SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

SOCIO-ECONOMIC PANEL OF THE SCIENTIFIC AND STATISTICAL COMMITTEE

Webinar

April 13, 2021

Transcript

SEP Members

Dr. Scott Crosson, Chair
Dr. Jason Murray
Dr. Kurt Schnier
Dr. Jennifer Sweeney Tookes
Dr. Tracy Yandle
David Dietz
Dr. Andrew Ropicki
Adam Stemle
Dr. John Whitehead
Dr. Chris Dumas

Council Members

Mel Bell
Steve Poland

Council Staff

Myra Brouwer
John Carmichael
Dr. Chip Collier
Allie Iberle
Dr. Michael Schmidtke
Julia Byrd
Cindy Chaya
John Hadley
Cameron Rhodes

Invited Attendees and Observers

Rick DeVictor
Dr. Genny Nesslage

Other attendees and observers attached.

The Socio-Economic Panel of the Scientific and Statistical Committee of the South Atlantic Fishery Management Council convened via webinar on April 13, 2021, and was called to order by Chairman Scott Crosson.

INTRODUCTION

DR. CROSSON: Good morning to the 2021 meeting of the South Atlantic Council's Socioeconomic Panel. I'm Scott Crosson, and I'm the Chair of this, and I'm also a member of the SSC. I guess we'll go through the introductions, and we have several new members at this meeting. Tracy Yandle won't be on until late this afternoon. She is New Zealand, where she has emigrated, and that's a separate story, and so this will probably be her last meeting, but she should be here by mid-afternoon today. We're going to go through, and we need to do our introductions. Do we need to do those again, since people have already logged-in, John?

MR. HADLEY: If you wouldn't mind, and I think it might help with voice recognition, and just since we do have a lot of new members, just so everyone kind of knows the general background and what state everyone is coming from.

DR. CROSSON: All right. I am an economist, and I'm with NOAA and at the Southeast Fisheries Science Center in Miami, Florida. Let's just go around the room, as best you can.

MR. HADLEY: If it's okay with you, I can just run down the list of SEP members. That way, we have an order to it.

DR. CROSSON: Sounds good to me.

MR. HADLEY: Okay. David Dietz.

MR. DIETZ: Hi. I'm David Dietz, and I'm one of the new members on the SEP. I am the Fisheries Economics Program Manager for North Carolina's Division of Marine Fisheries, and I'm happy to be here. Thanks.

MR. HADLEY: All right. Thank you. Chris.

DR. DUMAS: Hi, folks. I'm Chris Dumas, and I'm an Economics Professor at the University of North Carolina Wilmington, working on coastal economics issues. I'm an SEP member, an SSC member, and I'm also on a review panel for the National Academy of Sciences this year, looking at the MRIP methodology and reviewing that, and so I've got a lot of fish stuff going on this year.

MR. HADLEY: All right. Thank you. Jason.

DR. MURRAY: Hi. I'm Jason Murray, and I'm in NOAA's Office of Response and Restoration. I recently moved to the West Coast Branch, and so I'm coming to you from California today.

MR. HADLEY: All right. Andrew.

DR. ROPICKI: Hi. I'm Andrew Ropicki, one of the new members. I'm an Assistant Professor in food and resource economics at the University of Florida, specializing in marine resource economics issues, and I'm also the Florida Sea Grant Marine Resource Economics Specialist.

MR. HADLEY: All right. Kurt.

DR. SCHNIER: Good morning, everybody. I'm Kurt Schnier, and I'm a Professor of Economics at the University of California Merced, and I've been doing fishery economics work for some time, and I am calling you from California right now.

MR. HADLEY: Okay. Adam.

DR. STEMLE: Good morning, everyone. My name is Adam Stemle, and I'm an Industry Economist with the Southeast Regional Office in St. Petersburg with NOAA. Also, I'm a new member of the SEP.

MR. HADLEY: I will say welcome to all of the new members. We have several new faces, and we're certainly excited to work with everyone. Next on the list, we have Jennifer.

DR. SWEENEY-TOOKES: I'm Jennifer Sweeney-Tookes, and I am probably the lone non-economist in the room, it sounds like. I'm an applied anthropologist, and I work in Georgia, South Carolina, Florida, and the U.S. Virgin Islands, and I do a lot of interdisciplinary work with economists and political scientists. Tracy Yandle and I do a lot of work together on fisheries and the impact of decision-making on fishing communities.

MR. HADLEY: All right, and, John, I just sent you a PIN, and I see that you're calling in by phone. If you could enter that PIN, you should be able to mute and unmute yourself over the phone. If not, we will come back to John here in a few minutes. All right. We may have to come back to John, but, otherwise, we have everybody that is present currently.

DR. CROSSON: Okay. All right. I'm sure that we'll hear from John in a few minutes. I guess the next item we have on our agenda is to review and approve the agenda, and so has everybody had a chance to look at that? Are there any objections? We're going to try and get through this today, and I've kind of sketched it out this morning, or for the rest of the day, I guess, and I'm trying to time it.

I think we can get through the citizen science stuff and the Georgia waterfront presentation and get into the allocation decision by this morning, and we'll probably finish the allocation decision hopefully by mid-afternoon and then move on to other materials for the dolphin and wahoo workshops and the fishery performance reports. I had several people who had emailed me asking about writing assignments, and, if you haven't been here before, the way I divvy this up is I take a look at what people's backgrounds are and try to divvy up in a reasonable workload. Is that John?

DR. WHITEHEAD: Yes, I'm here.

DR. CROSSON: Welcome to John Whitehead.

DR. WHITEHEAD: Thank you, all.

DR. CROSSON: What will happen is, when we go through the presentation, when this group gets talking, try and do you best job that you can of trying to keep track of what the major points are of discussion and agreement and disagreement. We're going to try and get through the questions that staff have put up for us, as best we can, and we don't have to have it word-for-word.

Then, after the meeting is over, try and draft up a few paragraphs answering those questions, and it can be in a Q-and-A form, or it can be in a paragraph form, whatever seems to flow best, and work with whoever else I have assigned it to, and then just send me a draft as quickly as you can, because this is a really tight turnaround for the SSC meeting, and this committee answers -- Technically, this committee is a sub-committee of the SSC, and so the SSC has to approve the report at its meeting, and it's meeting later this month, in just a few weeks, and so the SSC has to approve the report, and they always do. We have never had any disagreement with that, and then, at that point, it can be forwarded on to the council.

Of course, council staff -- A lot of this is for council staff, to try and get some guidance about what we think would be the best way to handle economic and social issues on management actions, or proposed management actions, and so they will be paying attention anyway, and so we're pretty good on that, and so, again, do we have any objection to going through and approving the agenda, as outlined? Hearing no objection to that, I'm sure that everybody has read the 2020 minutes. Are we okay with those? Hearing no objection, I assume that those are approved. Then we have an opportunity for public comment. John, do we have any today?

MR. HADLEY: I don't believe so, but, if there's anyone from the public that is on the webinar, feel free to raise your hand, digitally speaking, and you can see, in the kind of navigation menu, there's a hand. If you would like to make comment, feel free to raise your hand, and we will unmute you. Scott, I am not seeing any hands raised.

DR. CROSSON: Okay. Sounds good to me. It looks like the first item we have up here is just a review by council staff and going through the different council amendments that are on the docket right now, and so, John and Christina.

RECENT AND DEVELOPING SOUTH ATLANTIC COUNCIL AMENDMENTS

MS. WIEGAND: I'm going to go ahead and go over a couple of amendments. For those of you who are new to the SEP, we present this document at every SEP meeting, and it contains all amendments that the council is currently working on in some fashion, be that actively working on them at the council level or if they've been recently submitted to NMFS for approval or if we've started working on them and they've been postponed, for one reason or another.

This is a lengthy document, and I'm not going to go through every single amendment that's in here. Otherwise, we would be here all day, but I did want to highlight a couple of amendments that may be of particular interest to the SEP, and the first one that I wanted to highlight is Amendment 48, and this is the wreckfish ITQ program amendment.

At their last -- Not the last meeting, but the meeting before -- The SEP has been pretty involved in reviewing the wreckfish ITQ review that was completed in 2019, and so I wanted to let you all know that the council has started to move forward with an amendment to address the recommendations that were in that ITQ review. It's likely going to be a lengthy process. The two big things are going to be moving the program from the paper-based program, where the wreckfish fishermen are having to fill out paper coupons, to an electronic reporting system. This is going to require review of the entire CFR, which is pretty closely tied to the paper-based system, and so it's going to be a complete overhaul to get this electronic system in place.

The goal is to have this amendment approved, tentatively, by the end of next year. We're also going to start moving forward, at the request of the council, at looking at what would be needed to consider a VMS requirement for this fishery. If you will recall, one of the things the shareholders have expressed a lot of concern about are the offloading times that are required in the regulations, and one of the ways around that is to look at a VMS requirement, and, when we met with the shareholders, back in October, the general feeling was that they're not necessarily fans of VMS, but they do see it as perhaps a necessary evil, and so, in the coming months, we'll be working with the shareholders quite a bit, as well as the council, to develop consideration of the VMS requirement, as well as all of the other actions and alternatives that are going to be in this amendment, based on the ITQ review. I will pause here, briefly, to see if there are any questions about wreckfish, before I move on to the allocation amendments.

I am not hearing anyone jump out with questions, and so the next three amendments that I wanted to highlight are the three amendments that council staff is currently working on related to allocations. Two of those are snapper grouper amendments, and there is Amendment 50, which addresses red porgy, and Amendment 49, which addresses greater amberjack, and then there's also Coastal Migratory Pelagics Amendment 34, which addresses king mackerel.

I wanted to highlight these, because we're going to be talking about allocations later on in the meeting, but there are some amendments that we're currently working on and that are going to need to go through the council process prior to staff fully developing the decision tree blueprint that we'll be talking about later, and one of those is Amendment 50, which is red porgy. Unfortunately, red porgy are overfished, and overfishing is occurring, and the stock is not making adequate progress towards rebuilding, and so, as a result, the council needs to establish a new rebuilding plan for red porgy no later than June 12, 2022, and so we do have a statutory deadline for that.

Then greater amberjack is also coming off the back of a new assessment, SEDAR 59, and so that amendment looks at revising catch limits and optimum yield, and, again, sector allocations, and the reason we're looking at sector allocations for sort of every amendment that comes off an assessment, as well as unassessed species, is because of the new MRIP-FES revisions. Moving from the Coastal Household Telephone Survey to the new FES numbers requires the council to sort of go back and look at allocations under the light of that newly-recalculated data, and they have been doing this in a couple of ways, depending on the amendment.

They have asked for alternatives that consider retaining the current percentages that are in place, and they have also asked us to consider holding the commercial sector at their current poundage, and not the percentage allocation, but the poundage they are currently experiencing and allocating

the rest to the recreational sector, as a way to account for the fact that a chunk of the change in catch levels is due to that MRIP-FES conversion, or recalculation.

They have also, specifically for red porgy, considered removing sector allocations altogether, and then, for king mackerel, which I can scroll down to real fast, king mackerel is a bit of an interesting case, in that sector allocations have been in place for king mackerel since the early 1990s, and they were actually set back in Amendment 1 to the CMP FMP, and they have not been revised since, and so, while, for red porgy and greater amberjack, they can rerun the original allocation formula, with the new revised numbers, that's not possible for king mackerel, because the allocations were based on data from 1978 to 1983, I believe, and that data is so old that it's not really supported anymore.

One of the things the council has asked us to do for king mackerel is to go back in time and look at when the total allowable catch, or the annual catch limit, whenever term was being used at the time, may have been restrictive, to try to find a time series of landings that may be appropriate for sector allocations for king mackerel, be that an older time series, a newer time series, or some combination thereof.

