the changes in the data and the way that the recreational catch is estimated during the mini-seasons and such, and so it was sort of leaning toward the research track approach.

There was discussion in October, last October, about the Florida FWC selectivity study, and there was discussion with Erik here in the room, and it was mentioned that the Science Center, at that time, thought that an operational assessment, because our operational assessments provide a fair amount of flexibility in allowing changes, and that's why we go through this scope of work, where you specify the changes, and gives the Science Center a time to say do they think they can accommodate those changes.

You recommended that the next assessment be a standard. Since that time, that's essentially what we are proposing here, and we have just dropped the standard terminology, and we now use the terminology of operational assessment, and this is very similar, what was proposed here, to what would have been done years ago as a SEDAR standard, and so the SSC recommended that the council consider doing red snapper as a standard assessment in October of 2018. The council discussed that in December, and again in March, and they raised concerns about making sure that the selectivity issues primarily were addressed and that they did get the best assessment that was possible.

Now, the Science Center came back, at the Steering Committee meeting, as Mike suggested, and tried to tell the council that they felt they could address the changes the council was interested in through the operational assessment framework, and so that's why they have asked the council now to consider doing this as an operational assessment.

Our way to try and work through this is to give you a chance to specify what would be changed in this operational assessment and then to allow the council to look at that, and, if that addresses everybody's concerns that the changes that need to be made are being addressed, then we can go ahead and clear the way to do this as an operational, and so they would be looking at the datasets, and they would be looking at these different estimates, and they would be bringing in the MRIP, and they would look at the selectivity issues and the things that are specified there.

Ideally, this would let it get done faster, and we would plan to have a workshop, probably, in doing this where the SSC can participate, and not just webinars, and so it's actually come from the SSC, and so you did request an operational assessment previously.

DR. SERCHUK: Just one other question, if I can. Is the level of peer review of the assessment the same under a research track as it would be under an operational assessment?

MR. CARMICHAEL: No. The peer review of a research track is an independent panel review, and that's another reason why it takes considerably longer.

DR. SERCHUK: But that's another reason why, in general, if you're dealing with a lot of changes, it's important to get an external review of it.

MR. CARMICHAEL: So what do you guys think is different now from what you said a year ago, because you're getting what you asked for a year ago. One of the reasons the council is interested in this -- It is about the timing, but we also have a stock which, as we've seen in the MARMAP surveys, is becoming one of the most popular fish out there, and it has steadily increased in abundance in surveys for six or seven years and counting, and it's still managed under an assessment created at a time before any of that could be accounted for, and so there's a lot of thought that the stock clearly is a lot more abundant, and waiting another three years to get that in

there may continue to cause problems within the fishery and probably continue to lead to waste, in terms of discards.

DR. SERCHUK: I am not disagreeing with you, John, on that, believe me.

MS. HOWINGTON: Does anyone have any additional changes or anything that they would like to add or anything that they think needs to be updated that they would like the council to see on this?

DR. NESSLAGE: Please don't hate me, but I'm going to take -- I am a little concerned about the statement under the third bullet, that the SSC found this study to be BSIA. I was just going back through our final report, and I know we were tasked with determining if the study, the chevron trap selectivity study, was BSIA, but we were very, very careful about how we worded that section of our report, because that survey was providing information on relative selectivity among the two gears, and it was not age-specific, and so, therefore, it indicated that our selectivity curves might be a different shape than what we've been assuming, but, because it was an age-specific -- It wasn't generating age-specific selectivity curves, and I think we pushed back a bit on the BSIA language, and so I don't know if it's possible to steal our wording about how this was a well-designed and well-executed study with valid analyses quote instead of the BSIA, and that would make me feel so much better, if that's possible.

MS. HOWINGTON: That doesn't make me hate you at all. I think we can do that.

DR. ERRIGO: Yes, and I can wordsmith this like that, and that's fine. I was more loose with the terminology for this one, because the SSC specifically reviewed it for red snapper, and so, being that this is for the red snapper assessment, I was a little more -- And this was very last minute. The SEDAR Steering Committee met, and I had to construct this after the briefing book had already gone out.

MS. LANGE: Just sort of following-up on Fred's comment, everything is new, and we no longer have standard and benchmark. We have operational and research, and does the operational assessment that we're talking about doing for red snapper allow us to put in new datasets? We could not do that when we did a standard assessment before, and we had to go to a benchmark. Is that still the case, or can we can add new datasets that have come up since the last time we had a standard assessment or benchmark? We can? Okay.

DR. BUCKEL: I don't know if we need to get into potential implications of projections with the new amendment for descending device requirements, and so I think the terminal year is probably going to be 2019, and so that's not going to be an issue for the assessment, but, for projections, if there is a decent amount of compliance with descending devices, then that discard mortality for projections might go down, and so I guess just to make a note of that, for the analysts to consider that.

DR. ERRIGO: Would that be like sensitivity runs or alternative projections that might be used?

DR. AHRENS: I think those would be sensitivity as well as probably the inclusion of the MyFishCount information, and that would probably fall under sensitivity.

DR. ERRIGO: Actually, that data is already in there, the MyFishCount.

DR. AHRENS: I think there is some recent work from the Gulf about adoption rates of descending devices and stuff that would be useful, out of Will Patterson's lab. I think the work in the Gulf has shown certainly a decrease in the mortality. The bigger issue is the adoption rate.

DR. SEDBERRY: But the compliance rate could be a sensitivity analysis.

MS. HOWINGTON: Okay, and so does anyone else have any comments or suggestions or things that they want to potentially talk about for red snapper? Anything else for red snapper, for this scope of work? Awesome. I would like to reiterate that this is based on if red snapper moves from research track to operational, and these are the potential scopes of work for vermilion snapper and blueline tilefish.

Let's do vermilion snapper first, and it's an update from SEDAR 55, which was a terminal year of 2016, and it allowed four to five years of new data, and then you can see the potential data updates there. Is there anything that anyone wants to add and/or comment on? Going once, going twice. Awesome. All right. Moving on, we're going to finish this, and it's going to be great.

Blueline tilefish is an update from SEDAR 50, which had a terminal year of 2016, and so, once again, we're adding four to five years of new data, and then, as you can see the data updates there, and is there any comments or additions?

DR. GRIMES: Mike had already talked about this, but there are no blueline tilefish in South America. They don't occur there, and so that third bullet under data updates, and the southern extreme of their distribution is the Western Campeche Banks.

MS. HOWINGTON: Anything else, other than changing South America to Mesoamerica?

DR. CROSSON: This convene a panel of several SSC representatives, you're not looking for that right now?

MS. HOWINGTON: No, and this is just the scopes of work, and we're going to be taking this to the council, because we still need to determine if red snapper changes. If that happens, then you will get official terms of reference and a schedule, and we'll go through the whole thing.

DR. CROSSON: You might want to keep the Mid-Atlantic Council in the loop for anything with blueline tilefish, and so I would put that down. If this were to come to be, then it should be that the Mid-Atlantic SSC will likely want to have a presence as well.

DR. SEDBERRY: Good point.

MS. HOWINGTON: Thank you, Scott.

DR. NESSLAGE: A quick question on snapper, and sorry to go backwards, but the beginning says to apply the current BAM configuration, but then there's obviously going to be a task to explore alternative selectivity curves, which would be a change in the configuration, and so, just to be clear, because there is confusion about what's going to happen with these operational

assessments going forward, would they just be sensitivity analyses, or could they be the final base run that would be used for management, because I think that needs to be clear and upfront to folks, and does that make sense, my question?

DR. SEDBERRY: Yes.

DR. ERRIGO: I think that terminology might be confusing, and the current BAM configuration doesn't mean the base run from the previous assessment. It means the way the -- It means the model code and how it is, because they make changes and updates, like using different distributions and things like that to do the estimation process and that kind of thing, and so that is what is meant by that, and, for the selectivity curves, yes, they definitely -- If we find that a different selectivity curve is more appropriate, then that should be used for the base run.

DR. SERCHUK: I just have a comment about updating the assessment terminal year. If this assessment is going to be completed -- In what year do we expect it to be completed? I am talking about vermilion snapper.

MS. HOWINGTON: That is still unknown, just because we need to go through the council process of potentially moving red snapper from the research track to operational, and then we'll be able to potentially integrate it in. We have -- Let me see on here. Yes, it's still just TBD for now, and you will be updated on any potential end date, and then the terminal year will potentially -- That's why it's 2020 versus 2021, and there's a slash in there, is because the terminal year will change, depending on when we can started on this, if we get started on this.

DR. SERCHUK: Right, and so, typically for these things, the terminal year is three years prior to finishing the assessment, correct?

MS. HOWINGTON: Not always.

DR. SERCHUK: Well, I am taking a look at your table here.

DR. ERRIGO: It's often one to two years, now.

DR. SERCHUK: Can we go up to the table? Terminal year of 2017, assessment to be completed in 2020, and that's three years, right, and so 2017 and 2020, 2017 and 2020.

MS. HOWINGTON: Okay, and so the first two are benchmarks, and then 59 and 60 were paused, due to the government shutdown and to the MRIP workshop, and so, normally, those would have been completed in this year, and so it would have only been the two-year gap.

DR. SERCHUK: Okay. Thank you.

MS. HOWINGTON: Any other questions or comments for vermilion snapper or for blueline tilefish? All right. Thank you very much. Sorry that took longer than I thought it would. My bad. Thank you for staying late.

DR. SEDBERRY: No, everything takes longer. Thank you. All right. I don't think that we need to add any more agenda items for today. I appreciate everybody's perseverance for this very long

day, and we got through a lot of stuff, and I appreciate all your input and cooperation, and we are recessed until tomorrow morning at 8:30.

(Whereupon, the meeting recessed on October 16, 2019.)

- - -

October 17, 2019

THURSDAY MORNING SESSION

- - -

The Scientific and Statistical Committee of the South Atlantic Fishery Management Council reconvened at the Crowne Plaza, North Charleston, South Carolina, on Thursday, October 17, 2019, and was called to order by Dr. George Sedberry.

DR. SEDBERRY: Good morning, everybody. Welcome back to day three of the fall SSC meeting. Overnight, Mike sent out an email with a link to the National SSC Report and some other documents, and we have hard copies, a limited number of hard copies, available of those reports on the back table here, if you're interested in taking a hard copy.

We still have a few agenda items to finish up this morning and early afternoon, and we should be able to get through that, but, before we start anything new, we have a few leftovers from the ABC discussion yesterday. If you recall, Mike was going to do some recalculation for some of the graphs, to show some fishery-independent indices and then what would happen if some of the things that we discussed were implemented, and so Mike is going to bring those up and talk about them.

ABC RECOMMENDATIONS FOR UNASSESSED STOCKS (CONT.)

DR. ERRIGO: We will start with almaco jack, and what I did was I calculated the ABC based on ORCS using the reference period of 1999 to 2007 and a moderate risk of overexploitation, and this red line is the ORCS ABC.

DR. SEDBERRY: Now, we've already made our decisions on those, our recommendations on this, and you had just plotted it so that we could see what it would look like.

DR. ERRIGO: Yes, and you guys had just asked to see it.

DR. SEDBERRY: That's what it looks like. Any questions? Then black grouper.

DR. ERRIGO: There was also knobbed porgy, where we used the same approach we used for scamp to calculate the ABC, and the purple line is the new ABC recalculated for knobbed porgy.

DR. NESSLAGE: Was the final range of PSEs, and I'm just curious, that you ended up using?

DR. ERRIGO: 33.8, 47.8, 89.9, and then the average was 57.2. Those are the last three years. These are the actual PSEs, and then this last one here is the average.

DR. SEDBERRY: Again, we already made our recommendations on this, but this is what it looks like. Thanks, Mike. Were there any other leftover ABC items?

DR. ERRIGO: Black grouper. There was one independent index for black grouper, and it was a reef fish visual census, and it -- Because it's fairly inshore, it only indexed sub-adults, but it did index black grouper, and it's this green line here, and this is the actual index with the uncertainty bounds and the median values and everything associated with them, but I thought you might want to see it plotted against the actual landings here, but it is sub-adults, and so it, in a given year, shouldn't really -- They were going to use it as a recruitment index, and so it really should give you an idea of what's happening a couple of years down the road.

DR. SCHARF: So there's no recent data beyond 2013 or so?

DR. ERRIGO: It goes to 2014, and that was the terminal year of the assessment.

REVIEW DRAFT MODERNIZING RECREATIONAL FISHERIES ACT REPORT TO CONGRESS

DR. SEDBERRY: Thanks, Mike, for doing that. Okay. I think we're ready to move on to our next agenda item, which is Number 6, the Review Draft of Modernizing the Recreational Fisheries Act Report to Congress. This was Attachment 9 in the briefing book, and, for this agenda item, I have Jerod and Church taking notes. Jared, what we want to do is capture any consensus statements or recommendations or conclusions that the SSC comes up with and any kind of rationale that might help support that statement and be included in the report.

The SSC has been provided an opportunity to review and comment on the Draft Modernizing Recreational Fisheries Act Report to Congress, and NOAA is seeking SSC, council, and commission review and feedback of the draft report, and so our action item here is to review and provide comments and recommendations on the draft report, and so we probably need a statement about this.

DR. GRIMES: I mean, are we at liberty to kind of edit this thing a bit?

DR. ERRIGO: You can make whatever recommendations you want. That doesn't mean that they have to take them.

DR. GRIMES: That they have to take them, right. Nor does the rest of the group have to take them either, but I read it, and I had some suggestions. I thought it could be more complete than it is in the introductory part of it. Like in the types of data part here, it makes no mention of the effort, and it doesn't talk about fisheries-dependent or fisheries-independent, and it doesn't mention demographics, for example age and growth and reproduction and stuff like that, and so, I mean, it's not very thorough, I didn't think. Then, in the catch paragraph, it seems like, if you're going to have a separate catch paragraph, you ought to have a separate effort one, or at least roll

effort into that catch paragraph. I mean, they don't even talk about fishing effort. Then probably describe the means, briefly, of collecting both commercial and recreational effort.

I thought the abundance paragraph was okay, I guess, and then, if you go on down, there's a biological one, and, I don't know, but it seems like genomics and genetics for addressing questions of stock structure and so on, but it doesn't mention other traditional methods of doing it, like mark-recapture and one of my favorites of chemical analyses, and, I mean, those have been important methods used to answer questions about stock structure.

Then ecosystems and socioeconomics, and I don't know, and maybe this is too much, but it seems like, for ecosystem stuff, it would be useful to add some reference to oceanographic issues on a basin scale, like multidecadal kind of phenomena that are critical to understanding environmental variability, and then analysis -- It seems like it ought to be made clear that most of it is conducted by NMFS, but it's also done by other people, states in particular, and I was thinking the FWRI does a fair number of ones for us, and I guess we did have one private one, the wreckfish, or whatever you call it, outside.

DR. SEDBERRY: Yes, you're right.

DR. GRIMES: I don't think that's mentioned in there, and it seems like that might be worth -- Anyway, that's my two cents' worth.

DR. SEDBERRY: Those are good suggestions, and I kind of got the impression that this is kind of a very superficial thing written for Congress.

DR. GRIMES: Yes, that occurred to me too, but we better not throw any insults at Congress, I guess.

DR. SEDBERRY: It's not getting into the weeds, and in some places it's not even getting into the grass, but it is like a ninety-thousand-foot view of what's done, but I think these suggestions that you have listed are -- They can certainly be included, assuming that the rest of the committee agrees. Any other suggestions or comments?

DR. ERRIGO: What was the one about multidecadal --

DR. GRIMES: Under ecosystem and socioeconomics, just a little bit about oceanography and these -- There are fewer on the west coast. Really, PDO and things like that have huge consequences for recruitment, for example.

DR. SEDBERRY: So multidecadal fluctuations in oceanographic --

DR. GRIMES: Yes, or something like that.

DR. NESSLAGE: Perhaps I am misunderstanding the whole reasoning for this document, and so correct me if I'm going off-base here, but there's a lot of language about incorporating outside data from either non-governmental organizations, and possibly state or citizen science, all these other potential data sources, and, in the recommendations section, it says for NMFS and councils -- Suggest to develop a clear process, which is great, for reviewing the new data prior to

incorporation of an assessment, which I highly -- I think that's great, but, above that, I guess it's talking about how the data need to be generated from sampling plans that cover the entire stock range, with relatively long time series, and the peer review and the sampling design, and I can see a number of the MRIP one-off studies that have been done by the states have been highly informative, and they're not across the entire range. They might be addressing a small, localized issue that is of importance to that fishery or that area, and I guess what I'm saying, and I'm not saying it well, is that I think this is a bit too restrictive.

If there are specific problems in specific areas, that can help a council, or a state, to get better estimates to manage their local or regional fisheries, it shouldn't be restricted to long-term entire-stock-range data series, and I do agree that it should be peer reviewed and follow a good sampling design, but it seems a bit restrictive to me, I guess.

DR. SEDBERRY: So there needs to be some way to address short-term and localized data needs for short-term and localized problems.

DR. BUCKEL: To that point, I had the same concern when I read through that, Genny, and I wasn't thinking of like that MRIP one-offs on the short-term. I was thinking of the long-term fishery-independent programs, and so like a lot of juvenile sampling programs with beach seines and small trawls in estuarine environments, and those have proven really useful for assessments, in combination, and so I guess just a -- It can be in the same bullet, but short and long-term, to handle some of those fishery-independent programs that, at the state level, don't cover the entire stock, but they're still informative.

DR. SEDBERRY: I'm thinking of some of the surveys that Florida does that have been useful for yellowtail snapper.

DR. DUMAS: I had two concerns down in the recommendations section. One was they talk about one recommendation is that perhaps SSCs could review the new data coming in, any new data from these state and non-governmental partners, which potentially is fine, but we would need to think about do we have enough time for that and what would that process be, and that would be an additional task that we would have to take on, and, also, they talked about identifying a liaison at the Science Centers to assist non-governmental entities and to also potentially develop communication and outreach efforts, and is that something that the Science Centers have time to do, or, if not, if this goes forward, do they need to ask for additional resources to cover something like this? Thanks.

DR. SEDBERRY: Thanks, Chris. I see where the document states that the SSCs do the peer reviews of the stock assessments and that those processes have mechanisms in place for incorporating new data into the assessments. When I read that, I kind of thought, well, this is not different from what we have been doing. We review the assessments after the data have been incorporated through the SEDAR process into those assessments, but I will look at the wording again and make sure that it does state that we directly review new data sources. I kind of didn't read it that way.

DR. CROSSON: They probably thought that this is something that we already do because the wording is so incredibly vague that --

DR. SEDBERRY: Yes, it is vague. You're right. When I read it, I said, oh, we're already doing that.

DR. DUMAS: Do we have the time to do that? Is that something that we would need to have additional resources for and that type of thing, and so just more to the management and the time implications of this document, and are they saying we are going to -- If this goes forward, do we need to do substantially more work, and, if so, is that something that we're prepared to do, or does everyone see this as just sort of business as usual and there would not be a significant increase in the amount of work and data coming from state and non-governmental organizations.

DR. SEDBERRY: Those are good points. We have to be on the lookout for things that add tasks or add work without adding resources to do it.

DR. BUCKEL: I am thinking about, currently, a lot of the NOAA funding programs require you to -- If you're an academic and you apply for those funds, you have to get a National Marine Fisheries Service partner, scientific partner, and that helps. They may say, hey, if you add this component to your study, the data will be more useful for assessments, and so they're kind of a gatekeeper, if you will, but then there's a lot of state-funded fisheries projects, and sometimes those are on federally-managed species, and it may be helpful to have some direction to those state fisheries programs, and that could even include state-level Sea Grants to -- If it's a federally-managed species, to have a requirement to have, similar to the federal RFPs, have a requirement to work with a federal fishery biologist, to ensure that the data -- Just as a second set of eyes to make sure the project is going to get the most bang-for-the-buck, in terms of data utility for a stock assessment.

DR. SEDBERRY: That would be something like incorporate NMFS partners into state monitoring programs that include monitoring of federally-managed species.

DR. BUCKEL: Not just monitoring, but federally -- Research projects on federally-managed fish species.

DR. SEDBERRY: Okay. Research and monitoring, or just research?

DR. BUCKEL: I think just research would cover it, because a lot of those are two to three-year studies or something like that.

DR. AHRENS: I think a good example of that is the document that Fred had sent around a number of days ago, where you had MRIP evaluating iAngler and iSnapper, in terms of whether or not it's best available scientific information, and, of course, they concluded that it's not, because it's not probability sampling, and so I think really supporting the notion of helping to design those programs initially, whether they are with state agencies or other individuals, so that that information can be incorporated into the stock assessment in some mechanism there, is important.

DR. BUCKEL: One thing I see a lot of are tagging studies, lots of state tagging studies, and the only useable data that ends up coming out of those are movement, where you tagged them and where they went, but, with some other auxiliary studies, like high-reward tags or double tagging, you can get at the tag loss rates and the tag reporting rates, and then you can estimate survival rates

from those programs, and so, with just a little additional cost and change to the design, you can get a lot more information that would have better utility for an assessment.

DR. SEDBERRY: Any other suggestions?

DR. DUMAS: One possibility would be I think they mentioned that state and non-governmental data collection programs could supplement existing programs, but one specific thing that we might want to comment on is recreational angler groups that are not targeted by the new APAIS and FES. For example, one thing that we identified at the MRIP workshop in August was anglers who live in coastal areas, but are not coastal citizens, or coastal residents, and so, for example, people who are renting cottages or things like that that are not -- Who are fishing from private docks or private areas that are not picked up by APAIS, but then they're also not surveyed in the FES, because the FES just focuses on resident anglers, and so non-residents who are coming down, for example, and renting beach cottages, or renting condos, and are going out fishing in private areas, and those are, we think, not captured by either of those sampling programs.

It's really identifying recreational user groups that might not be captured by those existing programs, and so that's an area where perhaps state and non-governmental organizations could really help out, and that's just an example of a way, but I think that could be an important example, because, in some places, those types of anglers could be a large proportion of the recreational anglers in those areas. Thanks.

DR. SEDBERRY: Thanks, Chris. This is to address some of the problems that we saw during the MRIP workshop and included in our report of areas that might be missed, and we made some recommendations on how to improve that, and this would be another good place to restate those recommendations.

DR. AHRENS: I think it's really important to reinforce though that those types of programs have to be able to integrate into the existing programs in a meaningful way, and so anything along those lines would -- You would need to work with MRIP to ensure that there is some compatibility in the data that would go in, and I think that's not trivial. Otherwise, that data will just be rejected as, well, we can't use this.

DR. SEDBERRY: So it would be important in this statement to say something about working with MRIP, to make sure it goes through the whole certification process. Any other suggestions? I think we have five or six up there, and do we want to read through them and make sure that the entire SSC agrees with what we're going to recommend? Jeff, did you have something else?

DR. BUCKEL: I am not sure if it's -- It seems like it's mainly research recommendations, but there is one bullet that had something with outreach, but that would be a -- I am just thinking about the new descender and venting requirement, and so something on the outreach to recreational anglers, and it always surprises me. Those tools have been around for decades now, and there are still folks that don't know about them, and so that's just one example, but I'm sure there will be others in the future where outreach to the anglers would be helpful for compliance for some of the management, and so, again, I'm not sure if that fits in this, but there was one bullet on outreach, but it was specific to --

DR. SEDBERRY: To science, I think.

DR. BUCKEL: Yes, and so I'm not sure what others think on that topic.

DR. SEDBERRY: Well, I think that, where recreational fishing is concerned, outreach is always important, and particularly when new technologies and new methods are being developed and we want the fishermen to incorporate it into what they're doing.

DR. AHRENS: I think it would be nice to have some language in terms of evaluating the efficacy of the outreach as well, that it needs to be done, but it also needs to be evaluated.

DR. SEDBERRY: So outreach efforts and evaluation of outreach efforts. Maybe we can put it all in one bullet. Okay. Anything else? Everybody just read through these real quickly and make sure that -- These came from individuals, and we just want to make sure that the SSC agrees that these are all good recommendations.

DR. ERRIGO: The SSC can flesh these out, or wordsmith them, when writing the report, and these are just like no-form bullets, unless something is wrong, and then let me know, and I will correct it.

DR. SHAROV: I personally had some hesitation with this document. On one hand, everything that it describes is appropriate, and what's what we would have said, but I had a little bit of a feeling that it just has a sense of like how great we are, collectively, in doing everything, and it just leaves a feeling that nothing could be done any better, and it just -- Particularly, there is some wording that is just excellent and outstanding, et cetera, et cetera, and so I will leave this to the others, and maybe some of us agree with that.

These are very general sort of reports, and I was wondering, specifically on the MRIP, the recreational data that we are so concerned about, is it possible that we would add a sentence or two about the urgent need for the validation of the effort estimates, because we have the methodology that has changed, and it went through the peer review process correctly, but there is still no validation that's been done on any significant scale.

I understand that this is a substantial challenge, scientific challenge, but, unless that validation is done, maybe starting with the small projects and then expanding, this important issue that hangs us over us, and it causes heartburn to everybody, will remain. It will stay there, because we cannot state with confidence that the estimates that we are receiving are unbiased. They are unbiased by the design and the way that the data have been collected, according to the design, and yet these are -- This is still an estimate that requires a true validation, and I think that that would be helpful. Again, sorry for not being concise, but I hope you got the idea of what I was suggesting.

DR. SERCHUK: With all due respect to my colleague, this is a report to Congress, and we had an MRIP session here. If we have specific concerns with MRIP as an SSC or as a council, they ought to be directed to the people in charge of the MRIP program, and I'm sure this must have come up during the workshop.

The MRIP program realizes that there are lots of things that need more scrutiny, and perhaps more validation, and so, while I agree, in terms of what you're saying, Alexei, this is not the place to bring up this type of thing, in my mind, and it certainly needs to be raised to the people that were

here in August and who are running the program, and maybe it was. I was not here in person, and so I can't vouch for what the dialogue was, but I know that we had concerns before the workshop, and, if they still linger, then we still need to reacquaint the people that are in charge of the programs with our concerns. Thank you.

DR. SEDBERRY: I agree with both of you, that there are problems that need to be pointed out, and that we have done that through other channels, which are probably the best channels, and I think, if we focus in on -- If we take the paragraph here on catch and effort and try and stick that in here, then the next paragraph is on abundance, and the next paragraph is on biology, and all of those paragraphs are missing very important things, and so, once we start down that route, we need to -- I feel like we need to fix it all, and I don't think that's the purpose of this document, is to go into great detail about what is done, but just we're doing this. We are measuring catch, and we're measuring effort, and we're measuring age and growth and reproduction. There is issues with all of those things, which this document does not mention.

DR. SHAROV: Thank you, and I appreciate that, and so that's why I asked is there a chance and is this the place where we could do this, and apparently the format and intention of this document is different, and so I, as so often, am being way too straightforward in what I want.

DR. SEDBERRY: But I appreciate your concerns and your suggestions, and I think they are good, but just this is probably not the place to do it. All right. I think we're good with this. Okay. Next agenda item. We need take public comment on the draft report to Congress, and is there any public comment? I do not see any. Then we'll move on to Agenda Item Number 10, the South Atlantic Ecosystem Model Update, and I have Chris and Amy as notetakers on this, and there were three attachments, and there's a presentation. The presentation was not in the briefing book, but we're going to get that presentation. Roger is going to introduce --

SOUTH ATLANTIC ECOSYSTEM MODEL UPDATE

MR. PUGLIESE: Actually, the original presentation is in there, and there are some updates that may have been distributed, some fine-tunes that you all should probably -- Just make sure we did that, but I just wanted to do a quick intro of our presenters today. This is a follow-up from the last meeting, where we had the really comprehensive review of the model and initiating of the creation of the review group and initiating the process to begin to even fine-tune and set a path forward for adjustments, and what that involved was a first meeting of a model review and the opportunity to look at how to move this into the future on two points.

One was on the opportunity to refine and update diet information, basically providing some guidance into the future on not only model development, but also on how to effectively use the capabilities of the model to guide research and collection of new information to further support this, and so that's going to be one of the updates from Lauren Gentry, the first one on the ecosystem model diet update.

Again, it represents probably the most comprehensive diet information that's been ever compiled in an Ecopath model in the world, and so we're moving into some really good grounds and hopefully supporting capabilities that the SSC can advance. The second presentation is the second part of the working meeting, and that was to look at the other aspect that really will provide some

capabilities and tools into the future as development of Ecospace for the Ecopath with Ecosim model, and Luke McEachron, who was involved in developing the Ecopath model and then an Ecospace model for the Florida Keys National Marine Sanctuary, and he highlighted that at the last SSC, will be providing some input on the first investigation of advancing and taking advantage of a lot of what we've been building through the council, our web services and capabilities on spatial information and compiling that information and how we could look to that or other aspects of environmental information that would guide development of a fully-operational Ecospace model into the future, and so we wanted to get this to the SSC to see that this is advancing.

Members of the appointed review group attended, and they provided pretty significant input on how to move forward, and I think some of the initial investigation will be interesting, on the inputs from both Lauren and Luke, and the key is that these members are a model team, and we had talked in the past about having a point man or an individual, and we have a team that's going to really foster this in the future, and our partners with FWRI are a core group that is going to both provide this information into a long-term sustainable system and Ecospecies and capabilities of advancing the model efforts.

I just wanted to give a quick intro and status and kind of next steps, and the review starts about a month after this, once we get the final tweaking of the balance model ready, and so, with that, I think I will bring Lauren in, and, as I mentioned, Lauren is also involved in the development of our online Ecospecies information system that this information is also going to be integrated into, and so we have some really nice crosswalks with the efforts that are ongoing, and she even participated in the recent climate vulnerability workshop that I knew would be excellent, because of all the connections to all of the species information that we're working on, and so we're trying to make all this be as effective and useful and build on our partner cooperation, which this modeling effort has really been, and so, with that, let me cut myself off and bring Lauren up.

DR. SEDBERRY: Thanks, Roger, and the workgroup that -- The review workgroup that Roger mentioned has several SSC members, including Marcel, Fred Scharf, Alexei, Rob, and Eric, and Luiz Barbieri was also on that workgroup, and so we need to do something about that. Welcome, Lauren.

MS. GENTRY: I am Lauren Gentry, and I'm with the Fish and Wildlife Research Institute, and, for about a year now, I have been charged with polishing up the South Atlantic Region Ecosystem Model, and so I'm just here today to tell you about the work that I have been doing in polishing up the diet data and the process of how that works, and most of this is going to just be walking you through the process, the value in the process, what can be gleaned from that process, and then also some of the updates and outcomes of that workgroup meeting from July.

Just to give you an update of the upgrades that have been made since you saw this back in April, we have gone from having diets for about sixty species, representing forty groups, to now having diets for 223 species, representing 112 groups, and we'll go into what those groups are in just a little bit.

Back in April, there were species proxies, and so saying these two species are very similar, and so we're just going to use the same diet for them, and we've completely gotten rid of that, and none of that is done anymore, and we were using data from the West Florida Shelf model for about fifty groups, and now we only have that left over for seventeen groups, and those are all invertebrates,

because, essentially, what a lobster eats is what a lobster eats, whether it's on the west coast or the east coast. Back in April, there were about twenty groups that we had to just fill in some best guesses, and I have been able to fill all of that in with actual published information.

All of the shuffling that happened, through getting all of those diets, we have ended up with 140 groups, representing about 670 species in the South Atlantic region, and we've got our photosynthetic groups, our invertebrate groups, and you can see that those are a handful of single-species groups, like blue crab or spiny lobster, a few habitat-based groups, like offshore polychaetes or inshore other things, and mostly it's taxon-based groups, like all squids, and then we have a few catch-all sized-based groups, like mega-invertebrates or small epifauna, and it's similar for the vertebrate groups, too.

We've got taxon, species, habitat, and trophic association-based groupings, plus your four dead things at the bottom, and that gives us 140. For anybody who is strictly interested in what exactly 140 groups are, that's all listed in the appendices at the end of the slides, if you want to click through to that at some point.

Just to show you how those 102 vertebrate groups are broken down, if you are a non-fish, then you're probably in a higher taxon-based group, like all raptors or all baleen whales are together, and then, if there is a managed species, it's most likely in a single-species group, and there are a few exceptions to that, and everything else is in either a taxonomy, habitat kind of consortium there, like all of your mid-shelf snapper, and then we have some higher-taxon-based groups, and then everything else that doesn't fit in one of those other groups falls into one of these twelve trophic-related groupings, like all highly-migratory pelagics.

First and foremost, try not to pay attention to any of the numbers on this slide or the next one, and these are just examples for illustrative purposes, and we don't want to get lost in all of that, and so, just to show you the method of how this diet is put together, for every species, I collect stomach content information from large databases, like the FWRI Gut Lab, SEAMAP, NOAA, et cetera, and mostly from published literature, like is shown up there, and, if all else fails, I pull lists of diet items from field guides and textbooks and memoirs and things of that nature.

If the information is in, preferably, percent weight or percent volume, I transfer all of the prey items over into an Excel file, as you can see there, and I, one-by-one, decide which of our 140 groups that prey item belongs to specifically, and so Anthozoa goes encrusting fauna, and so I go through all of the prey items and decide which of our groups they belong to.

Then, once I add all of those percentages together for each of our groups, you end up with a final diet. Once again, please don't pay attention to the numbers. Of this group, or this list, it represents all of the animal's diet and in what proportion, and so what groups are represented in this predator's diet and in what proportion. For groups with multiple species, something like highly-migratory pelagics altogether, or for species for which I have multiple diets for, we simply average that together for a final group-wide diet, and then all of these diets go into a large matrix, which I am not going to show you here today, because I would like to think that you can all imagine a huge table with 140 rows and 140 columns and a whole bunch of numbers in between that is the matrix, and that is the end product of this diet information.

At the end of doing each of these diets, I also started keeping track of a few categories for the sake of metadata down there at the bottom, and so the categories I came up with were sample size, how many stomachs were sampled for this data, the year that it was published, how many items were actually in the animal's diet at the end, and each category can get a score from zero to six, and that's just how I did it, and the average helps me keep track of generally how strong or confident a species diet is. If you're curious as to how those scoring details work, that is also in the appendix.

Lastly, you see that final little row down there at the end, or final column, and I keep track of anything ecological or otherwise that sticks out to me. If something is an ecosystem engineer, if it's an invasive species, if it's especially delicious and important locally, then I will put a little note there to keep track of any possible trends, and so, at the end, some of the things that you will see are the trends that were pulled out from there.

Then, with all of this metadata, what we're able to do, and we'll continue to do as this diet matrix grows, are to make these lists, essentially, and so what you see here are just the three species that ended up in the bottom rung of each of those metadata categories, and so anchovies, Nassau grouper, and ocean triggerfish all scored a zero for sample size, because, for all of those, I have less than ten individuals sampled or their stomach content information.

The three that you see up here are just three that I pulled out of the list, and they're not necessarily the only three that are in each of those bottom rungs, but the important part is that I can see what predators are data poor and why, and specifically why, they are data poor, rather than just saying, oh, I didn't like that study, and I can't really tell you why, and, most importantly, from this list, or these set of lists, if I want to combine them, then I can end up with what you might call the worst of the worst list. I can see what animals ended up in the bottom rung in multiple metadata categories, and this gives you a really good cumulatively data-poor list. This list was significantly larger at the July working group meeting, but we're actually down to these four, which is quite pleasant.

This list is what I would consider the start of either talking about future research needs, talking about future connections that need to be made of somebody goes, oh, actually, I know somebody that has done that research, or something along those lines, and it starts getting us towards the value of doing this process, which is finding out what diet information is out there and what maybe is out there, but not readily accessible and needs to be made readily accessible.

Off to the side there, when I was doing the -- As I do this and I go through, I also make a small handful list of kind of a personal wish list, and those are predators that I felt were bit well represented as predators, but were not necessarily sticking out in the metadata. They didn't have anything specific about them, but something seemed a little bit off, maybe something that I didn't have a metric for, or something that ended up in one of those ecological columns, where I just kind of wrote out to the side that, no, this is too important to go there, and so this method really lets me track data gaps and see what species need more attention or more research in the future.

Moving away from that, one of the other abilities that we have as we go through this diet matrix process is the built-in sensitivity analysis in the program that this model is built for, and it's called Ecopath with Ecosim, and this function is a Monte Carlo routine that works towards reducing the sum of squares by adjusting individual diet proportions in the matrix up and down, to see which one gives you the least sum of squares.

Every time you do this, the first results that come back are a little bit disconcerting, because it will show you that the group that had the most adjustments might be the group that actually has the best diet data, but, of course, if I correlate that -- If I look at that in comparison to my diet richness score, there is a 40 percent correlation there, because, of course, predators with more diet items have more items to be adjusted, and so, even if each of their diet items is only adjusted a quarter of a percent, you add that all together, and it looks like your diet was wrong.

Once you take out those correlating groups, you end up with results that -- The last time that I ran this, it fortunately validated the list that I already had on the last slide, which was very nice, and the results ended up segregating into the sections of species here, and so the top section is species that we already knew that I don't have enough data for, and it's simply not out there, or I just haven't found it yet, and more research needs to be done into looking for the diets, or else just maybe the diets don't exist, and the middle section are species that have such a big impact as a predator that their prey -- That they need more detail in their prey, and so, even though pelagic sharks might have fifty diet items, when I average them all together, they probably need more than fifty diet items, because they are so important as a predator on the system.

Those last two at the bottom were species that lean too far on just a few diet items, and this is where we start getting into the interesting part, and so I looked into each of those, and I was trying to figure out why red drum had been adjusted so far, and I found that my red drum stomachs, the study that I was using, those stomachs were collected in Chesapeake Bay during a blue crab bonanza, and so that study said that 50 percent, I think, of their diet was blue crab. Obviously, that's not what they are eating on a day-to-day basis, and so I looked into -- I got more red drum information from our FWRI Gut Lab, and it was like 8 percent blue crab, once I averaged it all together, and then that problem was fixed.