Those are the three big allocation amendments that we're working on. Allocations are also being considered for Dolphin Wahoo 10. Dolphin and wahoo are unassessed species, and I know you all have talked about that amendment in the past. We're also looking at allocations for Gulf cobia, with the Gulf Council, but I would say the three big allocation amendments right now are king mackerel, red porgy, and greater amberjack. Those are really the only amendments that we wanted to highlight for you guys today, and I will go ahead and stop here and see if there are any questions about those amendments, or any of the other amendments that you might have looked at within this document. I am not hearing any questions, and you guys are going to give me a big ego and make me feel like I explained things too quickly.

DR. CROSSON: It will be interesting to see the result of some of these, especially since it's such a big review of the wreckfish ITQ, and it will be interesting to see what comes out of that. I don't hear any other comments, and I guess we're ready to move on to the next agenda item.

MS. WIEGAND: All right. Julia, since that's the Citizen Science Program, I'm going to go ahead and throw the screen over to you.

CITIZEN SCIENCE PROGRAM UPDATE

MS. BYRD: All right. Sounds good. Thanks, Christina. Good morning, everyone. For those folks that I haven't had an opportunity to meet yet, I'm Julia Byrd, and I am the council's Citizen Science Program Manager, and so I'm going to give you guys a quick update today on what's been happening in the council program over the past year and really try to highlight a few things that have gone on since you all last met in the spring.

The first thing that I wanted to update you guys on were kind of programmatic-level activities, and so the first thing is, last December, the council adopted kind of new, or updated, citizen science standard operating policies and procedures, or SOPPs, and those contained a new kind of program vision, mission, goals, and objectives, and I will kind of talk about those a little bit more in a few

minutes, but we're really excited to have kind of those kind of new vision, mission, goals, and objectives, helping us kind of articulate kind of where we want the program to go and how we're going to get there.

Another thing we're pretty excited about is that, last month, an article came out in *Bioscience* on the development of the council's Citizen Science Program. Rick Bonney was the lead author on that article, and he is someone who has been advising us throughout the development, and kind of ongoing now through the council's Citizen Science Program, and he recently retired from the Cornell Lab of Ornithology, and he was their kind of director of public engagement and one of the cofounders of eBird, and so we were really excited to have this article about the council's program in *Bioscience*, and that's a really kind of publication with a very broad audience, and so we were excited to share kind of information about our program and about all of the resources that our Citizen Science Action Teams developed, and so, if you haven't had an opportunity to check it out, I would encourage you to do so.

We are also excited because one of our pilot projects, FISHstory, was featured as one of the NOAA projects in their FY 2019/2020 Citizen Science and Crowdsourcing Report to Congress. I will share a little bit more information about FISHstory later, but we were really excited to be included in that publication.

Then another thing that I thought would be of interest is, last year, we worked with some NOAA colleagues to coordinate a symposium at the annual American Fisheries Society meeting that was held virtually last year, and the symposium really focused on kind of how citizen science and other kind of non-traditional data sources could be better incorporated into stock assessment and management, and so we had a lot of great presenters, and we're actually now trying to kind of turn that symposium into kind of a special issue for *Fisheries*, and so we'll be kind of working on that, hopefully, over the next year.

I also wanted to make sure that you guys were aware that NOAA recently released their citizen science strategy, and so citizen science is one of six kind of core science and technology focus areas for NOAA, and this citizen science strategy that they released kind of highlights how they want to incorporate citizen science into their overall mission.

Then the last kind of programmatic-level thing that I wanted to mention is we continued with our citizen science kind of program outreach, and, if you guys don't follow the council on social media, I would encourage you to follow them for this month, and April is Citizen Science Month, and so we're doing a campaign that's being led by Allie Iberle on our staff to really highlight kind of the people who power our program, and so I would encourage you to check out the social media posts and blog posts that we've been doing for that.

The next thing that I wanted to talk a little bit about with you guys is some overall kind of program planning and evaluation work that we're doing. As I mentioned a few minutes ago, we've been working, over kind of the past year, to develop kind of a new vision, mission, kind of goals, and objectives, because all of those things are kind of needed in order for us to evaluate the program, to figure out if it's doing what we want it to do.

We're really excited to work with our Citizen Science Operations Committee, which is one of our advisory panels, to develop kind of these new program planning documents and really help us kind

of articulate kind of where we want the program to go and how we're going to get there, and so the overall vision is to kind of -- We're advancing science and increasing trust, one project at a time, and then we have four main goals.

The first one is really focused on kind of designing and sustaining a program framework. The second is focused on kind of facilitating individual projects. The third is really focused on data and making sure the data collected are accessible, robust, and fit for purpose, and then the fourth goal is a little bit different. It's focused more on kind of learning, collaboration, and engagement, and so, as we look forward to evaluate the program, it is more straightforward to evaluate kind of those first three goals.

Once we sort of have project results in hand, they can be kind of examined a little bit better, but this fourth goal is a little bit kind of different, and, in order to determine whether we're kind of increasing learning and trust, we need kind of baseline information, and so that's one of the things that we're focusing on this year for our kind of initial evaluation plan, and so we're working with Rick Bonney to gather some of this baseline data on knowledge and attitudes and engagement, trust, and collaborations from a variety of stakeholders.

We're focusing on three main stakeholder groups for this initial effort, scientists, managers, and fishermen, and we have kind of a three-pronged approach. The first stage is kind of doing interviews, and so Rick Bonney will be conducting interviews, about a dozen interviews, with a variety of fishermen, scientists, and managers throughout the region. Then we'll be working to develop an online survey and then implement and analyze those survey results next year. Right now, we're in the process of identifying who we may want to include for these stakeholder interviews, and Rick is working on the development of an interview script.

Now I'm going to switch gears a little bit and talk about some of the projects and collaborations that we have under development now, and the first one is on kind of rare species observations, and so we're working with a variety of partners. These efforts are really being led by Janet Nye, who is at the University of North Carolina, and the idea is to develop a project to collect information on kind of rare species observations, where those observations could serve as an early warning system for climate change.

We're trying to kind of model this project after a very successful citizen science project in Australia called Redmap, and so it's really trying to bring that program to the U.S., and so we have been putting in proposals to try to get some seed money for that project. We have also been working on a project with REEF and SECOORA to work with recreational divers to collect information, in particular length, on some data-limited species, like hogfish and some of the grouper species, and we're hoping to kind of pilot test this down in the Florida Keys. We've been working with these groups, and we've submitted a variety of proposals to try to get some initial seed money for that project.

The next project, I'm going to say too much about, and you all will be hearing much more about it this afternoon, and it's the dolphin wahoo participatory workshops that we've been working on with folks from the Science Center, and, really, Mandy Karnauskas and Matt McPherson have been leading these efforts, and the idea here is to kind of hold a series of kind of participatory workshops in North Carolina and Virginia and down in the Florida Keys and to develop kind of conceptual models of the dolphin wahoo fishery in both of those areas, to provide to the council

to help inform management decisions. Mandy and Matt will be going into details on their methodology and some of their preliminary results with you all this afternoon.

The next project is one that's called eMOLT, and this is a very successful citizen science project that's run out of the Northeast Fisheries Science Center by Jim Manning, and it's really been around for decades, and it's really where scientists are working with commercial fishermen to collect environmental and oceanographic data, and so they're basically attaching probes to gear to collect things like bottom temperature, and so the eMOLT folks reached out to us last year, and they're interested in kind of expanding their program to the South Atlantic, and so they submitted a proposal to do that, and we provided a letter of support, and, unfortunately, that proposal wasn't successfully funded, but we're looking forward to continuing discussions, because we think that would be a great project to bring down into our region.

Then the last kind of project under development is one that we're working on with the Dolphinfish Research Program, Dr. Wes Merton, and looking to expand some of the tagging work that he's doing to learn more about dolphin movement and migration, specifically in kind of the Mid-Atlantic and New England regions, where the council manages dolphin, but there is really limited data on movement and migration up in that region of the Atlantic coast, compared to down further south, and so we'll be submitting a proposal this week to hopefully expand some of the work that he's doing up into that Mid-Atlantic and New England area.

Now I want to switch gears a little bit and update you guys on the two projects, pilot projects, that we have underway now, and the first one is FISHstory, and so, at you all's meeting last spring, we kind of gave you an update on FISHstory and did a demo of the project, but the project hadn't launched yet, and so we wanted to kind of update you guys on what's been going on with this project, and I know we have a number of new folks here, and so, just as a little bit of background information, this project is a pilot where we're trying to document historical for-hire catch and length of fish, using kind of old, historic fishing photos from the for-hire fleet. We're really trying to fill a data gap back in the 1940s to 1970s, which is prior to when any of the for-hire kind of data monitoring and collection programs began.

The project kind of has three components. The first is kind of digitizing these historic photos, and we worked with kind of Rusty Hudson, who is a retired fisherman down in the Daytona Beach, Florida area, and he provided over 1,300 photos from his family's fishing fleet, from the 1940s to 1970s, and he actually digitized all of those photos and provided them to us, and so now we have them in an archive here on the council's servers.

Then there are two other components to the project. One is to try to kind of estimate for-hire catch composition, and that part of the project is underway now. We're collecting data through an online crowdsourcing platform called Zooniverse, and the project launched in Zooniverse in May of last year, and then the third component is we're trying to develop a method to estimate the length of fish in these photos, to estimate length composition, and so that is underway now, and I'll give you an update on both of those here in the next few minutes.

For the for-hire catch composition portion of the project, again, we built a FISHstory project in the online crowdsourcing platform called Zooniverse, which allows you to develop kind of tutorials and training materials to get citizen scientists, or members of the public, to help analyze images, and so, in our case, we are training citizen scientists to help us identify and count the fish in these

historic photos, and so, from launching the project in May, we were absolutely blown away by the interest we got in the project.

I checked last night, and now we have over 2,030 volunteers who have participated in the project, and they have made over 33,700 classifications, and so we're really just being super excited that there's so many people from all over the country, and even the world, who are interested and want to help us kind of analyze these photos.

For each photo, we have multiple volunteers kind of analyze each photo, and, when there is volunteer disagreement, that photo will go to our validation team, and the validation team is a group of about twenty-seven fish ID experts, and it's a mix of scientists and fishermen, who will kind of review those photos where there is volunteer disagreement, and so our validation team began kind of validating the live data from Zooniverse at the beginning of the year, in January, and they are continuing to do so today.

To give you guys a quick update on the length analysis portion of the project, we have kind of finalized our protocol, and so what we're really doing is this project is we're using the lumber in the leaderboard where the fish is hanging as a scale to estimate fish length, and so we've developed the protocol, kind of finalized it, and we are pilot testing it on king mackerel, and so we have five kind of analysts in different locations that are helping us with these individual fish measurements, and we have completed measurements for over 700 photos now.

Then Chip Collier took the lead on developing a re-sampling method, so that we're actually going to be able to estimate length compositions from the photos, and, last fall, we presented those methods that we've developed to the SSC, at their October meeting, and, in general, they were kind of really supportive of the project and thought it could provide useful data, and they also provided some really helpful suggestions to try and help us improve our methods, and then we have also reached out to the lead stock analyst for South Atlantic king mackerel, to let him know about the project, and he too was really supportive of the project and that thought that it could provide some useful information for the next assessment as well.

Then the last thing that I wanted to mention and update you guys on for FISHstory is to share a number of kind of FISHstory features that have been done, and so we were really so excited that so many volunteers were interested in FISHstory, but we've also had a lot of kind of blobs and podcasts interested in the project as well, and so, on this slide, all of these different links will take you to different features the have been done on FISHstory over the past year.

Just to highlight a few that we were really excited about, there is one that we did a guest blog for *Discover Magazine* on the project, and that really helped us spread the word far and wide about FISHstory, and then were also featured as one of forty projects in Zooniverse's 2020 highlights book, and so they have hundreds of projects, and we were kind of one of forty to be chosen to be highlighted in their annual book, and so those were two that we were really excited about, and, as far as next steps for FISHstory, we will be kind of finished collecting data and analyzing data as part of our initial grant.

Our initial grant money will run out kind of during the summer this year, but we've already been trying to kind of put together funding to continue and expand the project, and so we submitted a

grant, earlier this year, to do just that, and we should find out later this month if we are successful with that funding opportunity.