This can let me go in and find some of these individual issues that are in the data that are skewing things, and demersal coastal invertivores, those are like your pigfish and catfish, and they eat a lot of invertebrates, and the model wanted to adjust that, and I'm not going to adjust that. They are invertivores, and so of course they eat invertebrates, and so at least we know now that this function can alert us to issues when there are issues, and that it's identifying the same problems and the same data needs that I was identifying before too, and then it can also just point out things that say that demersal coastal invertivores eat a lot of invertebrates, and I say, okay, that's fine, and then let's move on.

The final function of this ability of the sensitivity analysis is the adjustment matrix that it gives back to me. It lets me go in and isolate the specific interactions that the analysis wishes to change, and I say wishes to change, but that's to reduce the sum of squares, and the biggest adjustments at the top there made absolute sense. It wants snappers to eat more squid and for Syngnathids to eat more arthropods, and I'm fine with that. That is perfectly biologically relevant.

Then it also identified some interesting interactions that warranted a closer look, and so, as it turns out, once I really got down into the data to figure out what these specific interactions were that were being changed, halfbeaks do not eat 10 percent seagrass. That was incidental ingestion in one study, and so I got to take that out. Hogfish do not eat 70 percent echinoderms and gastropods. That was a low sample size issue, and I found some more data, and that is not actually what they eat all the time.

Do red snapper eat 40 percent tomtate? It wanted to reduce that, and, once I added more red snapper information from Jessica McCawley, who is not here right now, that turned out to actually not be a real issue. They do eat a lot of tomtate, but not 40 percent.

Now coastal bottlenose preying on weakfish, it said that 30 percent of their diet is weakfish, and that's going to take a little more time for me to look into, and I need to talk to some dolphin people, but, from what I know, bottlenose do in fact select quite heavily for any kind of drum or sound-making fish in murky water, and so, even though the model says, to reduce the sum of squares, you need to reduce the reliance of bottlenose dolphin on weakfish, we may end up leaving that one where it is, because that may actually be biologically valid.

At this point, in the July workgroup meeting, and it was a very similar presentation, and we looked through a big long list of data-deficient species that were discussed earlier, and we talked about how or if it's even possible to get some data for them, and these were the outcomes that I am reporting to you all here today. A few of your rarely-encountered grouper and snapper from yesterday, like black grouper, we determined that we're just not going to get diet information from them anytime soon, and so they were grouped together with a larger group, and so black grouper went into other-shallow grouper, and banded rudderfish were put in with the other jacks, and they no longer have their own species-specific group inside the model anymore.

Then the workgroup was able to pool our collective knowledge to create a list of contacts for a few of those specialty groups, like invertebrates and manatees and tarpon, and herring were pulled out of their trophic group. They had been located in pelagic planktivores, but it was determined that they are so important that they were given their own group, and, finally, we just noticed that queen triggerfish had somehow been left out, and so they were added as a group.

A side note is bullet and frigate mackerel were pulled out and given their own group earlier in the year, and I think somebody, in just a little while, is actually talking about bullet and frigate mackerel, and so that was why I pulled those out. I saw that that was a review that was coming up and a discussion that was happening, and so bullet and frigate mackerel also have their own separate group inside this model, too. All of this adding and subtracting and rearranging is how we ended up with our current 140 groups.

Now that you have seen how it all works, I wanted to show you the value in the process outside of just the model itself and the accuracy of the results, because, while it's very important and that's why we're building this diet matrix, there has been, and will continue to be, value in the process of building and refining this matrix, and so members here who attended the NOAA climate vulnerability workshop earlier last month will attest to the utility of having all of this information in a relatively quick-to-access format during those discussions that came up a number of times.

I am also the coordinator of the SAFMC Ecospecies database, if you guys remember that one, and so, obviously, all of this data is going to end up getting put into those species profiles, and that will be available for managers and the public and the media and anyone else to use, and the matrix itself can also be used as a standalone by anyone looking for a comprehensive prey list for a particular species, because I will have already done all of the work of going through all the literature and putting every known prey item into this matrix, and so someone else doesn't have to

do it in the future, if they just want to know what all those red snapper consume in the South Atlantic.

Another benefit is that once this matrix -- Once the matrix effort has essentially expired all readily-available data sources, we'll have a good list of future research recommendations for filling in those data gaps, and I have added two examples here, but likely we'll want to put extensive time into making sure that it's not already in the literature somewhere before we make any official recommendations or ask somebody's grad student to actually start cutting open fish, but, even during the meeting in July, Marcel said, hey, SEAMAP gets banded rudderfish, and we don't usually sample their stomachs, but we'll start cutting them out and looking at them, since we had no banded rudderfish data, and so we've already got the ball rolling on a couple of those data gaps being filled in.

Finally, this process, most interestingly to me, highlights particular pairs of predator and prey interactions that could be important to spend real time looking into. These are just a few of the examples that have really jumped out to me or things that have been previously discussed in these meetings.

It looks like shortfin makos may actually consume 80 percent bluefish on the east coast, and that's 500 individuals sampled over forty years, and so, next time we're talking about bluefish and their value as a prey species, it might be good to bring up that there might be some reliance there on bluefish. You all know about the marlin and the Auxis mackerels, and those are your bullet and frigate mackerels, and then there seems to be this overarching question that everyone wants to know of do red snapper really eat that much black sea bass.

The only red snapper data that I have from the east coast actually does have them eating 25 percent black sea bass, and the problem is that was only 200 individuals, and I don't know if they were sampled all at the same time, just after a black sea bass buffet event, and so I need to start finding more red snapper data from red snapper collected in areas that overlap the population of black sea bass.

It does me no good to look at red snapper data from the southern Gulf of Mexico, because there are no black sea bass there, but a lot of the other red snapper diets that I have found only have them eating 2 to 3 percent other serranids, and so who knows? We will just need to find more information about that, but at least the preliminary information that I've got from NOAA does say 25 percent sea bass, and so we'll just have to buckle up and see where that goes as we find more of that stomach information.

Finally, our next steps going forward, just to keep everybody in the loop here, we're going to fill in more of these gaps in the data, and that's ongoing, and the idea of this is going to be something of a living project that we can continue adding and updating the diet data even during the review and finalization process of this model, and so, every time something new gets published, every time someone else sends me diet information, or they find grey literature or something like that, that can be added, and so this could, in theory, never have an endpoint. You could spend a lifetime doing this.

We need to do a little quality control on the estimates at the beginning, and we'll look into the biomass and the discard mortality and make sure that those are all valid, and then, after a very

interesting balancing process, that essentially wraps up the Ecopath portion of this model. Then, moving into Ecosim, which is the time portion of Ecopath with Ecosim, there is a process for determining predator-prey vulnerabilities, but the idea is that you can specify the vulnerability of every prey to every predator.

Then we need to some quality control on the time series. We've got to go back in and figure out whether the time series that are in there were collected before or after all of these MRIP recalibration things that we have all had fun talking about all week long, and then that will finish up the Ecosim portion of it, and we'll make sure that those numbers are all still valid and good and to the best of our abilities, and then, after that, we start going into the spatial portion of the program, which is what Luke is going to talk about just after me.

Before we actually start taking questions, I just want to show you guys the appendices down here, and we have 140 groups, for anyone that really wants to look at what my 140 groups are, and we have those metadata categories and how the scoring happens, if anybody wants to look through that, and, most importantly, I have one more little wish list, if you will. If anybody wants to take this home, and you look at it and you say, actually, I do know somebody who is an expert in this, or I've got that paper on my computer all ready, then go ahead and send those my way, if you find that information or have an expert who would have that kind of information.

Thank you all so much for your time today, and I hope this was interesting to you guys, and, most importantly, I hope you all now feel comfortable flooding my inbox with diet data. Nothing would make me happier. All right, guys. Any questions?

DR. SEDBERRY: Thanks, Lauren. Are there any questions from the committee?

DR. LANEY: Thanks, Lauren. That was a great presentation. One question that occurs to me, and I think you touched on it, is diets can vary through time, obviously, as the composition of biological communities changes, and is that something that you can pull out from your database? I presume you are tracking the temporal currents or the temporal collection of diet data, and so if, for example, we wanted to know if -- Again, I realize it's going to depend on how much data you have in the system, but if we wanted to know how, to just randomly pick a species, red snapper diets on the east coast have changed over the last twenty or thirty years, and, obviously, it depends on your ability to find the data from that whole period of time to plug into the system, and so do you have a feel for how many species you might be able to do that sort of analysis for?

MS. GENTRY: As far as I know, the model program itself does not have the ability to change the diets based on temporal activity. On the other hand, since I am tracking the year that the diet was published, or that the stomachs were collected, if those are two different numbers, I can look into my own metadata and pull that out, and analyses can be run not necessarily in Ecopath, but they could be run in another program, in R or something like that, but, for the purpose of the model, I do average those altogether, because, once you start getting into I only want data from these years, or you start getting into spring versus winter diets, you severely reduce your sample sizes, and so the idea of the model diet data is to capture every possible prey item, and so what all theoretically could this animal eat, and then the model is allowed to adjust those diets up and down to balance out the biomass and the estimates and everything, but I am tracking that metadata of the years that the diet was made, and so that's all easy to track that way.

DR. LANEY: Part of my reason for asking the question, and Alexei and some of the rest of us around the table can relate to it, is when you have discussions about localized depletion, for example, in Chesapeake Bay with respect to menhaden and striped bass, and sometimes it's of interest for other fishery policy discussions or management discussions, if you are able to provide some insight into how diets may have changed through time.

I had one other question too, and I think you and I may have discussed this just a little bit previously, but, for the different life stages for each one of the species in your group, are you trying to segment those out, or do you just put all the life stages of black grouper, for example -- Are those all in the same guild or group in the model, and does that reflect the ontogenetic shifts in diet for a given species?

MS. GENTRY: For 138 groups, it does. King mackerel and Spanish mackerel have been separated out between juveniles and adults, because their diet shift is so drastic, and they were being tracked differently. That decision was made at some point to separate those out. For everything else, the diet is always averaged together, but, for fish that either I know of or someone tells me that there's a large shift between juveniles and adults, I will go in and try to find what the juveniles eat and add that as say 5 or 10 percent of the diet is what the juveniles eat, and then everything else is what the adults feed on.

DR. SCHARF: Just a comment, and then maybe to follow-up on what Wilson was asking, and so we have some new data that was just accepted for large pelagics in the South Atlantic, and it's pretty comprehensive coverage across the Carolinas, and there are sample sizes in the hundreds for dolphinfish, yellowfin tuna, blackfin tuna, and wahoo that we can provide to you, because I think it might -- What we found is that, while they share lots of similarities, there are certain aspects of their diet that create some niche separation that might inform -- I noticed they are all in a guild in here, and so you had sort of a highly-migratory pelagics guild, and I'm assuming they're in that guild, and they may be able to be separated into different species based on diet composition and the extent of piscivory and some other things that we found, and so I can send that to you later, tomorrow or today.

I was going to ask you too about the ontogenetic shifts, and I guess, if the model is focused on sort of federal waters, most of the ontogenetic shifts are sort of happening early in the life, in the juvenile and sub-adults, when they are in coastal and state waters, and so I just wonder if there is a need to incorporate that, or are you kind of focused mostly on the interactions that are happening in federal waters?

MS. GENTRY: First, to your highly-migratory pelagics, dolphinfish have their own group. Wahoo are in one of the pelagic coastal piscivores groups, and then the marlins and swordfish are what make up the highly-migratory pelagics, but dolphinfish do have their own group, and I would love more diet data for them, because I know they eat more than what I have.

For the ontogenetic shifts, I believe that this model actually includes shoreline out to 200 miles, and so it does include estuaries. We have estuary species in here, and we have a few groups that are specified as estuarine, polychaetes and things like that, and so we are actually including those nursery grounds in the model, and so that's one of the reasons that I like to include the juveniles and young-of-the-year and whatnot in those.

DR. LI: Just a follow-up, and, given that we talk about juvenile versus adult and the temporal changes over decades, is it possible for the model to separate groups that -- You have the data, and so it is possible that you can separate the model for juveniles and have one model for juveniles and one model for adults, and so, when you make the conclusion inference, just focus on that group of animals, instead of lumping them together, and I'm not sure if the model can do that, or would that affect the next model, the Ecosim part, because you are talking about the whole ecosystem as a whole?

MS. GENTRY: I think that that would actually require building a separate model with just that data in it, but, as far as diet data goes, it's already there, but you would still need biomass and production and growth estimates and everything for just that temporal range that you want to look at, and so that would be sort of a branch model that could be built.

DR. LI: I have a naïve question. So far, given the presentation, which is great, and, so far, is this the Ecopath model already and not the preparation of the data before they are input into the model? Is this the model already?

MS. GENTRY: The model does already exist.

DR. LI: The stuff you presented to us is already the model?

MS. GENTRY: No. What I am presenting to you is just the diet information.

DR. LI: But that information is going to be input?

MS. GENTRY: Yes.

DR. LI: Okay, and so it's not even Ecopath yet.

MS. GENTRY: No. That does exist, but this methodology was simply just how the diet has been done, kind of behind the scenes.

DR. LI: Okay. Great. When I look at your slides, Number 18, the category and the scores, I am wondering -- Those scores, like zero to six, did you use those scores to calculate something, or it's just a label to make them into different categories?

MS. GENTRY: Within the model, and I totally forgot to mention this, but, within the model, you can tell it a hierarchy of how much you trust your diet information, and that informs how much it will adjust that diet to try to fit and balance your biomass and everything else, and so, if it ends up with zeroes across-the-board for me, then I will tell it -- That's where the zero through six comes from, and so I can feed it that final average, and it puts that into how much it changes and adjusts the diet.

DR. LI: Okay, which means those numbers have meaning, have ranking, and it's not just a label, and so I am wondering about the rationale behind you ranking the year, and I noticed that early years were ranked lower.

MS. GENTRY: The model is actually for 1995 to 1998, and those are the years specified for the Ecopath model, and then it predicts forward to modern day and then past, and so you always build them for the past, and so this -- The six, the ranked six, the 1995 to 1998, are the years that are actually specified in the model.

DR. LI: Okay. I am just thinking of the rationale, and I can understand for sample size that is smaller and lower, less trustable, less reliable, for the year, and like early years of data doesn't mean it's less reliable or less trustable, but you ranked them lower, and also for the location here. The location is -- Like some locations are higher and some locations are lower, because --

MS. GENTRY: Because of proximity to the study area. If it's in the South Atlantic region, then it's in the South Atlantic region, and that's the area that we're mapping and looking at. If it's the South Atlantic region plus a little bit outside, then you're getting a little bit further, and so they might be eating things that don't actually exist in the South Atlantic region, and then, moving out from there, the Gulf of Mexico and the North Atlantic, that's a little bit further away, and then elsewhere in the Atlantic, and so it's essentially almost a concentric ring away from what we're looking at for this model.

DR. LI: Okay. I need some time to think about that.

MS. GENTRY: Yes. I need to draw out a map, I think.

DR. GRIMES: I had a question about golden tilefish. I gather you had sort of issues with finding very much, and it's less than ten fish, and is that just in the South Atlantic Bight? The comment I was going to make, and there may be other species like that in southern New England and the Mid-Atlantic area, where there is more diet data, and the environment, the habitat, that they are in is very similar, and they probably eat the same thing there that they eat in the South Atlantic, and maybe there's some other things like that, too.

MS. GENTRY: Do you know where that data is? Definitely send it my way, because I haven't been able to find it.

DR. GRIMES: It's sort of -- That's in the deep, dark recesses of --

DR. AHRENS: Just for some clarification, it's important to remember that the Ecopath model based reference years, the time period that you're building it for -- When you're using the diet matrix production per unit biomass and consumption per unit biomass, that sets up the baseline mortality matrix, right, for that year, and so, as your diets diverge away from that year, you're going to say, well, they are less likely to represent the actual mortality interactions that were occurring within that reference year, and so that's why it's getting weighted away from that reference year.

To answer the changing diet, once you move into Ecosim, the diet and the changes in diet are an emergent property of the model, and you can actually pull that changing diet out of the model and compare it to known changes that have been observed over that period of time, and what you can't yet do is fit to changes in diet.

That has been discussed, but it has yet to be implemented, and so the next step that they're talking about, once you've set up that kind of baseline snapshot, is tuning it to time series data, to try and say how have those mortalities potentially changed over time, and so what is the relationship between that prey and that predator and how that mortality pattern changes, and is it linear, or is it -- So that's the Ecosim component to it. As you move up into Ecospace, all of that gets spatialized, in terms of habitat preferences and such, and so, for an individual location or cell that you are modeling within Ecospace, that now has a diet matrix for everything that exists within that cell as well, and that emerges as well.

DR. LI: Thank you, Rob. That answers my question.

DR. SEDBERRY: Okay. We have another presentation on this, but one quick question, Wilson.

DR. LANEY: Just one quick follow-up, which I forgot to ask Lauren earlier. Do you have a target number of samples that you would like to have for every species in the matrix that you are shooting for?

MS. GENTRY: 2,000 plus, and six, the best rank, and so that's what I like the most, and those numbers were decided kind of based on the distribution of what I already had. I had a handful that had more than 2,000 stomachs, and then everything else sort of naturally fell into those other categories.

DR. LANEY: I will look in the basement archives and see how many more papers I can pull out, and I have a bunch of them, going back to grad school days, and John knows me well. I never throw anything away, and it's down there, and I know that I have a lot of striped bass diet information that I haven't sent to you yet, and I think I covered the sturgeon info pretty well, but I have still got a lot of striped bass stuff.

DR. BUCKEL: Just to this point about the 2,000 plus, the spatial coverage, to me -- I would rather have 100 from a bunch of different locations than just 2,000 from one location, and so I just wanted to make that point, as you're building -- If you have a choice of what you decide on, the spatial coverage throughout the South Atlantic would be more important than just sample size. Then, on the bottlenose dolphin and weakfish, I have recent data on that, and so we can talk about that, but it confirmed that weakfish are a dominant part of the bottlenose dolphin diet, at least off of North Carolina.

DR. SEDBERRY: I would like to, at this point, take a ten-minute biological break and checkout time, and so check out, if you haven't checked out, and then we'll meet back here at ten after and have the rest of the Ecopath/Ecosim modeling agenda.

MR. PUGLIESE: Just as a final note, as Lauren is heading out, one thing that came up is I'm curious about some of the more rare species, and I don't know how many had the chance to watch some of the online streaming of the Okeanos research that had been ongoing, but the one episode where the wreckfish came in and ate the spiny dogfish, and I immediately went to Lauren and wondered if we actually had it, and it is captured with I think some of the work that George actually did in identifying spiny dogfish as prey to wreckfish, and so there is a nice visual representation.

(Whereupon, a recess was taken.)

DR. SEDBERRY: Thank you for being so prompt. Continuing on with Agenda Item 10, the South Atlantic Ecosystem Model Update, we have the second presentation by Luke McEachron of FWRI, who is going to present on the information supporting development of Ecospace, and this is an update from the presentation that he gave at our spring meeting, I believe it was. Take it away, Luke.

MR. MCEACHRON: Thanks for having me. Much in the way that Lauren is working on diet information, and that feeds into an ultimate Ecopath Ecosim model, there are things we can do in Ecospace before there is actually a balanced model, and so I'll talk about what we're doing in that regard, and I will give you a little background on how Ecospace works, just as an update, because we haven't talked about this since March, and I will go through what we did in our July meeting with the Ecopath standing team.

You will recall that we have these three components in this model suite, and we have Ecopath, Ecosim, and Ecospace, and we're looking at a snapshot in time in Ecopath, and then we fit those dynamics over time in Ecosim, using time series, and then, in Ecospace, we're looking at those dynamics over space and time. The key thing we are focused on now in Ecospace is identifying these habitat capacity functions, and so, if you look at this graph here, we have a habitat capacity value ranging from zero to one on the Y-axis, and, in this example, there is a temperature on the X-axis, and so that histogram are the map values in a raster layer that are set to the extent of the South Atlantic region.

What we want to focus on is fitting that black line, and so that black line determines how -- It determines a prey vulnerability density, and so the idea is that, as that black line approaches zero, given a map value, the prey are restricted into smaller foraging arenas, so that predation gets concentrated into smaller and smaller areas, and the prey get eaten very quickly in those areas as the predator biomass increases.

The bottom line is, if that black lines goes to zero, the map is not really going to predict any biomass, or very low biomass, given whatever those map values are, and so, in this case, a temperature above twenty-nine degrees, you would expect there to be less biomass predicted in a spatially-explicit way, and we can add basically any raster product of ecological importance to define these habitat capacity functions, and that's really what we wanted to focus on, is what are the known environmental relationships that we think are driving the spatial distribution and these foraging arena interactions and what data are available and what resolutions are available, so that's what we focused on in July.

There's a few papers out there that list a ton of variables that people have used in this type of modeling, not necessarily Ecospace, but distribution modeling in a marine environment for fish and other marine animals, and there were seventy possible environmental covariates, and several of them are correlated with each other, and that's what this graph is. It's just a correlation matrix for some of those raster products, and so you just need to pick a few, so that we can get started.

I asked the group to say, out of these seventy, which ones are the most important ecologically, but also what should I spend my time on first, and the group ranked depth, temperature, current velocity, salinity, dissolved oxygen range, and pH as six layers, and you can see that some are

ranked equally important, and so there is some disagreement on if one was more important than the other, but, in any case, it gives me a roadmap to start with.

When we look at what are the data sources for these six layers, for depth, we can come up with something, I'm pretty sure, with the South Atlantic Council's holdings and FWC holdings. Temperature is just a MODIS product, and we can get a four-kilometer resolution, and that time series would start at 2002, and that is going to be something that we'll have to address later, and then current velocity -- There is a number of model-derived products that we could use, and the NEMO product is a European model.

Then salinity, DO, and pH, people, in the literature that we looked at, are using the World Ocean database, which is an NCI product, and that basically interpolates sampling points from different groups. There might be other sources out there, and, if you know of something that might be better, please reach out to me and let me know, but we haven't looked at those things at the bottom of the list yet, but that's where we're going.

We have a spreadsheet, and this is just -- There is our trophic groups, and there is some representative species in those groups, and then the columns are covariate values, and so like a reported DO range, reported temperature range of occurrence, things like that, that we're just filling in from various sources of literature, and there is twenty-seven groups that we have filled all the values in for so far, and that's ongoing.

The next thing that I wanted to do is -- If people say that a road to a beautiful place is bumpy, we kind of want to look at the road ahead of time and see how many bumps there are, and that's what we're doing here. We just want to establish some base maps in Ecospace, and we want to see at what resolutions will Ecospace even run, because we have never seen a 140-group Ecospace model, and I don't know what that would even look like, and so I just said, well, I'll start with temperature, and temperature is easy, and we have a four-kilometer resolution product, and I will just run Ecospace for one year, and I will define an arbitrary functional response relationship to surface temperature, and that's what is there, and so this is basically saying that, as the temperature gets higher, there is going to be less biomass, and I just assigned this to all the groups, to see what would happen.

You can see, in this little sub-panel on that map -- That's just a zoomed-in view of Charleston, and this is all clipped to the South Atlantic's extent, and so you can see, at this resolution, you can kind of infer some physical oceanographic processes there, which would be useful, and so that immediately did not work, and there was just too many groups, and given the number of rows and columns that are in the raster, and so you just think of this giant matrix, and we're making rows and columns of a raster that are defined by the resolution, and we have to have that matrix applied to 140 groups, and so I said, well, I am pretty sure you can have an unlimited number of groups, and so that shouldn't be the issue, and I confirmed that with the consortium, and so let's try a fifteen-kilometer product and see if that works, and so that worked, and that is what is on the right.

You can see there is some loss of inference there, when you're thinking about those kind of small oceanographic processes, but it works, and that's what it looks like when it's applied in Ecospace to 140 groups, and so you can think of that as it is predicting biomass for every group, given that SST driver, and it's doing that on every time step and, in this instance, for one year, and so let's zoom in on one of those groups.

This is the predicted biomass, given that functional response relationship for a group, and I won't even say what group it is, because this is just a trial run, and it doesn't matter, but you can see just what the effect is of the resolution there, and this might be fine for some applications, but keep in mind, if you want to explore limiting exploitation in the area, and if that area is smaller than fifteen-by-fifteen, that's going to be a problem.

The alternative is that we can run this at four kilometers if we want to, but just on a partner's server or some other application, and there might be a different version of Ecospace that might work better, and so, if that's the priority, we will go down that road. If the group says fifteen kilometers if fine, then that solves a lot of problems right away, but, for now, we know we can at least run Ecospace with this number of groups, and we know that we could potentially use a higher resolution on a better server, but we really need to carefully define these functional responses and spend a lot of time doing that, because, with few exceptions, the biomass, the predicted biomass, is really going to track those functional relationships, and so we want to spend a lot of time doing that.

Moving forward, we're going to have a review panel meeting probably in November or December, and I will be working in parallel with Lauren to kind of define these environmental relationships and identify data and explore different resolution tradeoffs and hopefully have a better update for the Ecospace development at the April meeting, and so are there any questions?

DR. AHRENS: I am just curious why sea color, or chlorophyll, wasn't going in as a layer.

MR. MCEACHRON: Chlorophyll will be in there to drive primary production, but, in Ecospace, when it acts as a multiplier on primary production, you don't need to define a functional response, and so that was just kind of a given, I guess.

DR. BUCKEL: I may have missed it, and I was looking for the presentation from Mike when you first started, but one of the -- I was surprised at one of the covariates, since we spend so much time on snapper grouper in this committee, and the council does, but a live bottom covariate, and I know the SERFS has a good -- Their map for their universe for trapping is a good one, and I know there's a paper out there by Daniel Dunn, I think that provides a map of likely hard bottom habitat.

MR. MCEACHRON: Right, and so the other thing we did in July was we separated groups out by -- We called them pelagic or demersal, and I forget the exact language we used, but the basic idea was that there are some groups where we would want to define some kind of benthic interaction, given habitat cover type or something like that, and so we do have that. That works a little differently in Ecospace, and so, when you just have layers that are hard bottom, or sand, you can just specify a proportion that says how much -- What proportion of the cell does this trophic group use, and so we'll do all of that too, but I just didn't put a slide on that.

MS. LANGE: I am wondering -- The last slide that showed your non-specified species, how will this be used to inform managers? You started off with a small area, and then you expanded to fifteen kilometers, and you are concerned that that might not be a fine enough resolution. In a given day, or a given hour, fish are going to go more than -- If you're talking about the bottom habitat, that's one thing, but the species aren't going to be in that fifteen-kilometer spot the next

time you go to measure them, and I guess I'm just trying to figure out how this is going to inform managers.

MR. MCEACHRON: This run in Ecospace might be from 1995 to now, if we want, 2019, and we could -- One, right off the bat, you can explore the effect of large MPAs, and you could explore the effect of moving MPAs around during that time period and what that would do to the catch of a biomass of different groups, and you could also, if you wanted to explore something about climate change, you could say, well, I have this underlying relationship to temperature, and what happens if I tell Ecospace that the temperature is increasing by some larger rate than is actually happening, and you could see what would happen to the distribution.

In other cases, you might have some anomaly in catch or biomass or some years that you think is related to some environmental change, and say around 2010, when we had those really cold years, and we could say, well, what happened to the distribution of biomass, and how did that affect catch. In a spatially-explicit way, we could do that, and so, at this scale, there are things you can answer right now, and we can make it finer, if we want to explore smaller MPAs or something like that, or maybe small end-type processes, what's happening to the distribution and make inferences about how that changed catch in the subsequent years and things like that.

MS. LANGE: Then how would you groundtruth your predictions? If you're using twenty or thirty-year-old data to make your predictions, and the environment is changing, and the temperatures are warming, and so you're looking at numbers that were generated from a period of a range of temperatures and a range of stock compositions, and I'm just wondering how predictive it's going to be and how it would be groundtruthed.

MR. MCEACHRON: In the Florida Keys model that we did, we had occurrence data, and that's how we ultimately derived our biomass, and so we can come up with spatial validation statistics if we have that kind of data in the region, and I don't know if we do. That's another way to inform these functional response curves. You can basically build a distribution model from occurrence data to inform that line, if we have that, and I don't know if we have that or not, but that's how you would do it.

MR. PUGLIESE: Just one of the beauties of the effort that we have here is that it's connected directly to all the other spatial information systems that we're working with, and so all of our -- What we've been building in the background for web services that have habitat distribution and that have other environmental layers that have connections into the fishery-independent surveys and are ultimately going to be providing species distributions and things that are coming out of the entire overall SERFS systems, and we have connections directly with those, and so the opportunity -- That's what we were trying to do, is the opportunity to align these and figure out how to make it provide enough capability, and some of these aspects that I think Luke was going to highlight is that this was really jumping and trying to see if this thing would even run at this level, and it was good to see that at least, even at a -- The way to do it was to push it up to get that broader resolution.

The opportunities to bring it down into finer resolution advances things that we're already discussing with some of the other partners in the region, and Axiom has capabilities that have already reached out, potentially, to look at providing some of this capability online, and then you could really get into getting finer-resolution-scale operations, and it then also comes to what are the -- It kind of flips it around to what are some of the types of things that the SSC and the council

would like to investigate and then figure out what all these different datasets can inform the system and can build the layers.

It's such a new aspect of Ecospace too, and it's evolved so much further than it was in the past that we really are in some new areas, with such a large model, to figure out the flexibility, to get both the bigger-picture aspects, but then also get fine-resolution capabilities, if we have other partners that can provide the horsepower to make some of these happen, and there are other aspects, to get things such as species distribution, that we have had discussions with, like fathom science out of UNC-W, who was involved in trying to figure out if we could maybe crosswalk with the fishery-independent systems and go beyond some of the heat maps and things that you've seen in the past and connect that with habitats and build these.

The message -- All I was trying to do was say we have the opportunity, and we have connections to all of these different -- At least to get the best information that is available from all of these different systems to inform and expand and figure out what the best spatial representations can move and provide tools and capabilities.

DR. LANEY: Following up on Anne's observation about fish movements, Luke, would it be useful at all, for the purposes of refining the model, to have data on movements and residence time that have been generated from acoustic tagging data, because those data are becoming more and more abundant and available, and I know Jeff has got a student, Riley Gallagher, who is doing this work for cobia on the east coast, and there's another grad student at VIMS, whose name escapes me at the moment, but is also doing a similar project, and then this gentleman sitting next to me generated a bunch of Atlantic sturgeon acoustic data, and he actually did the analysis, right, Jared, for the last Atlantic sturgeon stock assessment of all those acoustic data.

We are getting a lot of information about not only where fish go, from Point A to Point B, but how fast it takes them to get there and where they may linger along the way and all those sorts of things, and so is that going to be something that is useful to feed into the model?

MR. MCEACHRON: Definitely, yes, and so there's another parameter in here that we didn't discuss, and it's basically a diffusion parameter, and so, at each timestep, it tells Ecospace how quickly any given trophic group can fill in their surrounding cells, and so that -- You can scale that to some known rate of movement.

DR. LI: What is a timestep?

MR. MCEACHRON: In this case, it's monthly.

DR. AHRENS: I think the question of why are you building these models and what questions are you trying to ask is a really important question, and, to date, questions have been questions related to coastal security, in terms of, if you input things like IPCC scenarios and look at temperature shifts and those sorts of patterns, what is the expected change in the distribution of communities spatially, and then, inferring from that, what impact that might have on coastal communities, is one question that's being asked.

I think there is a question of MPAs that go in there, and there's a question of how, given changes in targeting preferences of fleets, might we expect to see the distribution of fleets change, and how

might that affect bycatch and those sorts of questions, and there's also questions of marine coastal planning at a coarse scale, but it's critical to remember that this was developed as a tool to explore hypotheses and give insight into what the important things to consider and observe might be.

It is utility, as a prescriptive management tool, to say this is what the biomass is going to be here, and I don't think anyone kids themselves that it's capable of doing that at the scale that we would like, but it behooves maybe the SSC, but also the council, to say what do we want to know, are our questions questions of how fleet distributions may change over time, in response to changes in oceanographic conditions, and are they questions of coastal security?

I mean, if we see that vessels coming out of this area are going to be traveling twice the distance just to achieve catches that they want, then what are the economic costs, and what are the cascading costs of that, and so it's a tool to explore those in a gaming scenario, to give insight into things that you have to watch out for, but, if you don't have the questions, then I think you can build these, but they're just going to sit there, and so I think it's really helpful to say what are the key questions that we want to ask.

MS. LANGE: I guess that's my point, as I said at the last presentation, is color me skeptical. I don't know that the questions have been asked, and I don't know that the managers are aware of what those questions should be and what types of things can be answered, and I take this with a grain of salt, and I'm not trying to offend anyone, but I just don't know -- I have been working on fisheries for almost fifty years, and there's always an issue, and others of us here longer, and there is always an -- Every assessment we do, we always need more data, and we also need more stock assessment scientists, and I am just concerned that, as more and more effort goes into these -- To me, it's like a video game. The more data you get, the fancier models you can get, and I know we need that.

I am not trying to live in the dark ages, where we were using hand calculators to do our assessments, back when I started, but I am just wondering what the tradeoff is with trying to get done what stock assessment scientists need to do to address management needs versus going on to this -- Taking money and staff away from that to go into some of these things that are -- Again, I don't know the bottom line that's going to come out and how predictive they are and how useful they are going to be in the real world, when you're talking about advising and informing fisheries managers, and I guess that's the concern I have, and my skepticism -- Again, knowing that we are hurting for scientific advice directly related to the assessments that we're mandated to provide advice on, but, anyway, that's --

DR. SEDBERRY: Those are very important questions, and something we could probably spend another few days looking at, and those are the kind of visioning questions that the council and NMFS need to address, and I understand why you question this. You know, we need to set an ABC tomorrow for something, and how in the world does this work relate to that, and, again, these models raise a lot of interesting questions and points for important research areas where we need to answer some of these questions, and they provide a lot of background information and understanding for the productivities of these fisheries stocks, but I can understand why it's -- We have all these pressing stock assessment needs, and why are we spending resources on this, and so I kind of understand that, but I don't think that's something that the SSC can address.

MS. LANGE: Just quickly, I am not saying that this is not important work, but I am just wondering where the balance is between what we go through every meeting that we have, that we don't have the data for this, and we don't have the personnel to do the assessments for this, and anyway.

DR. SEDBERRY: I understand.

DR. LANEY: Roger Pugliese and I have been having this discussion for at least twenty years, I think, haven't we, Roger? So not quite fifty yet, Anne, but it's heading in that direction, and, to me, balance is important. Assessments are predominantly single-species based. The west coast is ahead of us, maybe, in terms of doing multispecies assessments, and ASMFC has played around with some multispecies assessments that begin to move us toward ecosystem-based fishery management.

To me, personally, I don't think we have a choice but to move in this direction that, yes, while it's not going to lead us to be able, yet, to give specific management advice about how much biomass we can expect to get out of a four-kilometer, or fifteen-kilometer, grid yet, we're headed in that direction. I think Luke would tell us, and Lauren, that, when Ecopath was first developed, they would have probably told you that you're crazy if you think that you can ever run one with 140 functional groups in it.

It has made tremendous progress, and it continues to make progress, and, from my perspective, running the kinds of what-if scenarios that we can come up with as an SSC, and as a council, and from staff as well, will help us to avoid, maybe, some of what I perceive as pitfalls of single-species management that have occurred in the past, and one of those is some of the management things that we have done is to select levels of stock production that we as humans like to see, such as, for example, striped bass, being one very familiar to me and Alexei, where what we do, when we target a single species like that, is, in that case, we create a giant eating machine, which then goes out and consumes tremendous quantities of blue crabs in the Chesapeake Bay, which upsets all the blue crab fishermen, and lobsters off of New England.

I think one of the things that these sorts of models can do is to help us gain some insight into what sort of impact we're going to have on the trophic relationships of all those different species that we're interested in, and maybe help us to avoid, to some extent, to the extent the model can suggest that, well, if you push this species to this level of spawning stock biomass, this is the impact that you're going to have on those communities, like Rob pointed out, that are fishing blue crabs, or fishing American lobsters off of New England, by pushing striped bass to X level.

You could make the same case, I think, for spiny dogfish. We kind of did the same thing there, when we picked the target for restoration for spiny dogfish, at a time when spiny dogfish were probably at an all-time high, because of the collapse of the New England groundfish fisheries. For things like that, I think there's a lot of things we can do, by going back and looking at the history. That will then, I think, help us to generate some of the questions that the SSC can suggest to the council that they might want to ask.

DR. SEDBERRY: Very good point, Wilson, and, of course, that's very important, in terms of what's happening with, potentially, maybe happening, with red snapper and black sea bass, or goliath grouper and spiny lobster, and so it is relevant, and it's just -- It's difficult to fit it all in.

DR. LANEY: Just one follow-up comment, to Anne's point, again, in terms of balance, part of the reason that we're unbalanced is because we don't have the resources that we need to do our jobs, and the reason for that is that our stakeholders have not done a very effective job, I think, addressing Congress and convincing Congress to give us the funds that we need, and, when I say we here, I mean the whole fishery management family, state and federal agencies and NGOs and everybody. At some point, maybe society will realize that it's more important to spend money on fishery management and healthy coastal communities and resilience than it is to buy 200 or 300 more new F-18s.

DR. SEDBERRY: Okay.

MR. MCEACHRON: It sounds like future talks would benefit from a couple of slides of what other people have done and how this has been used, and so I can do that. The other point that Lauren made was that, just by going through the process of making these models, you identify gaps and limitations and research priorities.