Then the last project that I wanted to update you guys on was our kind of initial citizen science project, SAFMC Scamp Release, and so I know some folks are new to the SEP, and so this is really a project that we're working with commercial, for-hire, and recreational fishermen to collect more data on released scamp grouper, via a mobile app, and so we're really focusing on trying to collect information to fill a few key data gaps, really on the size of released fish and on information that will help inform discard mortality, things like depth or whether or not a descending device was used or a fish was vented before it was released, things like that.

This project launched in June of 2019, and, since then, we've been working to recruit and retain fishermen to participate in the project, and the data that were collected in the project thus far were shared as part of the SEDAR 68 South Atlantic and Gulf of Mexico scamp grouper data workshop that was held last year, and we've collected kind of limited data thus far, but the preliminary feedback we got was that the data that was provided by our SAFMC Release participants and collected through the app was really helpful in interpreting trends in other datasets, and there is still a great need, in particular, to have more length information on discarded fish, and so, hopefully, as this project kind of moves forward and gets a bigger sample size, we can help fill some of those data gaps.

We've also been working with a graduate student whose research is focused on identifying kind of the best strategies to market some of these self-reporting apps to fishermen, and he, as part of his project, has done interviews with some of our SAFMC Release participants, and he is analyzing some of the MyFishCount survey data and marketing strategies that BeBe and Kelsey employed over the past several years.

Then a lot of work this year has really been focused on part of this project that's being funded through an ACCSP grant. On this grant, we've really been working very closely with folks at the North Carolina Division of Marine Fisheries, as well as ACCSP and Harbor Lights Software. This project has two components. The first one is really to combine our SAFMC Release app with North Carolina DMF's Catch U Later app, which is an app that was modeled after SAFMC Release, but is focused on collecting information on released flounder, as opposed to scamp grouper, and so the idea is we're going to combine these two projects under a new ACCSP Citizen Science app. That's the first component of the project.

The second component of the project is we're working to develop kind of customizable citizen science app, so that partners would be able to kind of build an app on the fly for citizen science projects in the future, and I'll say a little bit more about that in the next couple of slides, but, for the first component of the project, when we're combining SAFMC Release with North Carolina DMF's Catch U Later, we've been working very closely with kind of a core group to get that new ACCSP app up and running and put those two projects under the app.

By doing this, we are going to be able to expand SAFMC Release to collect information on all shallow-water grouper and not just scamp grouper, and the target to launch this new kind of ACCSP citizen science app, with our two projects underneath, is later this spring, hopefully in the next month.

Just to give you a little bit more information on this new ACCSP citizen science app, it's going to be called SciFish, and Allie Iberle, who is on our council staff, really led the efforts to kind of name and brand this new app, and so, when the app launches in the spring of 2021, it will house two projects, the SAFMC Release project and North Carolina DMF's Catch U Later project.

Then, as we move into the future, it will house more projects from ACCSP partners, and, as we work to develop this customizable portion of the app into the future, partners would be able to kind of build a project, within the SciFish app on the fly, based on a pool of data fields, which they would be able to choose from.

I want to talk a little bit more now about kind of the second component of the project, which is really we're trying to hold this kind of series of scoping meetings to kind of help with the development of this customizable citizen science app, and we're really trying to develop an app that encourages and supports the capture and sharing of information about Atlantic coast fish, and so we're working with a great kind of group of folks to do this, and an outside facilitator called Knowinnovation, and so we first started to gather information, as part of this process, back in February, when we did an online questionnaire to gather information on what people would want to see out of a citizen science app, from a very broad group of fishermen, scientists, and managers all along the Atlantic coast.

Then, as a second step, we held a series of two virtual townhall meetings, where we really tried to dig more into the responses we got from the questionnaire, to better understand folks' needs, and then, now, we're working on holding a series of three kind of half-day virtual workshops, where we have a core group of around thirty-five fishermen, scientists, and managers who are helping us build a roadmap for the continued development of this customizable citizen science app.

For things that we thought may be of interest to you, through these kind of townhall meetings, people brainstormed a lot of different ideas of what would be helpful to include in kind of a citizen science app, and so some of the socioeconomic ideas focused on kind of creating an inventory of fishing infrastructure, collecting information on fishermen demographics, values, motivations, barriers to fishing, doing wholesale and resale prices for seafood by species and size, angler satisfaction over time, and a number of kind of other ideas that you can see captured on this slide, but something else that was really interesting that came up through just the discussions, and I know we've been lucky to have John and Christina, as well as David, involved in this process, is kind of these broader questions that we thought it would be great to get feedback from you guys on, which is talking more about kind of what niche citizen science can fill for some of the social and economic information and what information can't be collected through other means that citizen science could help kind of fill a specific data gap.

We're hoping to get information for you guys on some of these discussion questions, but I'm also happy to take feedback from you guys, or answer any questions, on any of the other information that I've presented as well, and so, with that, that's all I have to say, and now I would love to answer any questions or get some feedback from you guys on some of these specific discussion questions.

DR. CROSSON: Thank you. I have a question, and so the information -- So if I sign up for an app, if I put an app on my phone, any of the ones that we're using, is there background information about me that is going to the dataset, my age or my address at least, or anything like that?

MS. BYRD: Right now, the way that SciFish is set up for the Release project -- I can give you kind of that information, and it's set up through ACCSP's SAFIS system, and so there is some general information, contact information and then city, state, address information, but that's -- Then birthdate as well, and so you can get age and general location, but that's really the information that's collected, at least as far as SAFMC Release goes.

DR. CROSSON: Other questions from folks?

DR. ROPICKI: I was just curious. At these virtual workshops and townhalls, have you asked participants about other fishing-based apps that they might be using? Is there any concern with saturation or stuff like that? I'm not sure about the South Atlantic region, but I know there's iSnapper and FishVerify and a few others out there, and I'm just curious. Is anyone bringing up the idea that there are too many reporting tools?

MS. BYRD: Yes, and that's something that has come up, and, as part of kind of our third workshop, we're going to be asking people to talk about some of those apps and what they like about them or dislike about them or that sort of thing. I think what we're trying to do with this customizable app is make it so there is one app that can house multiple citizen science projects, and so, right now, what we're trying to do is narrow down kind of what the data gaps are, and some of that may entail what isn't collected through other means, that we can collect through this app. Right now, we're trying to answer some of those questions on what we need to kind of focus on in this particular app.

I think there are a lot of apps on the market right now. As part of the graduate student who is working on the SAFMC Release project, that's some of the information that he was collecting through his interviews with some of our Release participants, and so I think app saturation is a concern. I think what we're trying to do is make a kind of one-stop shop that can house multiple citizen science projects from entities along the Atlantic coast, and so, right now, we're trying to narrow down kind of what data gaps we want to focus on, and so does that answer your question, Andrew?

DR. ROPICKI: Yes, and I was just curious. Thanks.

MS. BYRD: Thank you.

DR. SWEENEY-TOOKES: I have a few comments, if that's all right. First of all, it's always fun to see what you all are doing, Julia, because you do some really interesting work with the citizen science angle for the council, and I wanted to go back to a few slides, if I could. Way back on Slide 4, you mentioned working with Rick Bonney to gather baseline data and using that to go forward, and I just wanted to drop a mention that that idea of gathering fisher data on interest in regulation, or trust in regulation, and attitudes about regulations, Tracy Yandle and I have a fair amount of data on that in Georgia and South Carolina, and so we might want to just talk some day and let you know sort of maybe what interview questions worked really well for us and which ones you probably want to avoid.

MS. BYRD: That would be awesome, Jennifer. I would love to follow-up with you guys on that, especially as -- So we're in the really early stages right now, and so I would love to maybe get you

all on the phone with Rick as well, since he's going to be the one taking the lead on developing our interview script, and so thank you for that, and I will definitely follow-up with you and Tracy after the meeting.

DR. SWEENEY-TOOKES: Excellent, and I just volunteered her, and she's halfway across the world asleep right now, but that's how it goes if you're not here, right? The other thing I wanted to ask you is, on Slide 5, when you were talking about the first two projects, the rare species observations and the diver observations, this is just more of a curiosity, and I wanted to toss it out to the group, but you mentioned the Redmap project in Australia, and did I hear you correctly?

MS. BYRD: Yes.

DR. SWEENEY-TOOKES: Is that the root of a paper that I just saw recently that said that part of the movement of sharks in Australia had to do with climate change, that they were seeing large numbers of sharks in some regions that hadn't been there before, and does this ring a bell to you?

MS. BYRD: I hate to say that I am not sure if that was Redmap data or not, and I know that -- So Redmap has been around for a number of years, and there have been a number of papers published using their data, but I am not sure about that one, Jennifer, but I can look into it and get back to you.

DR. SWEENEY-TOOKES: Well, I raise it, and I know that Adam worked in Georgia for a good long while too, Adam Stemle, who is on this call, but one of the things that has come up a lot in Georgia, and something that I literally just presented on two weeks ago at an applied anthro meeting is that there's what fishermen perceive to be a really increased number of sharks, at the same time that we're hearing that the shark populations aren't really all that healthy, and so we've been starting to speculate, and is this that migration paths are changing, because the oceans are warming, and is that what's affecting the number of sharks that they're seeing on the shrimp boats in Georgia and South Carolina, and so I don't know if you had any perspective on that, or if anyone else on the call could point us to any literature, but it's something that just come up very recently, as we've been looking at some of our qualitative data and thinking about climate change attitudes among fishers.

MS. BYRD: I will say that I know the increase of shark predation is something that we have heard a lot from fishermen, all along the South Atlantic, and the Gulf of Mexico too, region, and so this idea of trying to quantify shark predation is something that's come up as we've been talking through these kind of customizable citizen science app workshops, as something that there's not a lot of information about it, and we would like to try to quantify that somehow, but that could be challenging to do, and so I can say that that is something that is of interest to many fishermen along the coast, and it's something that we're talking about through these kind of customizable app workshops, but I don't really have much insight as to whether it's some species maybe increasing in abundance, or others may not be, or if it's a change in migratory patterns, and so others on the call may be able to address that better than I can.

DR. SWEENEY-TOOKES: I am hoping that someone jumps in now, because I'm really curious about this, and you're right. It's something we're hearing over and over, and it sounds like that sort of might be a little bit encapsulated under one of these two projects that you mentioned here.

MR. HADLEY: For further follow-up on what Julia explained, we've certainly heard a great deal, and the council has certainly heard a great deal, of feedback on the increasing shark numbers, and it just seems like it's a combination of many things. You have certain species that are rebuilding, and they appear to be rebuilding very quickly, and it certainly seems like you do have a climate component to that, where, particularly on the northern end of the range, they're starting to show up in areas where they haven't before, and in fairly large numbers.

Additionally, there's an interesting behavioral aspect to it, where it's almost like an outboard motor, or a diesel inboard motor, is almost the dinner bell, where they get to hearing that, and they know that fish are going to be coming up off the bottom fairly soon, and without a -- Some of these species may be protected, and there is no predator-avoiding instinct to them, and so they kind of associate boats with food, and so that's another aspect of it. I think there is -- It's ongoing research, but there is -- It's probably multiple variables that are contributing to the increased interactions with sharks, but there is no doubt that it's increasing across the region, and also further north.

DR. SWEENEY-TOOKES: Interesting. John, if you have any literature you could point me to, I would love it, but I wonder then, Julia, if that might fold in neatly under the other two apps that you all are already building into the platform, shark observations, and you might have a whole lot of buy-in from fishers at the idea of being able to report every time the net is being torn up by a shark.

MS. BYRD: Yes, and that's something -- I know we have a couple of HMS folks too who have also been hearing this information from fishermen who are interested in having something like that included, some way that people are consistently kind of sharing these observations, and so there's a better -- A more kind of quantitative way to kind of get at the frequency with which this is occurring, and so, yes, I think that's a good point, Jennifer, and I think that is something that I think fishermen would be interested in sharing.