The other thing is that people that are more recently using this ability to feed in satellite imagery -- The other way that people are using that is to understand increasingly volatile environmental events, and so, for example, like hypoxic zones to the Mississippi plume water. Something like that happens, and, often, at least at FWC, there is a request to predict possible outcomes, like right away, and so you don't have a year or two to build something out and then give an answer. Like you kind of want that capability already, and the heavy lifting is the diets and the mortality rates and the landings, and, once that's done, you just have it, and it's a tool in your toolbox.

DR. SEDBERRY: Before I ask for any additional questions from the committee, I want to make sure that there is no public comment on this agenda item at this point. Any public comment? No public comment, and so are there any additional questions or comments on Ecopath/Ecosim/Ecospace for Luke or Lauren? All right.

Our action item on this is approve the timing of the workgroup's model review and path forward, and the last slide there had a timeline for moving forward, and it doesn't have a lot of detail. The review panel is having a webinar at the end of the year, and, again, there are several SSC members on that review panel, and they're going to continue to investigate environmental relationships and data availability and give us an update on all of that at our April meeting. The draft of the overview document that I had said that no specific actions were required, but we can -- It would be nice if the SSC had a statement here regarding progress and the proposed timeline and that we like or don't like what they're doing, and we look forward to their update.

MR. PUGLIESE: Essentially, the review was set in motion once the modeling team workgroup was selected, and so what we want to do is get these updates from what came from the last discussion and re-emphasize that it is advancing, and maybe there's a little delay, because we want to take advantage of some of the new guidance to get the latest balanced models, and so what is envisioned is the initial webinar happening in November or December, and then multiple webinars in advance of, as stated earlier, in advance of the April 2020 meeting, so that the presentation -- Simultaneously, there is the activity on Ecospace advancing, and that's not in the review, but why delay that, and, hopefully, when we get to that meeting, there will be an update on how far that's come along, too.

The idea is that the review will be completed, and we'll have an update on Ecospace at the April 2020 meeting, and we've even put a window in there of, if we need an in-person meeting in February of 2020 of the workgroup, we can figure out a way to make that happen, but this was, essentially, kind of the timeline, and it's just maybe a month different, that was looked at when the model group was brought forward and the initial path forward was discussed at the last meeting.

DR. SEDBERRY: Okay. Thanks, Roger. Does the committee have any objections or heartburn or problems with what Roger has just outlined?

DR. AHRENS: I think one of the challenges is going to be the extraction of the data at the various spatial scales for the Ecospace, and I would encourage you to try and automate that, so that, if a decision is made to change the spatial scale, that it's not an incredibly laborious task and that they can easily FTP into whatever NOAA data sources you're using and change the scale of the grid and extract that data in an efficient manner, because I think, depending on the questions that are going to be proposed, you may be forced to adjust that spatial scale.

MR. PUGLIESE: I think that's one of the reasons that we kind of separated the review of the Ecopath with Ecosim, but I think, in understanding what that generation is and how it influences that, it will guide how we advance -- One of the beauties too though is, as you know, there's an upcoming Ecopath thirty-five-year meeting, which will have everything from the consortium to all the players involved, and we're going to have a pretty significant presence, and we may do some coordination to help advance and get these kind of things upfront, so that, as this evolves even further, those kind of guidance points really make it a lot more operational and able to meet the needs of the types of questions and activities that are anticipated, either on the spatial side or the general side, from the panel in the future.

DR. LANEY: Following-up on Rob's earlier question about how important it is to formulate the questions, would it be useful at this point, George, for us to suggest to the council that, based on the progress that's been made and the impending ability of the council to ask questions, using the model as a tool, to go ahead and ask the council to begin thinking, at their December meeting, about questions, and Roger may want to weigh-in on this.

I know the Habitat and Ecosystem Committee has been moved to the March council meeting, but I don't think it's too early to suggest to the council that they ought to be thinking about these questions now. I mean, Rob raised some of the potential applications, and so is that something that we would like to go ahead and suggest to them that it's not too early to start thinking about that?

MR. PUGLIESE: First of all, we don't have a Habitat and Ecosystem meeting at the December meeting, as you stated, and so I think that's -- However, it was very specifically intentionally laid out so that the SSC has the opportunity to see the reviewed model, and we advance Ecospace to a further level, and they also have the opportunity and have the ability to weigh-in on the initial -- Then the council will be brought up to speed at the June council meeting on the completed model, advancements on Ecospace, and it will be set in motion then where do you go, in terms of operationalizing this, to be able to use it, and what are the types of questions.

I think it gives it -- While I think getting early input -- I think there's been statements already that are directing this, and some of the discussions has had and directions the council has had on we

need to begin to address the issues of species moving north and how do we deal with our partners to the north, and there's a lot of things that are developing in this process that are going to help connect some of those with either the Mid-Atlantic regions, or other regions, but also have the crosswalks between the spatial inputs or the systems that are supporting it, such as the fishery-dependent systems that I think are going to happen as we advance this.

It was intentionally laid out so that the SSC really kind of has the first ability to review and then provide input and then set the stage for council members, and we have our Chair of Habitat Committee, and we have the Vice Chair of the Council, and we've had the Chair of the Council in here, and so I think those discussions can happen, wherever they want and will, and I think we're already getting some of, well, if we can do this, let's begin to do it, and so I think it's definitely in their queue already, but that was why we set that timing, to kind of give the SSC the opportunity to kind of really give it as much review and then advancement and also set the stage for the longer term, because, by the time we get to that point, this model should be so far advanced, in terms of the ability to begin to actually address those types of questions, but that's just where it is, and however you all want to address that. I think a message saying reviewing sooner rather than later is definitely a powerful message from the SSC.

DR. LANEY: To George's point earlier, to me, even though we didn't have a defined action item for this one, I think it's certainly appropriate for us to acknowledge the tremendous amount of work that's been done since the April meeting and since July by the FWRI staff, Lauren and Luke and Roger, in coordinating a lot of this stuff too, and so I would be fine with putting a statement like that into the record of the meeting.

DR. SEDBERRY: Okay. Mike is drafting something now.

DR. ERRIGO: I can draft something, or, being that it's that kind of statement, if the SSC wants to just draft something for the report, and I think that would be appropriate.

DR. SEDBERRY: Yes, and we can do that. Just put a placeholder in there for it. Any other comments on the ecosystem model update? Very good. Our next agenda item is Agenda Item Number 11, the Dolphin Wahoo Amendment 12 regarding bullet and frigate mackerel, and, Anne and Yan, I have you down for notetaking on this.

For this agenda item, we had Attachment 14, which is the Amendment 12 decision document that outlines what the issue is, and this relates back to some of our discussion of ecosystem species, ecosystem component species, that we've had over the past couple of days. The Mid-Atlantic Council has dealt with this issue and kind of passed it back to the South Atlantic Council, the way I understand it, but John Hadley is going to fill us in on what's going on with this, and then we'll have public comment and address our action items, and so thanks, John.

DOLPHIN WAHOO AMENDMENT 12: BULLET AND FRIGATE MACKEREL

MR. HADLEY: All right. Thank you. I will start off with a little bit of background on this topic. As mentioned, the request to examine managing these species as ecosystem components in the Dolphin Wahoo Fishery Management Plan originated from the Mid-Atlantic Fishery Management Council, and the Mid-Atlantic Council has undergone an unmanaged forage omnibus amendment,

and, really, this was a comprehensive look across their fishery management plans to look at what species should be and could be listed as ecosystem components.

Bullet and frigate mackerel were originally proposed for inclusion in that amendment. However, in the end, National Marine Fisheries Service issued a statement that they could not include those, the two Auxis mackerel species, in that amendment. They cited inconsistency with National Standard 2 as it relates to -- That really related to the criteria that the Mid-Atlantic's SSC set for helping the Mid-Atlantic Council decide which species should be considered ecosystem components, and part of that criteria was a size criteria, and so the two Auxis mackerel species fell outside of that size criteria, and so that was one of the issues that the agency cited.

Also, there is insufficient connection to the Mid-Atlantic Council's managed species, and that was another one, and then there were some concerns that these stocks are being caught and retained in some recreational and commercial fisheries, and that could exclude the consideration of the two species as ecosystem components, I think "could" being the functional word there and not "would", and so it was a compilation of those three concerns that led the agency to issue a statement that they -- Or to disapprove including these two species in the Mid-Atlantic's forage omnibus amendment.

In response, the Mid-Atlantic Council wrote a letter to the South Atlantic Council requesting that the two Auxis mackerel species be managed in the Dolphin Wahoo Fishery Management Plan as ecosystem components, one being that they are forage for both dolphin and wahoo, and also, looking at that geographic component of the Dolphin Wahoo Fishery Management Plan, it covers the entire east coast, and so the Dolphin Wahoo Fishery Management Plan -- The South Atlantic Council is the primary council for managing that fishery management plan.

However, it covers the entire east coast, and so it goes beyond the South Atlantic region, and it covers from Maine through the Florida Keys, and so those are the two portions of the dolphin wahoo fishery and the Dolphin Wahoo FMP that were appealing for potentially adding these two species as ecosystem components, and, really, in developing of this amendment, the South Atlantic Council took this up starting at their December 2018 meeting, and, since then, they have gone through several presentations, and they received a presentation of some work that Steve had done on dietary studies of offshore pelagic predators, specifically focusing on the dolphin and wahoo portion of that. There's been additional white papers that looked at sort of the mechanisms of adding an ecosystem component to a fishery management plan and looking at the guidelines of what is an ecosystem component and what should be considered by councils when they are trying to examine which species could potentially be ecosystem components in their FMPs.

The council has sent this out for scoping, and we'll review some of the comments that have been received in a little bit, but, really, in the end, the way the council has initially gathered information, they looked at how other councils have addressed unmanaged forage species as ecosystem components in their fishery management plans, and so they have examples from the Mid-Atlantic Council, the North Pacific Council, as well as the Pacific Council, and so there are several different ways that the different councils have addressed this.

In the end, they came up with some general options for moving forward, and we'll get into the details of this, but, as an overview, looking at designating ecosystem component species with no management-related items, and so that's similar to the South Atlantic Snapper Grouper FMP, with

some of the species that were discussed a few days ago. Then looking at prohibiting or limiting a directed fishery through a trip limit or potentially an annual vessel limit, implementing a reporting requirement, and so, essentially, these species would need to be -- If they were to be landed or caught, they would need to be reported through existing reporting mechanisms, such as on logbooks or dealer reports. Then implementing a permit requirement, and so a permit would need to be -- A vessel or vessel operator would need to possess a permit in order to land the ecosystem component species, and then implementing a protocol for building directed fisheries.

Really, when you look at the overarching aspect of how different councils have addressed these unmanaged forage species, they're really looking at freezing the footprint, and so they're not necessarily prohibiting a fishery for them, but they're sort of freezing the footprint so there's not an unexpected ramp-up in landings for some of these important forage species, and so that's kind of the background of how the council has generally been addressing this, and, if there's any questions, I will take a break, I would like to take a step back and get into the mechanisms of what an ecosystem component species is. If there are any questions, I will move forward after that.

DR. SEDBERRY: Are there any questions at this point? I don't see any.

MR. HADLEY: Okay. Moving forward, there's been some discussion that kind of jumped around this topic of what is an ecosystem component species, and so an ecosystem component species is defined as stocks that a council or the Secretary has determined do not require conservation and management, but a desire to list in the fishery management plan, in order to achieve ecosystem management objectives, and so the key -- To me, within that definition, the key terms are "require conservation and management", and so there's kind of a question-mark there of how do you determine whether a species is in need of conservation and management.

The National Standard general guidelines lay out ten different considerations, or factors, that a council should consider when determining if a species does require conservation and management, the first being if the stock is an important component of the marine environment, if the stock is caught by the fishery, whether a fishery management plan can improve or maintain the condition of the stock, whether the stock is a target of a fishery, or if the stock is important to commercial, recreational, or subsistence users, the fishery is important to the nation or regional economy, the need to resolve competing interests or conflicts, the economic condition of the fishery and whether an FMP can improve more efficient utilization of that resource, the needs of a developing fishery and whether a fishery management plan can foster orderly growth, and the extent to which a fishery is already managed, and so are there existing management structures, either federally or on a state level, where that species is adequately managed.

When you look at these, they're not -- The plan development team for this has gone through this kind of ten-factor list, and they are not necessarily yes or no questions, and so it's not really a -- It's something that you need to address, but it's not really a cut-and-dried answer of yes or no, as far as whether or not a species can necessarily become an ecosystem component.

However, if it is determined that a stock requires conservation and management, then these stocks must have ACLs, other reference points, and accountability measures, and we're all very familiar with those. Other stocks that are identified in the fishery management plan, such as ecosystem component species, do not require ACLs, other reference points, or accountability measures, and so that's kind of the difference there on the conservation and management question and whether

or not a stock is in need of that. Are there any questions on that before I jump into some of the specifics of bullet and frigate mackerel themselves? All right.

Then, moving right along, I will jump briefly into some information on bullet and frigate mackerel and their connection to dolphin and wahoo, particularly wahoo, but bullet mackerel are approximately twenty inches in length, and the two species really do -- Bullet mackerel and frigate mackerel resemble each other quite a bit, and so there certainly could be some species ID issues there, but, overall, they are found from approximately Cape Cod through the Gulf of Mexico, and they often form schools.

Frigate mackerel being very similar, and they reach approximately two feet in length, and they also exhibit schooling behavior. They are typically found -- They have a little bit more southern distribution, and they are typically found from North Carolina through Florida.

Really, both bullet and frigate mackerel have been identified in the diets of dolphin and wahoo in the northern Atlantic, and wahoo particularly have shown a strong reliance on the two Auxis mackerel species, and there have been several studies done. However, in all of these studies, they exhibit similar results, where there is a very strong reliance of wahoo on bullet and frigate mackerel, and they have been observed as the most dominant species by mass and by number, and estimates have ranged from approximately 30 to 50 percent of wahoo diets are made up of the Auxis mackerels, and so there is a strong connection there. Dolphin tend to have more diverse foraging behavior and a lower reliance on the Auxis species, but they have been identified as important prey for dolphin at certain times.

Looking at some basic fisheries information, within the document, there is commercial landings of frigate mackerel over the past twenty years, and there are no recorded landings of bullet mackerel over this time range. However, as I mentioned, there could be some species ID issues, and it has been brought to our attention that maybe some trip ticket coding issues, where they might have been -- There may not be a specific trip ticket code available for bullet mackerel, and I believe there have been some changes, North Carolina being one of the states where they have diversified their trip ticket codes, where they are now picking up landings specifically of bullet mackerel, and so 2018 landings likely -- There will likely be some 2018 landings for bullet mackerel.

Looking at some of the commercial landings, they have been fairly low over the past twenty years, and you see one kind of spike to 36,000 pounds in 1999, but, in recent years, you have had very, very low landings. As you can see, many of the landings are so low that they are confidential, and so very few people are landing these species commercially. Looking at the ten-year average, approximately 1,700 pounds per year, and approximately $1,700 worth of ex-vessel value.

Moving over to the recreational side, this similar table provides recreational landings of bullet and frigate mackerel, and, as you can see, in many years, there are no recorded landings, and, many of the years where there are recorded landings of the two Auxis mackerel species, there is a very high associated PSE, and so those estimates, for the most part, are largely uncertain. However, looking at the ten-year average of landings, approximately 2,300 pounds of -- I believe those are bullet mackerel and 7,000 pounds of frigate mackerel, and the two mackerel species together are approximately 9,500 pounds, the point being there are landings of these species, both

recreationally and commercially. However, they are very sporadic, and they certainly vary from year to year.

Looking at some of the input that has been received so far on this topic, as I mentioned, this amendment has been sent out for scoping, and so gathering initial public comments on the concept of adding the mackerel species to the Dolphin Wahoo Fishery Management Plan as ecosystem components, and the council received 117 comments, which is a pretty good turnout for an issue such as this, and so there are quite a few interested parties, and the comments were overwhelmingly expressing support for the council adding the two mackerel species as ecosystem components.

The Habitat Protection and Ecosystem-Based Management Advisory Panel reviewed this topic, and they strongly recommended that the council take proactive actions for bullet and frigate mackerel, due to the sound existing science regarding their importance as prey for wahoo and dolphin. Finally, the Dolphin Wahoo Advisory Panel reviewed this topic, and they were largely supportive of the council moving forward. They passed two motions to recommend that the South Atlantic Council designate bullet and frigate mackerel as ecosystem component species in the Dolphin Wahoo Fishery Management Plan and also endorse that the council proactively protect the species as prey, and so endorsing the concept there.

Also, as far as potential regulatory actions, they suggested that the council should consider regulatory actions in conjunction with adding bullet and frigate mackerel as ecosystem component species, and, really, looking, there again, at sort of a freezing of the footprint and preventing a large ramp-up in potential landings of bullet mackerel or frigate mackerel. Before I get into the measures of the amendment, I will take another break for any questions on the two species themselves. All right.

Looking at some of the proposed measures that the council is initially considering, the first being designating the two Auxis mackerel species as ecosystem components in the Dolphin Wahoo Fishery Management Plan, and so that's kind of step-one in the process. Then, from there, the council is looking at establishing a permit requirement for landing bullet and frigate mackerel and establishing reporting requirements for bullet and frigate mackerel, potentially establishing a commercial trip limit or commercial annual vessel limit for the two mackerel species, examining a recreational bag or a vessel limit for the two mackerel species, and then looking at establishing a process allowing the development of a directed fishery, and so really an orderly development of a directed fishery for bullet mackerel and frigate mackerel, should the need arise in the future. Then also examining a potential prohibition on the sale of bullet and frigate mackerel.

Looking at the potential amendment timing, one of the reasons that we're bringing this amendment to you fairly early in the process is that this amendment could move very quickly, making sure that the SSC does have a chance to at least review the actions of the council, the initial actions of the council, and so they have really started -- They are moving along with development of this amendment, and it could potentially come up for formal review in September of 2020.

Looking at the draft purpose and need, and I won't get into the details of it, but, really, the purpose and need of the amendment is focusing on the importance of the two Auxis species, mackerel species, as forage for wahoo, and so that's one of the main components of the purpose and need, and looking at the options for the potential actions that are going into the amendment.

As I mentioned, Action 1 designates bullet and frigate mackerel as ecosystem component species in the Dolphin Wahoo Fishery Management Plan, and, for the moment, this is as far as the council has made it, as far as adding actions to the amendment, the reason being the other actions that could potentially affect fishery participants outside of the dolphin wahoo fishery, and so, there again, coming back to that jurisdictional range of the Dolphin Wahoo FMP, it ranges up into the Mid-Atlantic and up into New England.

There are some questions on what sort of potential regulatory measures could be put in place. For example, if there are trawl vessels or vessels fishing gears that are not allowable in the Dolphin Wahoo FMP, how should the council, or how could the council, go about addressing those, and so, during the September council meeting, there was a very lengthy discussion on this, and the council ended up adding Action 1, and then the National Marine Fisheries Service is working, and the Regional Office is working, with Headquarters to formulate guidance on which regulatory measures would be appropriate for the council to take in regard to bullet and frigate mackerel. With that, I am happy to go through the other actions and alternatives in the amendment, but, for the sake of time, I will stop here and pause for discussion.