MR. HADLEY: One last follow-up to that, and I know that there is an option on the MyFishCount app to indicate a shark interaction, a bitten fish or a lost fish due to shark interaction, and so that's kind of the very tip of the iceberg on being able to report it, but I think that's a good point, and it's something that -- Some of the feedback that the council has gotten back from HMS, or we have gotten back from HMS, as council staff, is that they need more information, and it seems like citizen science would be a very good quantitative way to do that, and so point well taken.

DR. SWEENEY-TOOKES: Yes, and we did actually have a graduate student at Georgia Southern who tried to quantify shark interactions with nets in Georgia, and I wouldn't call it representative data, but, if you want to take a look at it, I can share it, but we've talked in the past about how to persuade fisher behavior, how to get buy-in and open people's minds to participating with the council and council needs, and so this might be one of those ways to open that door, too. If they're being heard on this really important front, they might be more likely to look at some of the apps, other apps, and more likely to report some of their data, because they actually feel like their opinion matters on something they think matters.

MS. BYRD: I think that's a really great point, Jennifer.

DR. SWEENEY-TOOKES: Thanks again for all you all are doing. This is looking good.

MS. BYRD: Thanks, Jennifer.

MR. HADLEY: I see that Chris has had his hand up for a while. I will note that we're going to try to just have a free-flowing conversation, if you will, but we'll just hopefully allow everyone to speak up as they see fit, but, Chris, I do see that you have your hand raised.

DR. DUMAS: I have three quick comments. The first is the survey that's about -- The citizen science survey that's about to kick off of the fishers, to gather the information, that could be -- The results from that could be combined with Jennifer and Tracy's survey data, and the Rick Bonney and the survey with the Jennifer and Tracy survey, and, if the questions are similar, that's great, but you might able to use multi-frame methods to combine those two surveys if the sample frames, the fishers you're surveying, partly overlap. Then multi-frame methods can be used to kind of combine information from the surveys in a cool way, and so you might want to look at that.

To the question of reducing saturation, fisher saturation from too many app, one thing that would be cool would be just for all the different app makers to agree on a system of a unique fisher trip, an ID number, and then, when any one of the apps collects a record from any fisher, that record automatically gets sent to all of the other apps, so that all the apps help each other to collect the data, and so, if any one app collects data, that benefits all the other apps, and so they form them in sort of -- So you get them cooperating with each other, rather than competing.

Another thing is that, from a fisherman's perspective, if they normally post like a picture of their fish on Facebook or Instagram, then having to also post the data on your fishery citizen science app is like a pain, and it's an additional thing they've got to do. What would be cool is if you could set it up so that, if they post their picture, or their data, on the citizen science app, it automatically gets posted to their Facebook or their Instagram, or wherever else they would normally socially share that picture, so that they only have to do it once. They could do it once with your app, and then it automatically goes on their Facebook, and it goes on Instagram, and they don't have to do that again to share it with their friends. Maybe you guys are already doing that, and I don't know, but that seems good.

The third point is that, in terms of additional data to collect that would be useful, in order to provide more timely data to improve in-season management of species that are managed under ACLs, and so to improve in-season management of species managed under ACLs, and, right now, the problem is the MRIP data is collected in two-month waves, and there's a delay for that data becoming available, and so, a lot of times, the MRIP data is not available in time to manage the species that are being managed under ACLs.

Well, an interesting study would be to look at the correlation between the citizen science data that comes in, the catch and the effort of the citizen science, even though it's not a representative sample, and look at the correlation between the catch and effort coming in from citizen science on a daily and weekly basis and how that corelates with the later MRIP wave estimates of effort and catch. How do the daily and weekly citizen science numbers coming in correlate with later MRIP wave estimates, and, if there's any correlation there, then maybe citizen science data could help contribute to estimating what's going on between the MRIP wave samples, or between the time when the MRIP wave estimates are available, especially to help speed up -- You could collect some citizen science data and then look at how the MRIP wave estimates came in for that same time period later and see how they correlate.

Then you could develop an optimal sampling plan for, if you could choose your citizen science anglers, if you could optimally set the sampling plan to sample your citizen science anglers to provide data, the optimal data, to help forecast between the MRIP waves, how would you design that sampling plan?

Now, if the anglers were forced to participate -- Now, you cannot force anglers to participate, but, if you had an optimal sampling plan, that would tell you how to target your outreach and recruitment efforts to try to reach and recruit those anglers whose data would be most useful in helping to predict catch and effort between the MRIP wave estimates and to help in-season management under ACLs. I know that was a lot, and so, if you guys are recording this, great, or I can send it later, but that's something that, based on some other committees I'm on, would be very useful, and it would be interesting to see how the citizen science stuff is correlating, in the short run, with like the immediately following MRIP wave estimate for that same time period. Thanks.

MS. BYRD: Chris, I will just say thank you so much for kind of all of those suggestions and thoughts that you passed along. I guess some things just -- I'm sure you all may already be in the loop on some of this stuff, but I think this idea that you gave on kind of working to kind of reduce saturation of apps and have kind of apps using kind of consistent data standards and sharing data in between apps, and I know there's been a lot of talk, and I think the Net Gains Alliance has been doing some work on this front, and then I know ACCSP is trying to -- They're working to develop some kind of voluntary reporting data standards from the kind of recreational sector.

I think nothing is as far along as some of the ideas you mentioned, but people are starting to talk about data standards, and so having people collect the same types of data kind of consistently, in the same format, and one of the things we're hoping to do with this customizable app is do just that, and so for kind of whatever our core kind of data fields are, there could be projects going on all along the Atlantic coast that are collecting data in the same format, and so it could potentially be used together, as appropriate, for different kind of management or other kind of decisions.

Then the idea of kind of having an app be able to automatically share things with social media, share pictures and things like that, I think that's a great idea. The MyFishCount app started to do that, and I believe it was last year, and so I think that's a great suggestion, and then it's really interesting, your insights on trying to figure out how to use citizen science to help with in-season management, and I know most of the projects, like the Release app that we're focused on right now, is very specific to like length of discarded fish, and so it may not kind of fill that niche that you're talking about, but I think that's a really interesting thing to consider, particularly because there are a lot of different apps, like MyFishCount or iAngler, things like that, that are hoping to regularly collect that information from kind of volunteer recreational anglers, and so thank you for all of those thoughts, Chris, and we may follow-up with you, if we have questions on things as we dig into some of these suggestions a little bit more.

DR. CROSSON: I know that length of discarded fish thing I think would be really interesting, because it seems like, to me, that's generally a partially-unfilled hole with MRIP. A lot of times, it's not -- Especially when you go back and intercept people at the docks, trying to get them to remember everything that they discarded is problematic, and there's all kinds of problems with recall bias and everything else, and so, if you have something that would be able to do this while they're still out there on the water, and then transmit it later, it would probably be more accurate.

MS. BYRD: Yes, and that's exactly what we're hoping to do with our project, Scott, and you know, from the scamp stock assessment, I think in the South Atlantic, there were very, very minimal length estimates of any discarded fish, and so I think it is a data gap that I think citizen science will be able to help fill, hopefully.

DR. DUMAS: Even if we just knew numbers of trips, like just how many citizen science reports came in in a given week, and that correlated with the later MRIP two-month-wave estimate for number of trips for that two-month wave, then we could basically have effort estimates that were more frequent. You might be able to know what MRIP is going to say before MRIP says it, with more -- There would be more variance, and it would be a less-precise estimate, but that could help with management, where they're trying to decide whether or not to shut down a season right now and they don't have time to wait for the next two-month MRIP wave to come in. The citizen science data could provide partial data to give some information to managers, sort of in between, on a more frequent basis in between, the MRIP waves, possibly. Thanks.

MS. BYRD: Thanks for everybody's kind of comments and feedback thus far, and I guess I'm happy to take any other questions or feedback, but, if any of you all have additional ideas of what niche kind of citizen science can fill, in particular for kind of socioeconomic information, we would love to kind of hear from you guys, because that was a really interesting kind of topic that came up through our townhall meetings, and so, if you all have thoughts on that, we would definitely be interested, now or you could reach out to me, or Christina or John, later to pass on that information.

DR. CROSSON: Thanks. Okay. Looking at these discussion questions, and we've danced around a lot of these things before, and so I don't know the place that you all are looking for it, but what's different from -- What niche can citizen science fill for social and economic information that's different from what we learn from the surveys and academic research?

Well, the informing decision-making, we sort of addressed some of that and came up with some ideas for that, along with what information can't be collected from other means. That first question, is there something you all would like more from that? I mean, that's a very broad question, about what you can get from citizen science that you can't get from other -- You can get most information, I think, from -- If you have enough money and time, but part of the advantage of doing citizen science is that you're displacing some of the labor on volunteers.

MS. BYRD: Yes, and I guess, Scott, I will flip back to -- I am going to flip back one slide, and here are some of the kind of socioeconomic ideas that were generated through kind of this brainstorming at townhall meetings, and do any of these strike you as kind of a good fit for citizen science or like a priority for socioeconomic information that could kind of work with a citizen science approach? Do any of these stand out to you guys, or do you have feedback on any of these things on the screen now?

DR. SWEENEY-TOOKES: Definitely the inventory of fishing infrastructure, because that's very labor intensive, and that's what I will be talking about next, was our attempt to do that here in Georgia, but, also, the last thing that you have listed here is very interesting, and it would be tremendously helpful to us, and that's ways to capture when fishermen couldn't go fishing, due to

things like storm events and water quality, and that's data that could be used not only for economic analyses, but also when we're talking about climate change and local pollution and things like that.

MS. BYRD: Thanks, Jennifer. I think, in our last kind of customizable app meeting, this idea of fishing -- This inventory of fishing infrastructure was something that one of our breakout groups kind of prioritized, and so it's good to hear your support of that too, and I'm looking forward to hearing your presentation, and so thanks for sharing those insights of kind of the first one on the list and the last one on the list.

DR. DUMAS: Two others that would be useful would be did your fishing trip originate at a public access point or a private dock or location, and that would be good to know, because MRIP only covers the public access points. Then the second question of, if you were not fishing today, what would you be doing instead? Would you be staying home, working, bowling, whatever? Thanks.

DR. CROSSON: Chris, what I would like to see as well would be -- Because I just saw this this weekend here in Miami, would be, if you put your boat in at a public ramp, how long did it take you to do it, because there was a line that I saw that was a quarter-mile long of people trying to get in, and it just tells me something about how determined people are to get themselves into the water, how much of their time they are willing to deal with, the hassle of using a public boat ramp when it's really crowded.

DR. STEMLE: I've got a particular kind of thought. With the monetary investment spent by recreational anglers, I think it would be interesting to see what citizen science could do to kind of look at what the duration of durable goods for recreational anglers is, and like basically how many years do we expect for them to hold on to what we consider a durable good, like a fishing rod or a boat or a trailer, and how often we need to kind of be updating those estimates when we include them with trip-based costs that we do for economic analysis of the rec sector, and so that's kind of one of my ideas.

MS. BYRD: Thanks, Adam.

UNIDENTIFIED: I was just going to throw in that NMFS does a really good job with that, Adam. There's some stuff put out, and I am forgetting who the lead author is, and they only come out about every five years, but they do really good reports on marine recreational boat trip expenditures and durable goods expenditures. I would have to look back through them, to see if they have any useful life information, but there is pretty good data out there, but I just wish it was more frequent.

DR. STEMLE: That's kind of the second point that was getting at, is I have seen the separation of the two in those papers, but I can't remember the last time that I've seen an update to any type of durable good expenses.

DR. CROSSON: Okay. Any other comments? Julia, if you're all right with this, I think we're concluded with this particular segment of the meeting.

MS. BYRD: Yes, and I will just say thank you, guys, for letting me give you guys an update, and I appreciate all of the feedback that we've gotten, and I will kind of follow-up with a few of you who have provided comments as we kind of move forward with some of our projects and work, and so thank you so much.

DR. CROSSON: Jennifer, are you good to go, or do you need a minute or two to setup?

DR. SWEENEY-TOOKES: Christina is actually running my slides for me. I just have to run my mouth, and so, whenever you all are ready, I am.

MS. WIEGAND: I've got the slides, if someone would throw presenter back to me. I'm clicking on the show-screen button, and it doesn't seem to want to let me do it.

DR. CROSSON: All right. While you get that set up -- I would like to go through that one, and then I know that lots of this is just informative, and Jennifer will talk about what they've been doing on the Georgia coast, and then, after that, we'll try and take a break and move to allocation, and then we'll continue that after lunch as well, the allocation.

A SOCIAL CENSUS OF GEORGIA'S WORKING WATERFRONTS

DR. SWEENEY-TOOKES: Thank you for putting this on the schedule today and for giving me a chance to talk to you about this research that we've just -- We're wrapping up right now, and so this was a thirty-five-month project that was undertaken by Tracy and I, Tracy Yandle, who is at Emory University, and she's a political scientist, for those of you who are new to the panel, or don't know her, and she does fisheries policy. We were also collaborating with Bryan Fluech, who is the Associate Marine Extension Director for Georgia Sea Grant and UGA Marine Extension, as well as Gina Shamshak, and Gina is a fisheries economist at Goucher College.

We proposed this project originally because we really weren't finding a lot of current data on the Georgia seafood industry demographics or economics or social conditions, and so we were looking to fill those gaps by investigating the current demographic, economic, and social conditions of the industry and how those compared to historical trends, and then, also, labor supply conditions for the industry and strategies to address what we were hearing was a very distressed workforce and aging of the fleet.

We connected what we're calling a social census of the working waterfronts, to give this snapshot of the seafood industry and to assess those changes, and there were a lot of educational impacts to this work as well, and I will just pop that in there, and we incorporated numerous undergraduate researchers and volunteers and graduate research assistants at two different universities, and so we worked closely with the fishing industry as well, to try to identify concerns voiced by them and look for best practices to remedy some of these issues. We did case study analysis to set it up, and, ultimately, we have ended now with some key recommendations going forward, as to things that would be of use to the fishing industry of Georgia.

This is just a really quick snapshot of the six different data methods that we used of gathering data to combine to provide a comprehensive approach, and so we were using multiple methods for each of these two research questions and really systematically trying to triangulate amongst these data sources, to make sure we were looking at multiple angles of information to each of these different questions, and I will talk a little bit on the next slide about what these things looked like.

We were using both qualitative and quantitative methods, and we wanted the quantitative, the survey responses and historical data, to be complemented by the richness, the why, of qualitative strategies, such as interviews and participant observation, and we were using participatory research to really emphasize the involvement of local people in the research, because, as we know, seafood industry insiders have an enhanced ability to identify the key elements of the problems and possible solutions.

We started off, and this is roughly chronological, and there was a lot of back-and-forth though, but we'll start off though with the mapping infrastructure. One of our primary goals was to create a census of the industry infrastructure. Like Julia just mentioned on that last presentation, there really wasn't any current industry infrastructure documentation for coastal Georgia, and this was really difficult. There was an absence of contemporary accurate data, and we had to creatively rely on some historical and some anecdotal evidence.

Previous studies that we found were often contradictory, and so we were working mainly from a 1975 dock census that identified thirty-one commercial docks in Georgia, and then were also drawing on Benjamin Blount's 2000 work that was citing twenty-one docks in Macintosh County alone, and so we were working from historical data as well, and we were looking at secondary sources and historical records, published literature, property records, and we were trying to identify where the previous locations of all those docks and fish houses and other infrastructure was, and then we also went through public records and a lot of the interviews that we had done and working through key informants in the state to try to identify currently-active fishing infrastructure.

This really concentrated, in 2019 -- Tracy taught a semester-long course on coastal Georgia geography, history, and politics of fishing culture for the environmental sciences department at Emory, and then, during their spring break, she led us, our brave leader, down to the coast, and we took I believe it was ten or twelve students to do a week of really intensive field work during their spring break.

We literally drove and worked the entire coastline, and we went to every location where there had been a historic dock or we were told there was current infrastructure, and we geocoded each of those places, and we dropped GIS points, and we gathered spatial data, and we created photographic records of the current conditions of each site that spring, and then, since then, that information has been spatially analyzed, and it's been mapped, trying to identify and illustrate not only what is there now, but then the changing patterns of industry activity and the related land use along that whole coast.

We also then, sort of overlapping with that time period, did mail surveys, because our previous work told us that this was not a very technologically-inclined group of folks who were commercially fishing in Georgia, and so went old-school and did mail surveys, and I will talk a little bit more about them in a minute, but we were interested in surveying all of the key participant groups in the seafood industry, and so we turned to Julie Calif at the Georgia Department of Natural Resources, who gave us what was identified as the state database of individuals who held commercial fishing licenses for finfish, shrimp, shellfish, and crabs.

With that list in mind then, we developed a questionnaire warning postcard, for a couple of purposes. First of all, just to alert license holders that these mail questionnaires would be arriving soon, and the literature shows this improves response rates, and then, secondly, also, to determine

which of those addresses in the database were no longer accurate, and so we could hold off on mailing this somewhat expensive questionnaire to them.

We also did qualitative interviews, open-ended, and they were individual, for the most part, and some people chose to be interviewed in partnerships, with individuals across each sub-population, and, again, I will show you the sample size on the next slide, but we were using purposive sampling here. We were trying to seek out knowledgeable individuals and then snowball sampled from them, because the initial contacts thought that those new participants would be informative to us, and, of course, we're using semi-structured interviews, because they give you a deep understanding of the research topic, and they encapsulate the experiences of those individuals. They are open-ended, and they allow for new information to emerge, even though we're following a general script, to make sure we're covering all of the desired topics.

Where available, we also did secondary data gathering on key social and economic variables, and we were looking at federal, state, and local government websites, reports and repositories, the U.S. Census Bureau, NOAA's Digital Coast, Georgia corporate records, Georgia Department of Natural Resources, and we also look at other fisheries-related sources, like the Pew Trusts, World Bank, and other academic, research, and historical sources like the Georgia State Archives.

We visited the local archives at each of the small county libraries as we worked our way up the coast, and so we went to the Brian Lang Historical Archives in Camden County, the Ida Hilton Public Library in Macintosh County, the Bull Street Archives in Chatham County, and so the data gathering particularly was carried out, a lot of it, by students, but being really closely supervised by Tracy and myself and also research library staff at Emory.

We were doing participant observations throughout this project, and this is a really deliberate set of observations and recording of observations that takes place while life is happening, while you are in locations where the people you are studying are, and so we were looking at interactions between people and non-verbal communication and what themes and topics were of interest to each group, and we were doing this participant observation for hours and hours and hours on fishing docks and in fish houses and fishers' homes and in their backyard seafood processing operations.

We were in the processing facilities for small and large seafood distribution companies, and we were out on the shrimp research vessel, the Georgia Bulldog, and we were in oyster flats, on an oyster harvester's oyster skiff, and we were in retail and wholesale seafood spaces across six counties, and really did this over the last seven years, and so that was not just during the time of this project.

During that time, we had numerous informal conversations with local extension agents and state and federal employees and management staff and chefs who were interested in purchasing Georgia seafood, and those sort of let us confirm, through those casual and unstructured interviews, and also those interviews -- The casual and unstructured interviews with fishing community members throughout that period, and so all of that kind of helped us frame and contextualize the twenty-three in-depth interviews that we did for this project between February of 2018 and February of 2020.

By repeatedly and consistently just emerging ourselves in these communities, we were able to gather data beyond what was simply reported to us in a mailed survey, or in the context of these interviews, and, again, we're recording observations of behaviors and interactions, to be able to compare that, and so the data that comes out of the interviews, and then triangulate that with the reported data in the surveys and what we --

Then the last component were case studies, and we were looking for workforce development programs that we studied as models for the Georgia seafood industry, and many of them came out -- The ones that we concentrated on for this particular project were extreme -- The North Carolina Sea Grant, there is some really amazing work at North Carolina Sea Grant, and Coast Watch, the Farmer Veteran Coalition, and then even a Caribbean fisheries training program.

Just to briefly reiterate there, our sample size for this particular project was happening across these six coastal counties that you see on the map here, and the mail surveys -- Sadly, although we went out 792 mailed surveys, each of them containing a one-dollar bill, because the literature indicates that increases return rates, we got ninety-one surveys back, and so we were adding that then to the qualitative interviews that are really the focus of the data for this particular report.

In keeping with that multidisciplinary nature of the research team of the project, we were using five different data analysis methods. We were using qualitative data for anthropological and policy analysis, because that data from participant observation and interviewing helps us better understand the why and the how of human behavior, and so this is incorporating audio interviews, transcription of those interviews, review and thematic coding of it, reviewing of field notes from participant observation, and then reviewing the themes that emerge across all of the methodologies of the project, and so, while this sample size is low, and I know, for an economist, horrifying, for anthropological analysis, or a culturally-rich analysis, this is sufficient. It's not as much as we would like, but it's sufficient.

We did also engage in social network analysis. Our graduate students on the project developed social network research tools, and we really hoped this data would provide us with modeling of the figures in the Georgia seafood industry who people deemed the most reliable or forward-thinking, but we knew this going into the project, and the social network analysts attempted to reinforce this, that there really is just an utter lack of collective trust among fishing community members in Georgia. Many people did not want to name names, and didn't want to admit that they knew people, and they simply wouldn't answer those questions, and so the social network analysis resulted with two or three key people who we already would have identified as being sort of the core of the industry, and it didn't really give us any new insight, sadly.

Our quantitative data analysis, we used that for economic and policy analysis in the project, and, here, we were looking at the mailed questionnaire and other secondary data sources, like the Census Bureau, to do statistical analyses, where possible, and I will pause there and say, between the quantitative and the economic data analysis, we were able to quantitatively document sort of some information about the current state of the fishing sector, and we were able to make some statistical comparisons between fisheries, and this is not my piece of the pie, and so I know Gina Shamshak, the economist, would love to answer any economic or quantitative questions. Feel free to share them with me, and I will pass them along, but I will not give what I am sure would be a satisfying answer to anything really specific on the economics, and I'm sorry.

Lastly, with the spatial analysis, it was the geographic data on the current and historic conditions of the industry, and we were mapping the change in locations over time, and then we topically linked those to the survey results, to better understand the relationship between the seafood industry economic activity and the characteristics of the industry participants and the broader communities.

I am going to jump here right to our findings and the so what of the project. At the end of these thirty-five months, what emerged was, in some cases, very unsurprising, but, in some cases, it was unexpected, and the first one is that we found that there are actually far fewer active commercial seafood producers and harvesters than the DNR data makes it appear that there is, in not a few cases.

Individuals have or intend to use their permits to catch commercial quantities of seafood, right, to sell it to make a profit, and I think that's what most of us think about when we talk about commercial fishing, but, in a surprising number of cases, we found that individuals with commercial fishing licenses were not interested in this sort of movement of product at all, that in fact what they wanted was to be able to catch more seafood than what is allowable under recreational harvest limits, or they wanted to use different gear than was allowed under recreational fishing regulations, and so they really were just catching shrimp for their family, and maybe the family next door, but they couldn't use a certain method, or they couldn't use a certain gear, or they couldn't take that much, and so they had to get commercial fishing licenses to do it, and they found it feasible to do so.

What our recommendation was, out of this finding, was that we really would love to see more nuance in data recordkeeping, and we're not entirely sure where this decision-making about how this is sorted comes down, and I'm sure that we could get some interesting feedback here, and I'm looking forward to it, but there really needs to be more nuance, so that we better understand what's actually happening in commercial fishing, versus those who have commercial fishing licenses. Standardized documentation about what information is publicly available from DNR, and then clarification about fisher intentions to actually commercially sell seafood might really change our perspective on what's happening in commercial fishing in Georgia.

Another thing that arose, that we were really not expecting to find, was that, according to many people involved in the industry, changes in the local ecosystem and the environment are, they feel, one of the key impacts to the seafood that's available to resource users. We listened to repeated observations by crabbers, from shellfish pickers, and from shrimpers about environmental impacts that they felt were affecting nursery grounds in creeks and marshes, and they felt that they had made these observations time after time, and they weren't valued, and they weren't being heard, and so like, for example, this came out a lot amongst crabbers, that draining of inland marshes, to be used for pine agriculture in Georgia, they felt has really changed the salinity of the downstream waterways and reduced the habitat for crab and shrimp nurseries.