DR. CROSSON: You said that, when they are commercially caught, they are used as bait, and they are used as bait by whom, by the commercial fishermen themselves for trolling for wahoo? I am not quite sure on that.

MR. HADLEY: They are often caught as bait and used during a commercial trip or a recreational trip. They often don't make it back to the dock, so to speak, and so there is that portion of it. The commercial landings, that's to be determined, and I am not really sure what the end use is of them, and I imagine it's likely -- It likely is for bait, but I'm not positive.

DR. AHRENS: I apologize for this, but I'm just confused. If you go up to the top for the definition of an ecosystem species, it says they do not require -- It says an EC species is defined -- We have determined they do not require conservation and management, but it seems that a lot of the reasons why this would be going into the fisheries management plan is for conservation and management. Please help.

MR. HADLEY: That is a question that I have asked myself several times, but, as I have looked into it more, it's -- I think a lot of it has to do with this ten-step list of factors and how that plays into conservation and management, because, when you think of it, as you mentioned, if you're adding them into the fishery management plan, there is clearly some cause for concern, that they need some sort of protection, of sorts, and, to me, it has to deal with semantics and the definitions of conservation and management, versus the perception of that, if that makes any sense, and how it's defined in law, in the Code of Federal Regulations, versus the perception of it, and it is -- Like I said, I have asked myself a very similar question several times.

DR. SEDBERRY: So it's being incorporated into a management plan because it doesn't need management. It's a little strange.

MR. HADLEY: Right, and, on that note, we are -- I will let Shep chime in in just a second, but the actions are -- We are referring to them as regulatory measures, and so there is -- It's very important how they are referred to, in that respect.

DR. SEDBERRY: I believe Shep is going to clear this all up for us.

MR. GRIMES: I don't know that I'm going to clear anything up. I think this is a fairly muddy issue, but the regulatory guidance on this is that these stocks are not in need of conservation and management, and we're not managing them, per se, but we're going to do things to existing fisheries in order to protect an ecosystem role, or the ecosystem function, served by the species, and that's not an easy line to draw, and there are a lot of potential management measures that are in the list that John presented and that the council developed that seem a lot more like managing the harvest of the ecosystem component rather than just managing an existing fishery to protect that ecosystem role, and it's not going to be an easy line to draw, but I don't think that is something that the SSC needs to fret much over, and you're welcome to provide whatever feedback on that, but, ultimately, I think it's a management question, and largely a legal question, as to what can the council do, and that has all yet to be decided. Thank you.

DR. AHRENS: That actually clarifies it. Thank you.

DR. SEDBERRY: Thanks, Shep.

DR. SERCHUK: It seems to me that it's proactive to include species such as this into a management plan, because of their ecosystem importance, and, once they're in the plan, in my mind, should something develop that would jeopardize the status of these prey species, such as a commercial fishery, you have the machinery to stop that, to regulate it, to minimize that, and, in my mind, that's the proactive nature of bringing in unregulated species that are not overfished or overfishing is going on, to prevent that to happen, should an event occur in the future that would provide some threat to the species, and it would be development of a fishery or it would be something else, but at least you have the regulatory ammunition then, if it's within a management plan, to proceed in that direction.

DR. SEDBERRY: That's a very good summary.

DR. SCHARF: Besides the inconsistency with the guidelines, it also said that it didn't meet the size criteria for the Mid-Atlantic Council's sort of definition of an ecosystem species, and so can you provide a little bit more detail on their criteria? Do they have a whole list of criteria, or is that just one? I don't know that we have any criteria, right? Do we have any criteria in the South Atlantic?

MR. HADLEY: No, I don't believe we have any criteria in the South Atlantic. The Mid-Atlantic Council's SSC did come up with a full range of criteria that should be examined to help the Mid-Atlantic Council narrow down their forage focus, so to speak, and so they really started from a very, very wide comprehensive look at all forage species across all their fishery management plans, and they needed help kind of narrowing it down and saying, okay, we have all these species, what should we qualify as an ecosystem component, and that's where their SSC came into play, and one of those parameters was size.

However, it's worth mentioning -- Off the top of my head, I can't think of any kind of large pelagic predators that the Mid-Atlantic manages, and so that likely -- I am not positive, but I am imagine that likely played into the Mid-Atlantic's definition and kind of their size range that they suggested, whereas the South Atlantic does manage dolphin and wahoo that do prey on larger species.

DR. BUCKEL: I will just add to that. Looking at some of the letters that the Mid-Atlantic -- They used the max size of the bullet and frigate to compare to their definition, and one of the letters said that they should be using the size that occurs in the predators, which I agree with, and so, when they looked at the size that was in the predators of bullet and frigate mackerel, that did meet their criteria.

DR. SEDBERRY: Any other questions or comments? We need to make sure that we have addressed the two action items. Does the SSC support consideration of bullet mackerel and frigate mackerel as ecosystem components? Yes. Review and provide recommendations regarding actions and alternatives as necessary.

DR. CROSSON: But John said that, right now, they're just intending to put it in there, and the rest of it they are waiting on guidance from NMFS, and so I expect that we'll see this again.

MR. HADLEY: That's correct. You are likely to see it again -- Assuming that other actions remain in the amendment, it will slow down the process, and the SSC will be reviewing it again, but, for now, we're waiting on guidance, and we're expecting to get guidance at the March 2020 meeting, and so, until then, the other actions in the amendment are uncertain.

DR. SEDBERRY: That makes me think that, at this point in time, the SSC has no additional recommendations.

DR. CROSSON: I don't have any additional recommendations for up there, but I have questions about this ecosystem component species. Since this came up during the meeting repeatedly, when we were talking about all the different species, and we were talking about the relatively obscure snappers and things like that, NMFS disapproved this for the Mid-Atlantic SSC, and I understand they are saying that it didn't connect with any of the FMPs that the Mid-Atlantic Council had, right, and that this species was not a component of that, and the second thing we talked about was the size, but this third one is inconsistency with criteria, blah, blah, blah, that explains the ecosystem component species should not include target stocks that are caught for sale or personal use.

When we were talking about these different snappers that had like 1,000 pounds of landings, and they were sort of targeted, and they were targeted as part of the group of snappers and related species, and does that indicate that some of those species that we had thought about including as ecosystem components, because of their low landings in the snapper grouper complex, would not be eligible for that?

DR. SEDBERRY: I think these are Mid-Atlantic.

DR. ERRIGO: He's talking about the unassessed species that we went over. It's going to depend on whether they are incidentally encountered and caught, and then they bring them back to the dock or if people are actually going out to get like margate or sailor's choice, but I did hear though that, in southern Florida, people are -- They are advertising trips for sailor's choice, because they look like gray snapper, so that people can get pictures with their gray snapper, even though it's not a gray snapper and it's a sailor's choice. They look very, very similar in the pictures, but that seems to be the only area where that is happening. However, it is apparently happening.

MR. HADLEY: On that note, I believe, as the SSC made the recommendation to consider them -- The list of snapper grouper species as ecosystem components, we would likely be -- Assuming that moves forward, we would be working through that list of ten factors and determine how that relates to that specific species, and so that's kind of the process that we would go through there.

DR. CROSSON: I just wanted to add in there that the SSC has no additional recommendations, pending guidance from NMFS.

DR. SCHARF: Just to address Jeff's point, I'm looking at the size data we have from the diet data from wahoo and dolphinfish, and so the sizes that are in the stomachs are in the ten to twelve-inch range, as opposed to those max sizes, which are two-plus feet, and then, just to add some more sort of ammunition to their importance in the region, we had diet data for not only wahoo and dolphinfish, but also tuna, yellowfin and blackfin tuna, and so this prey group is really important to yellowfin tuna as well, in terms of the most dominant forage fish that they eat, anywhere from 15 to 20 percent frequency of occurrence, contribution by mass, and so, in addition to wahoo being almost sometimes 50 percent of their diet.

DR. SEDBERRY: Any other questions or comments or input?

DR. BUCKEL: I had a question just about the -- I realize that bullet and frigate are being discussed here because that came out of the Mid-Atlantic, and there was a request there, but did any of the -- Did the Dolphin Wahoo Committee and Advisory Panel discuss the other prey that are important to those two species, in addition to the bullet and frigate mackerel, which there was a request from the Mid-Atlantic Council, but dolphin eat a lot of flyingfish, for example, and so that might be another one that would be added here, and was there any discussion about other species besides bullet and frigate mackerel?

MR. HADLEY: Yes, there was, and the council actually discussed that, and so I believe that it was at the March meeting of this year. They received a white paper that had a general overview of the dominant prey species for both dolphin and wahoo. Obviously, particularly for dolphin, it's a wide range of prey there, and they had a great deal of discussion on including other species in this, and they ended up wanting to narrow the focus down to specifically bullet and frigate mackerel, and so that's -- We took that direction and went with it, but there was an earlier discussion of that, and it's a topic that, potentially down the road, I wouldn't be surprised if they came back to revisit, but, at the moment, I think, since they do have the request from the Mid-Atlantic, and there are several studies showing similar results, that those two -- That the two Auxis mackerel species are important to wahoo, and they ended up just kind of narrowing the focus, very much so, just to the bullet and frigate mackerel.

DR. SEDBERRY: Any other discussion? Does the committee agree with the two statements we have up there regarding the two action items? They are pretty straightforward.

MR. HADLEY: If I could just clarify the first statement, recommends adding bullet and frigate mackerel to the Dolphin FMP as an ecosystem component.

DR. SEDBERRY: Excellent. Yes. Okay. Very good. I think that completes this agenda item. Thank you, John. I think we already took public comment on this, didn't we? Well, just in case,

is there any public comment on what was presented regarding Dolphin Wahoo Amendment 12? I don't see any. Now we're officially done with this agenda item.

DR. ERRIGO: There is the council workplan, which I will just very briefly go over what amendments are going through the works, and there is the table of the workgroups that are currently active, and then there's Other Business, and there was that one additional item under Other Business, and that shouldn't take very long. Then we do need to look at the next meeting, the April meeting, and make a final decision, or at least a preference over which week to have that. It sounded like, yesterday, that overlapping the MREP meeting might be pretty much the only choice we have, but we should discuss that.

DR. SEDBERRY: What I'm thinking is that it looks like, if we work through lunch and aim to finish at 1:00, or possibly go to 1:30, that might be able to just power through all of this and finish up early, rather than breaking for an hour-and-a-half at noon, and so, if everybody is happy with that, we will just keep on going. All right. We might get done earlier, but it's very hard to forecast, predict, or otherwise tell what might happen. Again, the next item is Agenda Item Number 12, and we're going to get a summary of this from council staff, and we don't have any assignments for taking notes on this, but this included Attachment 15 and 16 in the briefing book, and so you're handling this, Mike?

COUNCIL WORKPLAN AND SSC WORKGROUP UPDATE

DR. ERRIGO: Yes, and I will just briefly go over what's going on in the world of the South Atlantic Council. We have several amendments in the works right now. One that Chip is the lead on is the Coral Amendment 10/Golden Crab Amendment 10/Shrimp Amendment 11, which is looking at access areas for the trawlers, shrimp trawlers, and golden crab guys.

We have the Fishery Ecosystem Plan, which Roger is doing. I was just informed that the golden crab component is no longer part of this suite of amendments, and so it's just the shrimp guys and looking at access areas for the shrimp trawlers. Then there is the Fishery Ecosystem Plan, which is ongoing, and Roger is the lead on that. Chip is also lead on Snapper Grouper Amendment 46, which is our favorite, red snapper, and so management measures concerning red snapper and recreational reporting, and so there's consideration of having some kind of recreational reporting system.

Roger is also the lead on Abbreviated Framework 3, and we're finally getting to updating the ABC and ACL for blueline tilefish, and we had an agenda item about that during this meeting, and so that's updated to the SEDAR 50 numbers. There is Dolphin Wahoo Amendment 10, and John Hadley is the lead on that, and that has a lot of actions in it to revise the management measures for dolphin and wahoo, including updating the ACLs and things like that, and so this meeting was rather important for that amendment to move forward.

There is the joint commercial logbook amendment that John Carmichael is the lead on. I'm not exactly sure what is going on with that, and it's kind of in limbo, but it's there. We get updates about it at every council meeting or so, but it's always working. We are always working towards getting there with the commercial logbooks.

There is a bycatch reporting amendment that Chip is the lead on, and I think that's been put to the back burner, because there is too much going on, and we do have like a comprehensive recreational accountability measures amendment to try to sync everything up, because we have different accountability measures for different species, different FMPs, and so Brian is the lead on that, and we're trying to get everything all synced up so that things are fairly consistent across the South Atlantic.

Regulatory Amendment 33, Myra is the lead on that, and that's just looking at modifications to the red snapper fishing seasons. Some council members were asking, if they calculated a season -- Because, right now, if it's less than three days, if they say that the red snapper season is, then they don't open it, and so they're saying, well, can we open it if there is two days, or can we not have it be consecutive weekends, or can the weekends not be Friday, Saturday, Sunday, and what about -- Can we just have Saturdays and Sundays, or Fridays and Saturdays, and so they want to try to see if they can build in more flexibility in that, and so that's Regulatory Amendment 33. Then there is the ABC control rule amendment.

DR. SEDBERRY: Why does that have a question-mark on it?

DR. ERRIGO: I don't think it has an amendment number yet, or it has multiple numbers, because it's for multiple FMPs, and you all are very familiar with that. The timing on that has been slowed down, but it is still in the works and moving along, now that we have guidance from Headquarters on carryovers and paybacks, and hopefully things can begin moving again a little bit. That is everything that is going on so far, right now. These are the two living workgroups that are -- Well, the ABC Workgroup has now concluded, as of this meeting, but it was alive until today.

DR. SEDBERRY: Thank you for your service.

DR. ERRIGO: Hopefully we won't need it again for anything, but those are the members on that, and then there is the Ecopath/Ecosim Model Review Workgroup. Luiz was on that, but, given the number of people on it, I think we can simply remove him as one of the SSC workgroup members and be fine.

DR. SEDBERRY: I think that would be fine. Who ended up being chair of that workgroup?

DR. ERRIGO: They haven't selected a chair yet. When they have their meeting, their next meeting, they will have to select a chair, but they haven't done that yet.

DR. SEDBERRY: Okay. Is there any public comment on the council's workplan and our workgroup update? No public comment. Any comment from the committee or questions, clarifying questions, or comments? We have no specific action on this agenda item, and it just is what it is. Julia Byrd has something to say.

DR. ERRIGO: This is the other business.

DR. SEDBERRY: Okay, and so we are at Other Business, Item 13.

OTHER BUSINESS

MS. BYRD: Thanks, George. Hi, everyone. This will be very quick, but I am now the Citizen Science Program Coordinator, and we have one of our pilot projects that will be getting underway in the upcoming months that is called FISHstory, and what we're doing is we are kind of using historic recreational fishing photos from the 1940s, 1950s, 1960s, and early 1970s to try to collect information on species composition and get length estimates from those photos, to kind of fill in the data gap prior to when the fishery-dependent monitoring programs started.

To do this, for the species composition piece, we are loading all of these photos into an online crowdsourcing platform called Zooniverse, and so Zooniverse allows you to kind of build a project interface and develop kind of tutorials and trainings, so that members of the public can go in and help us try to identify the fish in these photos, and so, as part of this, we are putting together a validation team made up of fishermen and scientists, so that we can go back and check the citizen scientist species identifications.

I know that some people on the SSC have some species ID expertise, and, since we're looking for kind of a mix of fishermen and scientists, I wanted to see if anyone may be willing to serve on the validation team. I don't think it would be a large chunk of your time. We're kind of developing the review process now, but it will be -- You will be getting kind of emails with kind of photos, where we would be asking you to help identify the fish in the pictures.

We are planning to hold a webinar, just to train everybody on the review process and that sort of thing, and so I wanted to see if anyone might be willing to be on the validation team or may be willing to suggest other people that we could reach out to to be on the validation team, and so, again, I mean, I think it would be kind of mainly emails, where you would be asked to kind of validate photos over a length of time, weeks at a time, and so it wouldn't be something that would require a lot of time, and so I wanted to see if anyone might be willing to do that or connect me to other people who might be willing to do that.

DR. SEDBERRY: That sounds like fun. You can sign me up.

DR. LI: Not me, but I just would like to suggest one of my colleagues, Scott Smith from the Division, and he travels like worldwide to identify fish, and he's a good person to reach out to.

MS. BYRD: Awesome. Thank you, and I think Chip has already helped recruit him, and so we've got him on the list, and so thank you.

DR. SEDBERRY: I was going to suggest Scott Vansant.

DR. LANEY: Like Yan, I am not volunteering either, but it might be possible, Julia -- I am thinking about Dr. Chuck Manooch, who is retired and living in Morehead City, and Chuck may be willing to participate in this, and he certainly has the expertise.

MS. BYRD: Thanks, Wilson.

DR. LANEY: Does that mean that I need to contact Chuck and ask him, pave the way, so to speak?

MS. BYRD: Or if you would be willing to send kind of an introductory email and include me.

DR. LANEY: Certainly. I would be happy to do that.

MS. BYRD: Thank you, Wilson.

DR. SEDBERRY: Any other volunteers or suggestions from the committee?

DR. AHRENS: I could misidentify stuff.

DR. SEDBERRY: I am sure that Julia would take any suggestions via email, if something occurs to you as you are traveling home, and drop her a line.

MS. BYRD: Yes, please. Thank you, guys. I appreciate it.

DR. SEDBERRY: Thank you, Julia. I had, under Other Business, to remind everybody that we will have elections for the Chair and Vice Chair at our spring meeting, and, traditionally, the existing Vice Chair becomes the Chair, and we hold elections for the Vice Chair. Well, we hold elections for both, but, Rob, you need to be thinking about who you would like to be your Vice Chair, and, if any of you would like to talk to Rob about that, he's sitting right here. Anyway, that will occur at our April meeting, assuming it's April. We are honing-in on April, but that will be coming up soon. Is there any other Other Business?

DR. CROSSON: For that April meeting, are we going to try to do more than -- I mean, are we going to try to do an extra full day, or what's the plan, because it looked like -- From what I saw, it was definitely stacking up to be kind of a long meeting.

DR. ERRIGO: We're going to look into possibly extending it, depending on what we can do with the timing and how much is coming in, but we'll look into that, yes, having additional time, due to the amount of assessment review that's coming to you during that meeting. Otherwise, I think that will be it. You will just be reviewing assessments and then going home, which would be really unfortunate, and so --

DR. SEDBERRY: Any other Other Business? We need to take a photo, but that requires us to leave the table. Let's not leave the table yet, because we'll never get back, but we will do it. We will do it, but thanks for the reminder. We have one more opportunity for public comment, and I will check again and see if there is any public that would like to comment on anything that we have discussed this week.

Then Agenda Item 15 is Consensus Statements and Recommendations Review. We have kind of kept on top of that as we've gone along this week, and everybody has been really good at drafting concise statements, and I don't think we've had any consensus statements, but we have had some summary and recommendation statements that we reviewed at the end of each day. I don't feel the need to go back through them at this point, and I think we can do that in writing when we review the report, if that's okay with everybody. Okay.