It's, of course, also possible then that the biomass in the most commercially-important species have declined over the past few decades. As we understood it from working with Bryan, the blue crab biomass isn't actively tracked. The last blue crab management plan was crafted in 2008, and so crabbers really felt that increased harvest of softshell crabs could be impacting the size of the subsequent crab populations.

Now, shrimpers, who are shrimping both in state and in federal waters, are really concerned about what looks to them to be an apparent decline of the visible quantity of shrimp. Interestingly, these concerns are not often raised publicly. They don't mention this, because they are afraid that, if they say there is less stock, that this might result in further restrictions on the industry. They're afraid of further gear restrictions, seasonal closures, or beginning limited-entry licenses, and so this was sort of a little bit of a sticky issue, because they were worried about this, and they would bring it up, but then they would backpedal and say, well, but I'm sure it's fine, I'm sure it's fine, and talk about how they were fearful of new regulations coming down on them.

After listening to this, and then all of the team conversing, what we really would recommend at this point is that there needs to be, of course, not new, but continued effort and enthusiasm for incorporating fishing-industry concerns into environmental management and not just fisheries management. The cultural and political perspectives of some fishing communities, especially in Georgia, make them unlikely to concur with science that appears environmental, quote, unquote, or politically biased in any way, and so this is really a place where social science has to think about really carefully designed studies that appeal to shared common concerns about local land, local waterways, and local marshes, and that sort of appeal holds an opportunity for really long-term, meaningful collaboration between the local communities who are spending their lives in the ecosystem and the scientists and agencies and organizations who really do hold similar goals.

At the end of the day, our thoughts and our desires for the biomass and the ecosystem are similar, but the way that we talk about it can be different, and that's very off-putting for them, and so, of course, since the shrimp and crab industry are financially important to the coast, and their product is dependent on healthy wetlands, it's really vital for the success of the industry that Georgia coastal wetlands are appropriately managed and preserved, and all we have to do is look at the Gulf of Mexico to illustrate how important that connection is.

Coming again to one of the points that Julia made, this infrastructure is really dwindling, and I know it's hard to see on this slide here, but you can see, in 2019, every red dot you see there is a dot that used to be open in Georgia and is now closed, and the green dots -- I think one of them was new, but the rest of them are the only remaining docks from that 1975 census, and so this infrastructure is dwindling really quickly, and there are no public or municipal dock options in Georgia. The industry relies entirely on privately-owned docks to sustain operations.

With the decrease in privately-owned dock space to support fishers, there just won't be sufficient capacity to keep boats running, or to keep boats stocked with ice, or to offload most of the product, and we have seen, and we observe, that this deepwater waterfront property really demands high property taxes that are very difficult to support on that small profit margin that the docks and the fish houses receive, and, across those hundred miles of coastline, there are only two remaining railways, and only one of them can handle the really big steel-hulled freezer boats, which the industry is increasingly adopted.

Of those thirty-one docks identified in that 1975 survey, thirteen are still operating. There are two docks that were not identified in that initial study, and so this is a decline of over 50 percent, but there's no discernable pattern that we see in these dock closures, and it doesn't appear to be driven by a locally-based cause. Rather, they reflect the overall decline of the fishing industry.

As far as recommendations go, we would really love to see some local and state policy interventions to preserve that infrastructure. We did not find any evidence of this in practice, and so, if it's not already in current practice, in urban or in gentrifying areas, we would recommend taxing active working commercial fishing docks at a lower rate than the nearby residential properties, since they're often quite luxurious. State and local governments might consider provisioning municipal commercial docks, including access to ice and fuel services. We see that in Louisiana, and so it is viable, and this is a way to preserve not only the industry, but also local culture that attracts tourists and residents.

This one was one of the more interesting findings. We had been told, over and over, that good crew was impossible to find, and what we found, after systematically examining this, is that older, smaller boats are not able to attract the quality of crew labor force that the younger captains with larger boats who stay out longer are attracting, and so what we were finding is that the volume of the product, and then, therefore, the crew share of the landings, really has to be appealing enough to balance the required time offshore, and that intense physical labor, and so, again, the larger boats with younger captains, who take longer trips, were not having any trouble finding crew. Rather, it was these older, smaller boats that would only go out on day trips did.

What we're really seeing here is that these smaller dayboats may be able to better compete on quality, rather than quantity, and this sort of ties into our previous work in Georgia on direct marketing of seafood, and so, really, a shift of focus onto quality might then allow them to -- It probably, actually, would allow them higher margin opportunities, through that direct marketing, because these higher profits would allow them to hire a more qualified workforce, and so it was not what we expected to find. We expected to find there was indeed just an industry-wide shortage of crew, and that's not what actually played out.

I think my last slide just thanks and acknowledges our funding from Marine Extension and Georgia Sea Grant, our very last one is our faces, in case you need to throw anything at this point, and, also, any research artifacts from any of our research products, we do put up onto that website that you see there, workingwaterfronts.org, and feel free to email me personally if you have anything that you didn't want to bring up, but I am going to stop talking now, and I would love to answer questions, and I'm a little nervous about what sorts of economic questions you all are going to have for me.

DR. CROSSON: That was a very nice presentation. Are there questions, comments, or accolades for Jennifer?

DR. SWEENEY-TOOKES: Thanks, Scott.

DR. DUMAS: That was a really interesting presentation. One of the things I'm interested in is what types of information did you find from those little county libraries? Did they have any information that was useful to you that other data sources couldn't provide? What stories did you learn from those little libraries? Thanks.

DR. SWEENEY-TOOKES: Actually, stories is a great way to ask. What we found was a lot of information about changes in ownership or explanations of really fuzzy public ownership records. We really wanted to be able to trace the ownership from the 1975 dock census to what we were currently seeing in 2019, and it was really difficult to find that data in records that students could

access sitting at their computer, and so it allowed us to fill in a lot of holes on the stories of the docks and who had owned them and why.

I wouldn't say that it necessarily turned out to be a tremendous amount of revolutionary data that we're going to run out and publish right away, but it was very engaging for the students, and it sort of changed their approach to doing the research and to doing the gathering of the data and their interactions with it, and so we found it very valuable for that, and because this sort of puts together the background to the whole history of commercial fishing in Georgia that Tracy and I have been sort of chasing for almost a decade now.

DR. DUMAS: Thanks.

DR. STEMLE: I just wanted to say that this has been fantastic, and you all have done an absolutely amazing job with this. I wanted to ask, have you gotten any perceptions from the local county government on their unwillingness or their hesitation to develop new working waterfronts, because I know one of the contentious issues, when I was at Georgia, was the idea that they developed Mary Ross Park in Brunswick, which is next to, as you said, one of the only working railroads, and that, behind the original idea, it was supposed to be a working waterfront.

Then, when the shrimp boats started docking up there, there was a huge outrage, because they're drinking, and they're smoking, and they're cursing, and it generally looks unsightly to the local government, and so they shut that down, and they squashed it, and all of the shrimpers vocalized their displeasure with that, saying that was supposed to be our space, and now --

Essentially, it's hard to pinpoint where this problem starts, because, from that, they go and they say that we're forced to basically go to only one or two shrimp houses left in the county, and they set the prices, and we can't do anything about that, and so I was wondering if you had collected any opinions from the local governments on whether or not their -- I guess their priorities are whether or not they are looking to develop the waterfronts for more residential purposes, for tourist purposes, and they're kind of generally wanting to push the commercial fishing away from the tourist destinations, essentially, like Jekyll Island and like St. Simons and things like that.

DR. SWEENEY-TOOKES: I love your question, Adam, because you know. You know exactly what's going on. Something that's always struck us about the Mary Ross, which was the only municipal dock, which they won't allow shrimp boats, and isn't there criteria that you have to have X amount of insurance on shrimp boat to be able to dock at Mary Ross now?

DR. STEMLE: I couldn't tell you, off the top of my head, but Bryan could probably tell you that.

DR. SWEENEY-TOOKES: I will have to ask him, but I'm pretty sure that was the criteria they came up with, right, which everyone then understood meant that no more shrimp boats could dock there, because none of them have any insurance, and you're right. That was a problem, and that's not really scenic. What's interesting though is that the industry has changed since then, because I'm pretty sure that was in the 1990s, that they were allowing people to dock there, and that was still very much -- Sorry.

DR. STEMLE: I was just agreeing.

DR. SWEENEY-TOOKES: So that's still very much in the heyday, and most of the shrimpers who are shrimping now do remember shrimping in the 1990s, and they thought that things were going really well. What's interesting now is that most of the people who are shrimping -- I don't think they're going to be hanging out at the dock cursing and smoking too much anymore, just because most of them are older, right, and so that's one thing to think about right there.

As far as the county governments go, we're still in the outreach stage, and I literally have my fact sheet for county government sitting on my to-do list still, and so we haven't had that interaction, but it's a great question, because, when we propose projects like this, or when we talk to people like on city councils or some of the other sort of local extension agents and the decisionmakers in the coastal counties, they are very supportive. They are very supportive, and shrimping is very important, and it's key to our culture, and it's key to our heritage, but you're right.

Then they're making decisions like not allowing anyone to dock at the one municipal dock, or I'm thinking, right off the top of my head, there's one of the shrimp docks, or docking areas, in Georgia is in Darien, and they just zoned and allowed for some of the most historic docks to be torn down, and now they are --

DR. STEMLE: (Dr. Stemle's comment is not audible on the recording.)

DR. SWEENEY-TOOKES: Have you seen them? There's even a fancy restaurant.

DR. STEMLE: I've seen the construction process up there, and it's crazy, because it's right next to the shrimp boats, and all I can think about is that's not going to last five minutes when people actually move in and have to see them offloading seafood, and there are seagulls, and it smells, and things like that.

DR. SWEENEY-TOOKES: Exactly, and so there's so many opportunities for the way this could be developed, and there are people who do really amazing sort of working waterfront integrated plans in other parts of the country, and I think our sort of lofty, big-term goal in Georgia, our hope anyway, would be that that sort of working waterfront could be developed, whether it's in Darien or whether it's in Brunswick, but there is an opportunity to make it cleaned up enough that tourists would want to come and walk to that pathway, like there is Darien right next to the shrimp boats, but also to really sort of still support and facilitate an actual operational dock, and that's where the rub is, right? It's like the coastal counties can't quite decide what they think.

I mean, on one hand, we want the shrimp boats here, and we want the seafood. Our tourists want the seafood, and they come to see these shrimp boats, but, on the other hand, they stink, and fishers curse, and so how do we marry these two things together?

DR. CROSSON: Any other additional comments? I do want to take a break here in a minute, and I don't want to cut off Jennifer, but I want to take a break here in a minute, before we move to allocation.

DR. DUMAS: I have a quick question. We just did a survey of commercial fishermen in North Carolina, and it was a census survey, and one of the things that I found interesting was the number of commercial fishermen who do not use a vessel, fishing boat or vessel, of any kind to commercially fish. They're going after oysters, clams, crabs, maybe some shrimp off the shore,

or off piers or docks, and I think it was a similar phenomenon to the one you mentioned about folks are getting seafood for themselves, or for their families, and they want to use a different type of gear, or maybe have a larger catch be allowed with recreational. I was wondering if you found a similar thing in your look at commercial fishermen. Did you see a lot of folks fishing without a vessel? Thanks.

DR. SWEENEY-TOOKES: That's really interesting, Chris. Were the folks that you were finding that were fishing without a vessel, were they selling the seafood, or was it for their own or family consumption?

DR. DUMAS: Both, but the large number did have positive sales, and so trip ticket sales, and so they were selling some, but not necessarily a lot, not necessarily large-dollar-value annual sales, but there were a lot of these commercial fishermen fishing without a boat in North Carolina, and that was kind of interesting, because we were also asking questions about how do you respond to storms, storms like hurricane strikes, and what wind speeds would prevent you from fishing, things like that, looking at climate change, potentially, and the interesting thing is they were more resilient to like higher winds and waves than the fishermen with boats, as you might expect, because they didn't have a boat, and they didn't have to worry about that. Also, that's a large fixed cost that they don't have as part of their business operation, an expense they don't have, and so it was kind of interesting, in several ways, and I was just wondering if you saw similar things in Georgia. Thanks.

DR. SWEENEY-TOOKES: Not at all, and I'm totally fascinated by this now. Were they in some of the larger cities, so that they could take that catch like straight over to some restaurants in Charleston or straight to some urban areas?

DR. DUMAS: This is North Carolina, but, no, they were spread out. They were in rural areas, and there were some in more urban areas, like Wilmington and Morehead City, but they were also in very rural areas. They were spread out all over the North Carolina coast, but they were I would say like 25 percent of all commercial fishermen, something like that.

DR. SWEENEY-TOOKES: With no vessel. That is fascinating. No, we haven't heard that at all, and now I'm completely fascinated by this, because even the ones who are picking oysters, because we don't aquaculture oysters -- Even the ones who are picking the oysters or are crabbing have at least a small vessel to get around, and so that's fascinating.

DR. DUMAS: Right. It's interesting, and so thanks.

DR. SWEENEY-TOOKES: Thanks, Chris.

DR. CROSSON: Okay. Thank you very much again, Jennifer, for that presentation. Let's take a break until like five after eleven. I see 10:54 on my laptop, which may be not quite accurate, but we'll start up again at 11:05, and so let's take a break for ten minutes, okay?

DR. SWEENEY-TOOKES: Thanks for the time, everyone.

(Whereupon, a recess was taken.)

DR. CROSSON: I think we're ready to get going here, and so this is the biggest agenda item that we have for this meeting this year, and I have lots of people trying to keep tabs on this, and the people that I put on this I didn't put on anything else. Kurt has got a scheduling conflict, and so he's not going to be present for most of this, but Chris and Jason and Andrew, and everybody else too, and I'm going to try and keep notes on this, because this is not a small one.

I guess we'll do the presentation, and then we'll see how much of the discussion we can get into before lunchtime. Whoever is doing the presentation from council staff, you're ready to go?

MR. HADLEY: Yes, I'm ready to go. Thank you, Scott, and, as a general game plan, do you want to try to go until around noon, and then we'll find a good stopping point and come back to it after lunch?

DR. CROSSON: That's my plan right now.

DRAFT ALLOCATION DECISION TREE BLUEPRINT

MR. HADLEY: Okay. Sounds great. Thank you for that. Also, I was remiss earlier in not introducing our two council members that we have online, and we have Mel Bell, who is the Chair of the South Atlantic Council, as well as Steve Poland, who is the Vice Chair of the South Atlantic Council, and so I just wanted to mention that they are online and with us today.

As Scott alluded to, this is very much a big-ticket item for them, and it's something that we've been developing over the past several months and will look towards finishing later on this year, but I know that they're certainly interested in this, as well as the other council members, and we'll look forward to your recommendations and your comments now, as well as the written report.

Without further ado, I am going to be starting the presentation on the proposed allocation decision trees and the draft blueprint that we've laid out applying biological, social, and economic consideration in allocation decisions. By we, we have a cross-disciplinary and cross-institutional, if you will, group together that has been working on this, and this is Dr. Mike Schmidtke, Christina Wiegand, myself, Dr. Scott Crosson, Myra Brouwer, and, also, Dr. Brian Cheuvront, who is now retired, but, prior to his retirement, he had put in a lot of work on this in getting it started, and so that's the working group that has been helping put this together.

As a little bit of an introduction, the council has been making allocation decisions really for decades now and basing these allocation decisions on different sets of data, as they have come to them, but there have been several recent events that have brought allocations -- It's always kind of a sticky issue, an important issue, and potentially controversial, but there's been a few, two main events, if you will, that have brought allocation to the forefront of the council's discussions.

One is a report from the GAO on fisheries allocations in the Southeast, and so this focused on allocations in the Gulf of Mexico and the South Atlantic, on the federal fisheries management side of things, and the council staff, as well as council members, certainly worked with the GAO closely in developing that report that eventually came up with a set of recommendations.

Really, some of those recommendations included the GAO's suggested methods that councils develop for analyzing sector allocation needs and the needs of different sectors, as far as looking at trends in catch and landings, stock assessment results, economic analyses, social indicator analyses, and ecosystem models.

You have the GAO report as a major recent event, and the other, as was alluded to earlier, was the major shift in the methodology for the Marine Recreational Information Program and so, specifically, how effort estimates are calculated by MRIP. The program has changed its methods in estimating effort, and this applies going forward, but it has also recalibrated the historic landings dataset on the recreational side, and, if you go through the history of the council's allocation decisions, a lot of those are based on landings, and so it's almost like you shifted your baseline and how to reconcile that with allocation decisions moving forward, since your historic dataset has in fact changed.

The overall goal of this is to help the council develop an approach in addressing their upcoming allocation decisions that they will really be looking at for the next several years, and this approach would apply a consistent method in an objective manner that could potentially be applied across all species.

The general request of the SEP is to consider the proposed decision tree approach and provide general feedback, and we'll go through a series of draft decision questions, and we'll also go through questions on the structure of the approach and get your feedback on the potential utility of the approach, and I will mention that we'll get into some more details on the timing of this tool, but this is something that the workgroup has been working on with the council, and taking the council's guidance and formulating the different decision tree questions, but we wanted to bring it to the SEP early in the process, to help calibrate the approach and calibrate the questions, particularly from the overall kind of high-level standpoint, and then, of course, naturally, from an economic and social standpoint.

A little bit of additional background on allocations and allocation decisions since the last reauthorization of the Magnuson-Stevens Act, which required the establishing of annual catch limits and kind of threw the council into -- Or forced the council, so to speak, into establishing sector allocations when establishing these annual catch limits. Landings have been the primary data source used for allocation purposes, and so the most consistent data available has been landings data, and, there again, with the reauthorization of the MSA, the council was using this consistent data source of landings that can be obtained for all species as, by and large, the primary source for setting sector allocations, particularly looking at historic landings.

In most cases, the council has not necessarily been able to utilize other sources of data other than landings when examining allocations, partially because the data, at times, can be lacking for the South Atlantic region, but, also, there's not necessarily a consistent method to apply the concept across all species, and so that's one of the issues that we're hoping to get at through this decision tree process.

Currently, the council is considering sector allocations in a systematic manner without specific time constraints that they had previously with the MSA reauthorization, and so, while these decisions are certainly coming up on the horizon, the council has a little bit more time to work with in considering different approaches and different methods.

Looking at recent council action, in March of 2020, the council had a very in-depth discussion on allocations and identifying criteria that they're interested in considering in future allocation decisions, and this included landings history, discard rates, accountability of the sector, fairness, equity, market needs, importance of a species to a sector, cultural importance, and the possibility of removing sector allocations altogether.

This discussion -- After identifying these general topics and general interests, the council again discussed allocations at their June 2020 meeting, and they were presented with readily-available criteria that relate to those outlined considerations, and really they looked at outlining considerations for allocation decisions that are an approach to looking at this in a systematic manner, and, really, this involved developing the decision tree approach.

The main objective is to create an organized approach to allocation decisions going forward, and, in the council's discussion of this, they really wanted to come up with this systematic approach, but, at the same time, they did not want to be overly prescriptive, and so they wanted to maintain flexibility to address allocations on a species-by-species basis, and that's an important point that we'll come back to in some of the discussion questions for the SEP.

Generally, looking at the decision tree approach, it uses the same question pattern, or tree, for each species considered, and the branches, so to speak, come off of each question and directs to the next question to be answered, and so sort of a systematic approach to that, and it's intended to allow the council to identify the most important factors for a specific species, based on the available data, when making sector allocation decisions.

We'll get into the details of this in just a bit, but, as a general overview, the decision trees are a slightly modified version of the original GAO criteria definitions, as well as the general topics that the council identified, and generally data points that the council identified, in wanting to examine when making allocation decisions, but, overall, those four overarching factors are looking at landings history, stock status, economic factors, and social factors.

Each species would pass through all four of these decision trees, and some decision trees may not be relevant, given the outcome for a specific species, and so, really, it will be dependent on the data available for a species or how that species may be being utilized in a fishery, and so a question in one decision tree could be applicable to another decision tree as well. For example, landings, as you will see, comes up quite a bit in some of the overarching topics, looking at landings history, economic factors, and social factors, and you'll see a consistent theme there, when it comes to landings.

With that, I'm going to turn it over to Mike Schmidtke to walk you through some of the biological and landings-related questions, and then we'll hop into the economic questions, and then the social questions. Mike, whenever you're ready.

DR. SCHMIDTKE: Thanks, John. I'm going to be walking through the first two decision trees, first looking at landings, and then, after that, we'll move into stock status. Starting off with landings, that's been kind of the basis for most allocations that are in place right now. The first question that we ask related to this is should future allocations be based on harvests that are impacted by previous or current allocations?

One of the reasons why this kind of came up as the first question is because most of those allocations were set through the Comprehensive ACL Amendment from 2012. Prior to that, several fisheries did not have quotas for both sectors, and there wasn't an allocation strategy in place, and so the Comprehensive ACL Amendment put in place a weighted average from the years 1986 through 2008 and more recent years of 2006 through 2008. That basically allowed allocations to be set on a time period where they could, quote, unquote, naturally -- When the landings could naturally play out and allocate based on that.

Now, moving forward, the landings from that time period are over ten years old, and they're getting older, and we're still going to be processing, for quite some time, some of these allocation processes, as a result of the MRIP data change and upcoming assessments and all of that. At that time, the fisheries may have changed quite significantly, and so that first landings-based question would need to address whether the council would want to keep the mindset that was used for the Comprehensive ACL Amendment of how sector landings would naturally play out, with the caveat that the data that they would be working with is older, prior to sector allocations, or they could choose to use more recent data that may have been impacted by allocations.

If the council does not want landings to have been impacted by allocations, then they could pick a historical time period that's representative of the status that they want to see in the fishery and reference the landings composition from that time period or do some type of averaging similar to the Comprehensive ACL Amendment.

If the council wants to use more recent landings that may have been impacted by allocations, then they would need to consider how the sectors have met or been closed, due to meeting their respective ACLs in recent years. We have picked a five-year timeframe, and that's something that could be discussed, if that creates an issue. At least I didn't have any specific tie to five years, versus another number, and it's just something that came up.

The options related to that are whether both sectors, one sector, or neither sector seems to be being impacted by the allocations that are in place. If both sectors are being impacted, then this wouldn't be as much of an issue of change the allocation, because both sectors are harvesting their ACL, or both are feeling impacts of the ACL, and there isn't really a surplus, so to speak, on one side that can feed a deficit in the other.

If only one sector is harvesting their full ACL, and the other is significantly underharvesting their ACL, then there may be some discussions to be had about reallocating some of that difference from the overharvesting sector, or the one meeting the ACL, to the -- Excuse me. From the underharvesting sector to the one that's meeting its ACL. If neither fishery is harvesting its ACL, then the ACL hasn't been a limiting factor, and so you could do something that's a bit more akin to that Comprehensive ACL Amendment approach, where you look at how these fisheries, these sectors, are naturally playing out.

You could also look at trends of growth within the sectors, to see if that would be indicative of some type of movement in the composition of the fishery, and that's something that could be considered in these discussions.

Thinking of the analysis that would go along with addressing these type of questions and these discussions, we would look at landings and the ACL by sector along time series that is defined within those, and then we would also have to consider any type of ACL-induced closures, the frequency of those, what years they occurred, possibly if there are extraordinary events that caused those closures, or if they're kind of an annually-recurring type of thing, and those would all need to be factored into the discussion as well. John, do you want to just move through all the topics and then come back to questions or pause for questions after each?

MR. HADLEY: It might be best to just go ahead and move through the topics, and then we'll stop maybe at the end of the bio-related questions and then before we hop into the economic-related questions, and does that sound good?