MR. CARMICHAEL: George, one follow-up of, Fred, what you and I talked about yesterday. Fred and I talked some yesterday at the end about the red snapper assessment. He suggested that it would be good to try and encourage bringing in some outside expertise, through the data and

assessment workshops that are planned and to also consider how to maybe do a little more robust review than just the here at the meeting, and maybe bring in an outside reviewer or something, and so if the committee thinks that's a pretty good idea of something we can fold into the plans, and we have a couple of years to work out all the details.

DR. SERCHUK: If I could expound a little bit on that, Chair. I think, because this was originally scheduled to be a research track, and the difference -- One of the largest differences between a research track and the other forms of assessments that the SSC and council have is the amount of peer review, external peer review, that goes on.

Red snapper is, in my mind, and I think most of you would agree, a very high-profile species in this region, and I am -- It would legitimize, in my mind, to a greater extent, if there were some external reviews that were brought in apart from the SSC members, and I have seen this in other forums, and it gives much more legitimacy to the scientific process, and I think it would be additionally helpful to bring the external reviewers in during the data reviews and during the actual development of the assessment.

I say that because, when I have seen external reviewers come in at the end of the process, they have often given the following comment, that, well, at this point, it's generally up or down, in terms of accepting or rejecting the assessment, and I wish you had brought me in earlier, where perhaps I could have provided more expertise, either in terms of datasets or in frameworks or in protocols, and so I am thinking that, because it was originally scheduled as a research track assessment, in which that sort of expertise would have been brought in, and now it's not going to be that, but, because it's such a high-profile species, it seems to me that the whole process would be best served if there were some additional internal experts brought in, with no relationship to this SSC, in the two steps of the process that typically occur, and that is review of the data inputs and then the development of the framework for doing the assessment. Thank you.

DR. SEDBERRY: Can you say that again, Fred? When do you see that this would happen, these experts?

DR. SERCHUK: Typically, as I understand it, the SSC typically gets involved in the development of the assessment process, and we have SSC members that develop it in the data workshops, and then we have SSC members in terms of the assessment and the development of the assessment reviews. I am suggesting that, in addition to the SSC involvement, that there be external experts brought in at both of those stages, or whatever stages are needed, to give legitimacy to the process, much more scientific legitimacy to the process.

MR. CARMICHAEL: But I don't think we're saying conduct their own external review. We want them to be participants and to contribute to the process, and so I don't think you need that parenthetical there after the comma.

DR. SEDBERRY: These workshops that you're talking about, these are the SEDAR workshops? Let's put that word in there too, because that's confusing to me.

DR. ERRIGO: This is under the scope of work for the red snapper assessment, but that's fine.

MR. CARMICHAEL: This would go in the process text that's in the scope of work now, and so it would be reviewed by the council and reviewed by the Science Center, and we'll have a chance at the Steering Committee to talk about how to make this happen.

DR. SHAROV: It is, in general, a good recommendation that you certainly would probably want to apply to any species, but is there an expectation that there are certain experts outside of this group and the Science Center staff that will bring this additional expertise, and, in particular, new data or data interpretation? I mean, as a general statement, absolutely that's the right thing to do, but I am just curious whether there is an expectation that we know of that there is somebody or something that is likely to improve the assessment.

DR. SEDBERRY: I understand your question, and it seems to me like all the experts are already going to be there. No?

MR. CARMICHAEL: I mean, you have the Gulf assessment of red snapper that's done, and it's pretty much entirely different people that have participated in this one, and that would be some red snapper expertise, and you have folks on the Gulf SSC that work on the states and in the universities around the Gulf that might have expertise, and we may be able to compel one of them to come, and then I think we would ask maybe the Science Center to look towards some other Science Centers, if they could bring in someone, and so I think we can find some folks, and my thought would be that you want someone with kind of red snapper expertise and then maybe someone with broader assessment expertise.

DR. SEDBERRY: Thanks, John.

DR. BUCKEL: When Fred was talking, I was thinking of the CIE reviewers, that you were saying that those were the ones that were saying that they wished they could be brought in earlier, and so that's what I was thinking, and I like the red snapper biologists from other regions, but were you thinking of maybe one of the CIE reviewers that would be there throughout the process?

DR. SERCHUK: I guess I was saying that we have a research track, and that research track does bring in external experts, and so I'm just saying that I think it would enhance the legitimacy of the red snapper assessment if we could bring in some external expertise, and that's all.

DR. SEDBERRY: Okay, and so we have added to our recommendations under red snapper to reflect what we have just discussed. Is everybody on the SSC agreeable to what we have written up there now as our recommendations?

DR. SCHUELLER: I am wondering if we want to be a little more specific about external experts, because I like what John said, and I am not -- I don't think that CIE is necessarily suited to be like a panel member contributing over the full assessment webinars or whatever it would be, because of the constraints of the way it's defined, and so I don't want to get onto some bus where we're trying to get a CIE specifically, because there's been times where there has been desk reviews at the last minute, and then things have been changed, and they just haven't been as effective, and I think, the way that John has outlined it, it's more effective, and we should be a little more specific.

DR. SEDBERRY: That's a good idea, and so we can suggest what their expertise should be, or what their experience should be, and let's see what we've got going here. Experts with red snapper expertise and general stock assessment.

DR. NESSLAGE: General stock assessment is fine, but I think the big challenge, given the scope of work that we saw, is going to be converting the information from the trap index into something that is actually age-specific selectivity that will be informative for that assessment in an appropriate way, and so I would target someone who is on the cutting edge of modeling and identifying new ways to incorporate data to inform selectivity information in the stock assessments, and I think that's really what's needed here.

DR. SEDBERRY: I hate to add any specific expertise though after we're not all in the same room. Let's make sure that we agree with what we're putting up here. Does that sound good to everybody? I see lots of nods. Very good. We can wordsmith this a little bit, but we will have those key words in there.

MR. CARMICHAEL: Were you going to talk more about the next meeting, while I'm here?

DR. SEDBERRY: That is the next agenda item, I believe, the next meetings.

NEXT MEETING

MR. CARMICHAEL: I have had some communication with the Gulf, and I'm sorry to report that the waters are nearly as murky as they were yesterday about trying to find a time that works for this. The Gulf had thought April 20 to 24 would be a good time, and I don't think they were aware of the NSAW, and I don't know how that -- It probably doesn't affect yellowtail, but it probably affects like Jeff Isely, who I think is doing their Gulf cobia, and I am not sure -- It certainly affects some of their SSC people, a few, and so I think they're looking into that.

Another thought was May 18th and 19th, and it would be early in that week, because there's a SEDAR Steering Committee on the 20th and 21st, and so I think that one would work for us, regardless of our meeting schedule. They also suggested May 4th through 8th, and the issue, obviously, with the 20th and 24th and 24th through 28th is both are on either side of our most likely time to have our April meeting, which is the 28th to 30th.

We will need to work with them some more, and I think the council will have to consider about maybe just holding one meeting in another location in the region, and I don't know if they're going to want to hold our entire meeting in Tampa, given all the stock assessments, and that certainly has an impact for the other assessment people, and so we're not sure how to best accommodate this. We may not be able to avoid some travel the week after, but bear in mind that it would be a day, probably a morning or afternoon, where the assessment was discussed, and maybe, for people that aren't too far away, it may be a day trip. For others, it would be like one night.

That's what we're balancing right now, and we'll talk some more with the council about it, and we'll keep in touch with the Gulf and keep you posted, and so we have your preferred week for our regular South Atlantic Council SSC being the April 28th to 30th.

DR. SEDBERRY: Any questions or discussion of that? So we're aiming for April 28th to 30th.

DR. ERRIGO: There is also these two fall dates, if anyone has a preference for these weeks, or if one week is bad for someone, and, if you can't answer now, if you want to send me an email that says this week is really bad, or this week is really bad, and then we'll try to work it out, but, if someone knows right off that one of these weeks is good or bad, let me know. That's for the October meeting.

DR. SHAROV: Just real quick, just a few minutes earlier, we discussed that the possible workload would be larger than usual, and there would be extra days, and so should we sort of consider the potential meeting range of the 28th through 30th could be extended by a day on either of the sides of this timeframe?

DR. ERRIGO: More than likely, I probably would go back to the 27th, unless someone is really -- If that can't work, but, if I go forward to the 1st, and that's much better, and I can do that.

DR. SEDBERRY: Okay. So we're leaning towards that October 13th to 15th of 2020 for our meeting a year from now, subject to change.

DR. SERCHUK: I will check to see whether any other SSCs are meeting that week, and I say that, Chair, because, this week, the New England SSC is meeting today and tomorrow, and, unfortunately, I'm in the position where I can't be in two places at once, and so I'm with the people that I want to be with, but, if we can avoid a conflict, Chair, I would appreciate it. Thank you.

DR. SEDBERRY: Thanks, Fred. Any other comments regarding meeting times, SSC meeting times? We have council meetings coming up in Wilmington this year and then Jekyll Island, Key West, Charleston, and Wrightsville Beach next year. They're all at the usual times, right, the first week of the month. Okay. Don't leave yet, because we're going to have our picture taken, and this will only take a minute, but, before we adjourn to picture taking, I just want to thank everybody again for your travel and taking time out to do this and taking time out to prepare for it and all your input, and you will be getting a draft of the report as soon as Mike and I can put it together.

I don't have a timeline for that right now. My brain is too muddy to come up with it, but it will be in the next few days. It will be early next week sometime that we will get a draft out to you, and there will be a turnaround, maybe a week turnaround, time to get it back to us, so that we can revise it in time to get it into the briefing book for the December council meeting. With that, if there's nothing else, we are adjourned.

(Whereupon, the meeting adjourned on October 17, 2019.)

- - -

Certified By: _____ Date: _____

Attachment 1: SSC April 2020 Meeting

Transcribed By:
Amanda Thomas
November 14, 2019

10/15

SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

2019 COUNCIL MEMBERS

✓ Jessica McCawley, **Chair**
Florida Fish and Wildlife Conservation Commission
2590 Executive Center Circle E. Suite 201
Tallahassee, FL 32301
(850)487-0554 (ph); (850)487-4847 (f)
Jessica.mccawley@myfwc.com

✓Mel Bell, **Vice Chair**
SCDNR-Marine Resources Division
P.O. Box 12559
217 Ft. Johnson Road
Charleston, SC 29422
(843)953-9007 (ph); (843)953-9159 (fax)
bellm@dnr.sc.gov

Robert Beal
Executive Director
Atlantic States Marine Fisheries Commission
1050 N. Highland St. Suite 200 A-N
Arlington, VA 22201
(703)842-0740 (ph); (703)842-0741 (f)
rbeal@asmfc.org

Anna Beckwith
1907 Paulette Road
Morehead City, NC 28557
(252)671-3474 (ph)
AnnaBarriosBeckwith@gmail.com

Dr. Carolyn Belcher
GA DNR – Coastal Resources Division
One Conservation Way, Suite 300
Brunswick, GA 31520
(912)264-7218 (ph); (912)262-3143 (f)
belchersafmc@gmail.com

Chester Brewer
250 Australian Ave. South Suite 1400
West Palm Beach, FL 33408
(561)655-4777 (ph)
wcbsafmc@gmail.com

Dr. Kyle Christiansen
150 Cedar St.
Richmond Hill, GA 31324
(912)756-7560 (ph)
christiansensafmc@gmail.com

Chris Conklin
P.O. Box 972
Murrells Inlet, SC 29576
(843)543-3833
conklinsafmc@gmail.com

Dr. Roy Crabtree
Regional Administrator
NOAA Fisheries, Southeast Region
263 13th Avenue South
St. Petersburg, FL 33701
(727)824-5301 (ph); (727)824-5320 (f)
roy.crabtree@noaa.gov

Tim Griner
4446 Woodlark Lane
Charlotte, NC 28211
(980)722-0918 (ph)
timgrinersafmc@gmail.com

U.S. Fish and Wildlife Service
Representative
TBD

LCDR Jeremy Montes
U.S. Coast Guard
909 SE 1st Ave.
Miami, FL 33131
(305)415-6788(ph); (305)710-4569(c)
Jeremy.J.Montes@uscg.mil

✓Stephen Poland
NC Division of Marine Fisheries
PO Box 769
3441 Arendell Street
Morehead City, NC 28557
(252)808-8011 (direct); (252)726-7021 (main)
Steve.Poland@ncdenr.gov

Art Sapp
2270 NE 25th St.
Lighthouse Pointe, FL 33064
(954)444-0820 (ph)
artsappsafmc@gmail.com

SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

2019 COUNCIL MEMBERS continued

Deirdre Warner-Kramer
Office of Marine Conservation OES/OMC
2201 C Street, N.W. Department of State, Room 5806
Washington, DC 20520
(202)647-3228 (ph)
Warner-KramerDM@state.gov

David Whitaker
720 Tennent Street
Charleston, SC 29412
(843)953-9392
david.whitakersafmc@gmail.com

Spud Woodward
860 Buck Swamp Road
Brunswick, GA 31523
(912)258-8970 (ph)
swoodwardsafmc@gmail.com

SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

COUNCIL STAFF

Executive Director
√Gregg T. Waugh
gregg.waugh@safmc.net

Deputy Director – Science & Statistics
√John Carmichael
john.carmichael@safmc.net

Deputy Director - Management
✓ Dr. Brian Cheuvront
brian.cheuvront@safmc.net

Fishery Scientist
✓Myra Brouwer
myra.brouwer@safmc.net

Citizen Science Program Manager
✓Julia Byrd
julia.byrd@safmc.net

Admin. Secretary/Travel Coordinator
Cindy Chaya
cindy.chaya@safmc.net

Fishery Scientist
✓Dr. Chip Collier
chip.collier@safmc.net

Purchasing & Grants
√Cierra Graham
cierra.graham@safmc.net

Fishery Biologist
√Dr. Mike Errigo
mike.errigo@safmc.net

Fishery Economist
✓John Hadley
john.hadley@safmc.net

Public Information Officer
Kim Iverson
kim.iverson@safmc.net

Administrative Officer
Kelly Klasnick
kelly.klasnick@safmc.net

Senior Fishery Biologist
Roger Pugliese
roger.pugliese@safmc.net

Outreach Program Coordinator
✓ Cameron Rhodes
cameron.rhodes@safmc.net

Staff Accountant
Suzanna Thomas
suzanna.thomas@safmc.net

Fisheries Social Scientist
Christina Wiegand
christina.wiegand@safmc.net

Outreach Specialist
BeBe Harrison
bebe.harrison@safmc.net

Outreach Specialist
Allie Iberle
allie.iberle@safmc.net

SEDAR Coordinators

Dr. Julie Neer
julie.neer@safmc.net

√Kathleen Howington
kathleen.howington@safmc.net

SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

SCIENTIFIC AND STATISTICAL COMMITTEE

✓Dr. George Sedberry, Chair
6 Sorghum Lane
Savannah, GA 31411
George.sedberry@gmail.com
6/10*, 6/13*, 6/16*, 6/19*

✓Dr. Robert Ahrens, Vice Chair
University of Florida
135 Newins-Ziegler Hall
Gainesville, FL 32611
(352)273-3630 (ph)
rahrens@ufl.edu
6/16*, 6/19*

Dr. Luiz Barbieri
FL FWCC/FMRI
100 Eighth Avenue SE
St. Petersburg, FL 33701
(727)896-8626 ext. 4920 (ph)
luiz.barbieri@fwc.state.fl.us
3/08*, 6/10*, 6/13*, 6/16*,
6/19*

GADNR Representative TBD

✓Dr. Jeffrey Buckel
North Carolina State University-Center for Marine Science and Technology
Department of Zoology
303 College Circle
Morehead City, NC 28557
(252)222-6341(ph); (252)222-6311(f)
jeffrey_buckel@ncsu.edu
9/05*,3/08*,6/10*,
6/13*,6/16*, 6/19*

✓Dr. Scott Crosson
NMFS SEFSC
75 Virginia Beach Drive
Miami, FL 33149
(305)361-4468
Scott.Crosson@noaa.gov
6/09*, 6/17*

Dr. Chris Dumas
University of NC-Wilmington
Dept. of Environmental Studies
601 South College Rd.
Wilmington, NC 28403
(910)962-4026(ph)
dumasc@uncw.edu
6/18*

✓Dr. Churchill Grimes
211 Moriah Creek Road
Crawfordville, FL 32327
(831)713-6543
churchill.grimes@gmail.com
6/10*, 6/13*, 6/16*, 6/19*

✓Dr. Eric Johnson
Department of Biology University of North Florida
1 UNF Drive
Jacksonville, FL 32224
(904)620-5764
eric.johnson@unf.edu
6/10*, 6/11*, 6/14*, 6/17*

✓Anne Lange
1493 Diamond Blvd
Mt Pleasant, SC 29466
(843)971-0628 (ph)
AMLange@aol.com
3/08*, 6/11*,6/14*, 6/17*

✓Dr. Wilson Laney
Dept. of Applied Ecology
NC State University – Campus Box 7617
Raleigh, NC 27695-7617
(919)515-5019 (O); (252)339-5717 (C)
rallaneys@gmail.com
6/19*

✓Dr. Yan Li
NC Division of Marine Fisheries
Dept. of Environmental Quality
P.O. Box 769
3441 Arendell St.
Morehead City, NC 28557
(540)808-8373 (ph)
yan.li@ncdenr.gov
6/18*

SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

SCIENTIFIC AND STATISTICAL COMMITTEE continued

✓Dr. Genny Nesslage
Chesapeake Biological Laboratory
P.O. Box 38
146 Williams Street
Solomons, MD 20688
(410)326-7223 (ph)
nesslage@umces.e
du 6/16*, 6/19*

✓Dr. Marcel Reichert
SC DNR/Marine Resources Division
PO Box 12559
217 Ft. Johnson Road
Charleston, SC 29412
(843)953-5778 (ph)
ReichertM@dnr.sc.gov
3/08*, 6/11, 6/14*, 6/17*

Dr. Frederick Scharf
University of North Carolina Wilmington
Department of Biology and Marine Biology
601 South College Rd
Wilmington, NC 28403
scharff@uncw.edu
6/17*

✓Dr. Amy Schueller
NOAA Fisheries
SEFSC Beaufort Laboratory
101 Pivers Island Road
Beaufort, NC 28516
(252)838-0815 (ph)
Amy.Schueller@noaa.gov
6/14*, 6/17*

✓Dr. Fred Serchuk
Casa Bonita 1,
26000 Hickory Blvd. Unit 704
Bonita Springs, FL 34134
(774)392-4975 (ph)
fred.serchuk@gmail.com
6/15*

✓Dr. Alexei Sharov
Maryland Dept. of Natural Resources
508 Taylor Avenue
Annapolis, MD 21401
(410)260-8288 (ph)
ASHAROV@dnr.state.md.us
6/15*

Dr. Tracy Yandle
Emory University-Mathematics and Science Center
Dept. of Environmental Studies
400 Dowman Dr.
Atlanta, GA 30322
(404)727-6314 (ph); (404)727-4448 (f)
tyandle@emory.edu
6/11*, 6/14*, 6/17*

Dr. Jared Flowers

Enka Burgess

SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

2019 COUNCIL MEMBERS

Jessica McCawley, **Chair**
Florida Fish and Wildlife Conservation Commission
2590 Executive Center Circle E. Suite 201
Tallahassee, FL 32301
(850)487-0554 (ph); (850)487-4847 (f)
Jessica.mccawley@myfwc.com

Mel Bell, **Vice Chair**
SCDNR-Marine Resources Division
P.O. Box 12559
217 Ft. Johnson Road
Charleston, SC 29422
(843)953-9007 (ph); (843)953-9159 (fax)
bellm@dnr.sc.gov

Robert Beal
Executive Director
Atlantic States Marine Fisheries Commission
1050 N. Highland St. Suite 200 A-N
Arlington, VA 22201
(703)842-0740 (ph); (703)842-0741 (f)
rbeal@asmfc.org

Anna Beckwith
1907 Paulette Road
Morehead City, NC 28557
(252)671-3474 (ph)
AnnaBarriosBeckwith@gmail.com

Dr. Carolyn Belcher
GA DNR – Coastal Resources Division
One Conservation Way, Suite 300
Brunswick, GA 31520
(912)264-7218 (ph); (912)262-3143 (f)
belchersafmc@gmail.com

Chester Brewer
250 Australian Ave. South Suite 1400
West Palm Beach, FL 33408
(561)655-4777 (ph)
wcbsafmc@gmail.com

Dr. Kyle Christiansen
150 Cedar St.
Richmond Hill, GA 31324
(912)756-7560 (ph)
christiansensafmc@gmail.com

Chris Conklin
P.O. Box 972
Murrells Inlet, SC 29576
(843)543-3833
conklinsafmc@gmail.com

Dr. Roy Crabtree
Regional Administrator
NOAA Fisheries, Southeast Region
263 13th Avenue South
St. Petersburg, FL 33701
(727)824-5301 (ph); (727)824-5320 (f)
roy.crabtree@noaa.gov

Tim Griner
4446 Woodlark Lane
Charlotte, NC 28211
(980)722-0918 (ph)
timgrinersafmc@gmail.com

U.S. Fish and Wildlife Service
Representative
TBD

LCDR Jeremy Montes
U.S. Coast Guard
909 SE 1st Ave.
Miami, FL 33131
(305)415-6788(ph); (305)710-4569(c)
Jeremy.J.Montes@uscg.mil

Stephen Poland
NC Division of Marine Fisheries
PO Box 769
3441 Arendell Street
Morehead City, NC 28557
(252)808-8011 (direct); (252)726-7021 (main)
Steve.Poland@ncdenr.gov

Art Sapp
2270 NE 25th St.
Lighthouse Pointe, FL 33064
(954)444-0820 (ph)
artsappsafmc@gmail.com

SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

2019 COUNCIL MEMBERS continued

Deirdre Warner-Kramer
Office of Marine Conservation OES/OMC
2201 C Street, N.W. Department of State, Room 5806
Washington, DC 20520
(202)647-3228 (ph)
Warner-KramerDM@state.gov

David Whitaker
720 Tennent Street
Charleston, SC 29412
(843)953-9392
david.whitakersafmc@gmail.com

Spud Woodward
860 Buck Swamp Road
Brunswick, GA 31523
(912)258-8970 (ph)
swoodwardsafmc@gmail.com

SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

COUNCIL STAFF

Executive Director
Gregg T. Waugh
gregg.waugh@safmc.net

Deputy Director – Science & Statistics
John Carmichael
john.carmichael@safmc.net

Deputy Director - Management
Dr. Brian Cheuvront
brian.cheuvront@safmc.net

Fishery Scientist
Myra Brouwer
myra.brouwer@safmc.net

Citizen Science Program Manager
Julia Byrd
julia.byrd@safmc.net

Admin. Secretary/Travel Coordinator
Cindy Chaya
cindy.chaya@safmc.net

Fishery Scientist
Dr. Chip Collier
chip.collier@safmc.net

Purchasing & Grants
Cierra Graham
cierra.graham@safmc.net

Fishery Biologist
Dr. Mike Errigo
mike.errigo@safmc.net

Fishery Economist
John Hadley
john.hadley@safmc.net

Public Information Officer
Kim Iverson
kim.iverson@safmc.net

Administrative Officer
Kelly Klasnick
kelly.klasnick@safmc.net

Senior Fishery Biologist
Roger Pugliese
roger.pugliese@safmc.net

Outreach Program Coordinator
Cameron Rhodes
cameron.rhodes@safmc.net

Staff Accountant
Suzanna Thomas
suzanna.thomas@safmc.net

Fisheries Social Scientist
Christina Wiegand
christina.wiegand@safmc.net

Outreach Specialist
BeBe Harrison
bebe.harrison@safmc.net

Outreach Specialist
Allie Iberle
allie.iberle@safmc.net

SEDAR Coordinators

Dr. Julie Neer
julie.neer@safmc.net

Kathleen Howington
kathleen.howington@safmc.net

SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

SCIENTIFIC AND STATISTICAL COMMITTEE

✓Dr. George Sedberry, Chair
6 Sorghum Lane
Savannah, GA 31411
George.sedberry@gmail.com
6/10*, 6/13*, 6/16*, 6/19*

✓Dr. Robert Ahrens, Vice Chair
University of Florida
135 Newins-Ziegler Hall
Gainesville, FL 32611
(352)273-3630 (ph)
rahrens@ufl.edu
6/16*, 6/19*

Dr. Luiz Barbieri
FL FWCC/FMRI
100 Eighth Avenue SE
St. Petersburg, FL 33701
(727)896-8626 ext. 4920 (ph)
luiz.barbieri@fwc.state.fl.us
3/08*, 6/10*, 6/13*, 6/16*,
6/19*

GADNR Representative TBD

✓Dr. Jeffrey Buckel
North Carolina State University-Center for Marine Science and Technology
Department of Zoology
303 College Circle
Morehead City, NC 28557
(252)222-6341(ph); (252)222-6311(f)
jeffrey_buckel@ncsu.edu
9/05*,3/08*,6/10*,
6/13*,6/16*, 6/19*

✓Dr. Scott Crosson
NMFS SEFSC
75 Virginia Beach Drive
Miami, FL 33149
(305)361-4468
Scott.Crosson@noaa.gov
6/09*, 6/17*

✓ Dr. Chris Dumas
University of NC-Wilmington
Dept. of Environmental Studies
601 South College Rd.
Wilmington, NC 28403
(910)962-4026(ph)
dumasc@uncw.edu
6/18*

✓ Dr. Churchill Grimes
211 Moriah Creek Road
Crawfordville, FL 32327
(831)713-6543
churchill.grimes@gmail.com
6/10*, 6/13*, 6/16*, 6/19*

✓ Dr. Eric Johnson
Department of Biology University of North Florida
1 UNF Drive
Jacksonville, FL 32224
(904)620-5764
eric.johnson@unf.edu
6/10*, 6/11*, 6/14*, 6/17*

✓Anne Lange
1493 Diamond Blvd
Mt Pleasant, SC 29466
(843)971-0628 (ph)
AMLange@aol.com
3/08*, 6/11*,6/14*, 6/17*

✓ Dr. Wilson Laney
Dept. of Applied Ecology
NC State University – Campus Box 7617
Raleigh, NC 27695-7617
(919)515-5019 (O); (252)339-5717 (C)
rallaneys@gmail.com
6/19*

✓Dr. Yan Li
NC Division of Marine Fisheries
Dept. of Environmental Quality
P.O. Box 769
3441 Arendell St.
Morehead City, NC 28557
(540)808-8373 (ph)
yan.li@ncdenr.gov
6/18*

SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

SCIENTIFIC AND STATISTICAL COMMITTEE continued

✓Dr. Genny Nesslage
Chesapeake Biological Laboratory
P.O. Box 38
146 Williams Street
Solomons, MD 20688
(410)326-7223 (ph)
nesslage@umces.e
du 6/16*, 6/19*

Dr. Marcel Reichert
SC DNR/Marine Resources Division
PO Box 12559
217 Ft. Johnson Road
Charleston, SC 29412
(843)953-5778 (ph)
ReichertM@dnr.sc.gov
3/08*, 6/11, 6/14*, 6/17*

✓Dr. Frederick Scharf
University of North Carolina Wilmington
Department of Biology and Marine Biology
601 South College Rd
Wilmington, NC 28403
scharff@uncw.edu
6/17*

✓Dr. Amy Schueller
NOAA Fisheries
SEFSC Beaufort Laboratory
101 Pivers Island Road
Beaufort, NC 28516
(252)838-0815 (ph)
Amy.Schueller@noaa.gov
6/14*, 6/17*

✓Dr. Fred Serchuk
Casa Bonita 1,
26000 Hickory Blvd. Unit 704
Bonita Springs, FL 34134
(774)392-4975 (ph)
fred.serchuk@gmail.com
6/15*

✓Dr. Alexei Sharov
Maryland Dept. of Natural Resources
508 Taylor Avenue
Annapolis, MD 21401
(410)260-8288 (ph)
ASHAROV@dnr.state.md.us
6/15*

Dr. Tracy Yandle
Emory University-Mathematics and Science Center
Dept. of Environmental Studies
400 Dowman Dr.
Atlanta, GA 30322
(404)727-6314 (ph); (404)727-4448 (f)
tyandle@emory.edu
6/11*, 6/14*, 6/17*

Erika Burgess
Lauren Gentry
Luke McEachron
Dr. Jared Flowers

Attachment 1: SSC April 2020 Meeting

SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

2019 COUNCIL MEMBERS

Jessica McCawley, **Chair**
Florida Fish and Wildlife Conservation Commission
2590 Executive Center Circle E. Suite 201
Tallahassee, FL 32301
(850)487-0554 (ph); (850)487-4847 (f)
Jessica.mccawley@myfwc.com

✓Mel Bell, **Vice Chair**
SCDNR-Marine Resources Division
P.O. Box 12559
217 Ft. Johnson Road
Charleston, SC 29422
(843)953-9007 (ph); (843)953-9159 (fax)
bellm@dnr.sc.gov

Robert Beal
Executive Director
Atlantic States Marine Fisheries Commission
1050 N. Highland St. Suite 200 A-N
Arlington, VA 22201
(703)842-0740 (ph); (703)842-0741 (f)
rbeal@asmfc.org

Anna Beckwith
1907 Paulette Road
Morehead City, NC 28557
(252)671-3474 (ph)
AnnaBarriosBeckwith@gmail.com

Dr. Carolyn Belcher
GA DNR – Coastal Resources Division
One Conservation Way, Suite 300
Brunswick, GA 31520
(912)264-7218 (ph); (912)262-3143 (f)
belchersafmc@gmail.com

Chester Brewer
250 Australian Ave. South Suite 1400
West Palm Beach, FL 33408
(561)655-4777 (ph)
wcbsafmc@gmail.com

Dr. Kyle Christiansen
150 Cedar St.
Richmond Hill, GA 31324
(912)756-7560 (ph)
christiansensafmc@gmail.com

Chris Conklin
P.O. Box 972
Murrells Inlet, SC 29576
(843)543-3833
conklinsafmc@gmail.com

Dr. Roy Crabtree
Regional Administrator
NOAA Fisheries, Southeast Region
263 13th Avenue South
St. Petersburg, FL 33701
(727)824-5301 (ph); (727)824-5320 (f)
roy.crabtree@noaa.gov

Tim Griner
4446 Woodlark Lane
Charlotte, NC 28211
(980)722-0918 (ph)
timgrinersafmc@gmail.com

U.S. Fish and Wildlife Service
Representative
TBD

LCDR Jeremy Montes
U.S. Coast Guard
909 SE 1st Ave.
Miami, FL 33131
(305)415-6788(ph); (305)710-4569(c)
Jeremy.J.Montes@uscg.mil

✓Stephen Poland
NC Division of Marine Fisheries
PO Box 769
3441 Arendell Street
Morehead City, NC 28557
(252)808-8011 (direct); (252)726-7021 (main)
Steve.Poland@ncdenr.gov

Art Sapp
2270 NE 25th St.
Lighthouse Pointe, FL 33064
(954)444-0820 (ph)
artsappsafmc@gmail.com

SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

2019 COUNCIL MEMBERS continued

Deirdre Warner-Kramer
Office of Marine Conservation OES/OMC
2201 C Street, N.W. Department of State, Room 5806
Washington, DC 20520
(202)647-3228 (ph)
Warner-KramerDM@state.gov

David Whitaker
720 Tennent Street
Charleston, SC 29412
(843)953-9392
david.whitakersafmc@gmail.com

Spud Woodward
860 Buck Swamp Road
Brunswick, GA 31523
(912)258-8970 (ph)
swoodwardsafmc@gmail.com

SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

COUNCIL STAFF

Executive Director
Gregg T. Waugh
gregg.waugh@safmc.net

Deputy Director – Science & Statistics
✓ John Carmichael
john.carmichael@safmc.net

Deputy Director - Management
✓ Dr. Brian Cheuvront
brian.cheuvront@safmc.net

Fishery Scientist
✓Myra Brouwer
myra.brouwer@safmc.net

Citizen Science Program Manager
✓Julia Byrd
julia.byrd@safmc.net

Admin. Secretary/Travel Coordinator
Cindy Chaya
cindy.chaya@safmc.net

Fishery Scientist
✓Dr. Chip Collier
chip.collier@safmc.net

Purchasing & Grants
✓Cierra Graham
cierra.graham@safmc.net

Fishery Biologist
✓Dr. Mike Errigo
mike.errigo@safmc.net

Fishery Economist
✓John Hadley
john.hadley@safmc.net

Public Information Officer
Kim Iverson
kim.iverson@safmc.net

Administrative Officer
Kelly Klasnick
kelly.klasnick@safmc.net

Senior Fishery Biologist
✓Roger Pugliese
roger.pugliese@safmc.net

Outreach Program Coordinator
✓Cameron Rhodes
cameron.rhodes@safmc.net

Staff Accountant
Suzanna Thomas
suzanna.thomas@safmc.net

Fisheries Social Scientist
Christina Wiegand
christina.wiegand@safmc.net

Outreach Specialist
BeBe Harrison
bebe.harrison@safmc.net

Outreach Specialist
Allie Iberle
allie.iberle@safmc.net

SEDAR Coordinators

Dr. Julie Neer
julie.neer@safmc.net

✓Kathleen Howington
kathleen.howington@safmc.net

SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

SCIENTIFIC AND STATISTICAL COMMITTEE

✓Dr. George Sedberry, Chair
6 Sorghum Lane
Savannah, GA 31411
George.sedberry@gmail.com
6/10*, 6/13*, 6/16*, 6/19*

✓Dr. Robert Ahrens, Vice Chair
University of Florida
135 Newins-Ziegler Hall
Gainesville, FL 32611
(352)273-3630 (ph)
rahrens@ufl.edu
6/16*, 6/19*

Dr. Luiz Barbieri
FL FWCC/FMRI
100 Eighth Avenue SE
St. Petersburg, FL 33701
(727)896-8626 ext. 4920 (ph)
luiz.barbieri@fwc.state.fl.us
3/08*, 6/10*, 6/13*, 6/16*,
6/19*

GADNR Representative TBD

✓Dr. Jeffrey Buckel
North Carolina State University-Center for Marine Science and Technology
Department of Zoology
303 College Circle
Morehead City, NC 28557
(252)222-6341(ph); (252)222-6311(f)
jeffrey_buckel@ncsu.edu
9/05*,3/08*,6/10*,
6/13*,6/16*, 6/19*

✓Dr. Scott Crosson
NMFS SEFSC
75 Virginia Beach Drive
Miami, FL 33149
(305)361-4468
Scott.Crosson@noaa.gov
6/09*, 6/17*

Dr. Chris Dumas
University of NC-Wilmington
Dept. of Environmental Studies
601 South College Rd.
Wilmington, NC 28403
(910)962-4026(ph)
dumasc@uncw.edu
6/18*

✓Dr. Churchill Grimes
211 Moriah Creek Road
Crawfordville, FL 32327
(831)713-6543
churchill.grimes@gmail.com
6/10*, 6/13*, 6/16*, 6/19*

✓Dr. Eric Johnson
Department of Biology University of North Florida
1 UNF Drive
Jacksonville, FL 32224
(904)620-5764
eric.johnson@unf.edu
6/10*, 6/11*, 6/14*, 6/17*

✓Anne Lange
1493 Diamond Blvd
Mt Pleasant, SC 29466
(843)971-0628 (ph)
AMLange@aol.com
3/08*, 6/11*,6/14*, 6/17*

✓Dr. Wilson Laney
Dept. of Applied Ecology
NC State University – Campus Box 7617
Raleigh, NC 27695-7617
(919)515-5019 (O); (252)339-5717 (C)
rallaneys@gmail.com
6/19*

✓Dr. Yan Li
NC Division of Marine Fisheries
Dept. of Environmental Quality
P.O. Box 769
3441 Arendell St.
Morehead City, NC 28557
(540)808-8373 (ph)
yan.li@ncdenr.gov
6/18*

SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

SCIENTIFIC AND STATISTICAL COMMITTEE continued

✓ Dr. Genny Nesslage
Chesapeake Biological Laboratory
P.O. Box 38
146 Williams Street
Solomons, MD 20688
(410)326-7223 (ph)
nesslage@umces.e
du 6/16*, 6/19*

Dr. Marcel Reichert
SC DNR/Marine Resources Division
PO Box 12559
217 Ft. Johnson Road
Charleston, SC 29412
(843)953-5778 (ph)
ReichertM@dnr.sc.gov
3/08*, 6/11, 6/14*, 6/17*

✓Dr. Frederick Scharf
University of North Carolina Wilmington
Department of Biology and Marine Biology
601 South College Rd
Wilmington, NC 28403
scharff@uncw.edu
6/17*

✓Dr. Amy Schueller
NOAA Fisheries
SEFSC Beaufort Laboratory
101 Pivers Island Road
Beaufort, NC 28516
(252)838-0815 (ph)
Amy.Schueller@noaa.gov
6/14*, 6/17*

✓Dr. Fred Serchuk
Casa Bonita 1,
26000 Hickory Blvd. Unit 704
Bonita Springs, FL 34134
(774)392-4975 (ph)
fred.serchuk@gmail.com
6/15*

✓Dr. Alexei Sharov
Maryland Dept. of Natural Resources
508 Taylor Avenue
Annapolis, MD 21401
(410)260-8288 (ph)
ASHAROV@dnr.state.md.us
6/15*

Dr. Tracy Yandle
Emory University-Mathematics and Science Center
Dept. of Environmental Studies
400 Dowman Dr.
Atlanta, GA 30322
(404)727-6314 (ph); (404)727-4448 (f)
tyandle@emory.edu
6/11*, 6/14*, 6/17*

Erika Burgess
Dr. Jared Flowers

Lauren Gentry

Luke McEachron