DR. SCHMIDTKE: Yes. It works for me. Then we'll go to stock status next. The first big question related to stock status is has it been determined, and we have many species within the South Atlantic that don't have an official stock assessment on the books that is supporting a status, and so we would need to address that question and kind of separate out whether these allocation discussions related to status, whether they're referring to species that do or don't have a stock assessment supporting them at that time.

Then we go through the different statuses that are available, and so, if a stock is overfished and overfishing is occurring, then general advice resulting from that could be to prioritize reallocation towards a sector, if that could increase the biomass, via increased survivorship of juveniles and adult females, or decrease dead discards, and that's kind of a recurring theme that we initially were thinking along the lines of stock status, is, if we're trying to help -- If we're trying to help boost a population in some way, those are really the two factors that we could attempt to address via allocations.

The next status of a stock being overfished, but overfishing is not occurring, then allocation would be prioritized towards a sector if doing so could increase the biomass, via that increased survivorship. If the stock is not overfished, and overfishing is occurring, then we kind of have another branch of the tree asking if one sector is typically underharvesting its ACL. If the answer to that is yes, then then advice would be to consider reallocation from the underharvesting sector to the overharvesting sector, but, again, operating within that difference of the ACLs, and so there would be a limit on how much of that total ACL can be reallocated.

Then that second line of advice is also consider other measures to help the overharvesting sector achieve its ACL. That's kind of highlighting something that will get brought up a little bit later. A lot of these factors that we're considering in the decision trees, we're trying to address things from an allocation perspective, but, in some cases, there are other types of restrictions that could go along to help that or could probably more effectively address some of the issues that are popping up in some of these fisheries, from a landings and status perspective, at least.

If neither stock is typically underharvesting its ACL, then the prioritization could be towards reducing dead discards, and that would be comparing the sectors in terms of -- Probably if there is a different use of gear or differences in fishing behavior or something like that, and so, if there's a way to reduce dead discards and make the fishing more efficient, then that's something that could be prioritized in those discussions. Again, other measures could potentially help that effort.

Finally, if -- Actually, this branch probably needs to be pulled back out of this status of not overfished and not overfishing. That is kind of the no-problem status, and, from that, we would consider maintaining the current allocation, or, if there is reason to allocate, it would be due to some other factor and not due to the status.

If stock status is unknown, then kind of the next step down that we were initially thinking is that maybe there is an adequate index of abundance that would give some indication of population trends, and this is kind of an approach that's used in data-poor stock assessments and things of that nature, and so, if we have that type of information available, then we could see if that index indicates whether the population is stable or growing or if it's decreasing. If the population is stable or growing, then we would kind of have the sign of stock status not being the issue that needs to motivate allocations, and other factors would potentially take a higher priority in that.

If the index is decreasing, then that would give kind of that sign that something could potentially be addressed, and then you would have the advice of prioritizing reallocation towards a sector, if that would lead to a potential increase in biomass or a decrease in dead discards, and then, finally, kind of the no answer -- Pulling back a little, the no answer there, if there's no index of abundance, then we really don't have information, from a stock status perspective, neither from an assessment nor an index of abundance, and we just don't have the information to support allocations from that standpoint, and so any allocations would need to be based off of other factors.

So the analyses that would support this decision tree would be the stock assessments that we would have, SEDAR stock assessments, and, additionally to that, if there is no stock assessment for a species, kind of that index of abundance factor, that would be something that would come from a NMFS survey or a state survey, something of that sort, and that index would need to be evaluated in some capacity, to make sure it's having some representative trend, but, in the case of the South Atlantic region, that would probably be a rare instance, because, more often than not, if there's a decent index, then there probably is a stock assessment along with that, but I think that's all the information that I had for stock status, and so we can go then to the next slide, and John will take over for economic.

MR. HADLEY: All right. Yes, absolutely, and, before we go there, I just wanted to see if there's any clarifying questions on the kind of biological-related decision tree, the branch questions, if you will. I will note that we are going to -- As far as the discussion questions, we're going to really focus on the social and economic components for the SEP, and we are going to be bringing this up to the SSC, at their upcoming meeting, and reviewing the decision tree tool and blueprint that we've laid out, and we have some bio-related specific discussion questions for the SSC as well, and so that's the kind of future review of this decision tool, but I will take a pause there to see if there any questions, and, if not, we'll jump into the economic component.

DR. CROSSON: Every time my internet gets a little twitchy, the webinar keeps muting me, and so I just wanted to point out to the SEP that the previous -- That last slide that Mike just went over about reallocating based off of rebuilding plans is not a small thing, and there is all kinds of repercussions that I can think of that's going to drift into the economic.

If you look at the different discard rates and bycatch mortality from one sector versus the other and reallocate based off that, there's quite a bit of analysis that might need to go into that, from

the economic side, and presumably the social side, and so it's just something for the committee to think on.

MR. HADLEY: All right. Thanks, Scott. That's a good point. Absolutely. If there are no questions for Mike, we'll jump into the economic component of the decision tree. I am not seeing anyone unmute themselves, and so we'll go ahead and move forward.

The next series of questions will focus on economic-related aspects, and there's a series of questions that we'll go through, and then, at the end of the economic questions, there's a series of discussion questions for the SEP, and so we'll get into those afterwards, but, to jump into it, the initial economic-related question in the decision tree process looks at trends in demand, and so are there notable trends in demand for the species, looking at the potential branches of this? If yes, then we want to look at available data to try to examine what that trend may be in demand. If demand appears to be increasing for both sectors, potentially the outcome of that would be consider maintaining current allocations or basing your allocation decisions on other factors in the decision tree.

If demand appears to be increasing for one sector and not the other, the outcome of that branch, if you will, would be to prioritize reallocation towards the sector that is exhibiting increasing demand for a species, kind of looking at future needs within the fishery, and so, if there does not appear to be a trend in demand for a species, then the outcome of that branch, the no -- If the answer is no to that question, the option would be consider maintaining current allocations or look towards other factors.

Looking at potential analysis and trends in demand, one of the reoccurring themes that will come up is the idea behind the decision tree approach is to look at readily-available data, data that can be on-hand, and so, in this case, we'll probably end up having to look at proxies for demand, and so, on the commercial side, potentially looking at trends in ex-vessel price and landings, commercial landings. On the recreational side, as a proxy for demand, or potential future demand for a species, look at directed effort and landings for a given species.

Moving on, the next economic question of the decision tree looks at potential economic importance of a species, and so is the species economically important to one sector or both sectors? If the answer is yes, then examine -- The follow-up question would be to examine is it becoming more economically important? If it's becoming more economically important to one sector relative to the other, potentially prioritize reallocation towards the sector for which the species has a higher economic importance, there again looking at the sort of upcoming -- Indicators of the upcoming and future needs of the fishery.

If it appears to be of economic importance to both sectors, then consider maintaining current allocations or, there again, looking to other factors. Similarly, if the answer is no, that the species does not appear to be economically important to either sector, then consider maintaining current allocations or basing changes to allocations on other factors.

An example of this is, there again, looking at readily-available data that we can have on-hand to move through the decision tree. On the commercial side, potentially looking at logbook information, and this information can be used to compare gross revenue from a species and compare it to total revenue for the participants in that fishery, and you can see an example there is

the Table 3.3.1.4, and that's the table that we include in all of our economic and environment sections of our FMP amendments, and you can compare, there again, the gross revenue of a specific species and how that relates to the total revenue for vessels involved in the fishery.

On the recreational side, potentially looking at a comparison of a metric of directed effort, compared to all South-Atlantic-Council-managed fisheries in the appropriate region, sort of as a proxy for recreational importance, and so a large portion of the directed effort is towards a species, and that species may come up in the top-ten, or top-twenty, species, most targeted that the South Atlantic Council manages.

I will note that -- I forgot to note, earlier, that there are some examples throughout the document, and some of them are in the presentation, but we were using the infamous shadow shark, which is a made-up species, to sort of highlight what these potential analyses could look like, and so that was our generic example species that can be found throughout the briefing document.

Moving on in the series of economic questions, examining the potential change in net benefits, and so are there clear indicators that changing allocations will likely yield an increase in net economic benefits? That's certainly a question that I believe the council has been asking, and it's certainly an important question, but one that would absolutely be important in a decision tree approach.

If the answer to that question is yes, potentially prioritize reallocation towards the sector that will likely result in an increase in net economic benefits from additional ACL, or additional allocation, if you will. If no, consider maintaining current allocations or base the -- Suggest that the council base their allocation decisions on other factors. Some potential data analysis is, there again, looking at readily-available information that we have on-hand, look at the historical use of a sector ACL and whether those ACLs are being used or not, as well as projected use of a new ACL under a status quo allocation. That's one that we've run into, and that's going to be particularly important moving forward with the change in the Marine Recreational Information Program, or recreational data, that I alluded to earlier, and projections going forward can be quite different than historical use of a sector ACL.

Then looking at potential pareto improvement, and so is it possible to make one sector better off without economically harming the other sector? If yes, potentially prioritize reallocation towards that sector that would benefit from additional quota, or allocation, if you will. If no, consider maintaining current allocations or look elsewhere in the decision tree. Potential analysis in this respect, similarly, could be historic use of sector ACL or projected use of the new ACL under a status quo allocation. There again, thinking if one sector is utilizing its allocation and the other sector is greatly underutilizing, if you will, or underharvesting its ACL, and is there a potential reallocation there that could benefit one sector without notably harming the other.

Those are the economic-related questions, and I'm happy to go back, but, in general, some of the discussion questions that we had for the economic component of the decision tree I have up in front of you, and I will turn it over to the SEP for discussion.

DR. CROSSON: Did everybody get all of that? It's not a small thing. Are there more questions that you might have for John about this section that he just presented on economics?

DR. DUMAS: I've got a question. My understanding, before you presented it, is the decision tree would be applied sort of on a species-by-species basis, and is that right?

MR. HADLEY: That's correct, and I will note that we'll get into the example. We wanted to go through the questions first with the SEP, before getting into an example kind of final document, if you will, but the idea is, once we can calibrate these questions, with input from the SSC and other groups, to come up with an application where the council could work through this online, and I have an example of that to show that Mike Schmidtke put together, once we've run through all the questions, and I can hopefully make that a little bit more tangible.

DR. DUMAS: Thanks. Okay. Given that, there might be situations where you might want to reallocate across species, and that could result in a pareto improvement, and so you might have two different species, one species that's important to one sector and the other species that's important to the other sector, and so you increase the allocation of the first species for one sector, but increase the allocation of the second species to the other sector, so they both are made better off, and so we might also want to look at potential compensating effects across species, and that might be important.

The rec sector might be willing to give up some of one species if it got more of another, and the commercial sector might have the opposite preferences regarding those two species, because they're found -- The two species might be found in different depths, and the recreational sector is mostly in one depth, and the commercial is in the other depth, or they might -- The two species might be subject to different fishing gear with different selectivity, and so we might want to look at cross-species sort of compensation.

That would also be true for the biological questions also, to meet the biological constraints, but reallocating across species, or across sectors, might help meet biological constraints at lower costs, and so I just throw that out there, and I understand why you want to do it species-by-species, and the stock assessments are set up species-by-species, and fisheries are managed species-by-species, but there might -- You might be able to get more compensation and more equitable results if you look at potential trading off across species. Thanks.

MR. HADLEY: Chris, I appreciate that, and that's a very good point. Just in thinking about developing these questions, and developing the decision tree approach, we have been, I think, in a single-species mindset, but that's not necessarily how fisheries operate, and so that's a very good point. Thank you.

DR. DUMAS: I will give you some black sea bass if you give me some flounder, or something like that.

MR. HADLEY: Exactly. Point well taken. Thank you.

DR. ROPICKI: I had a quick question. The decision tree question related to change in net benefits, can you go into a little more detail on how you would use that data, or that data analysis, to answer that question?

MR. HADLEY: That's a good point. I think, when we look at -- It kind of comes into play when -- How much information we have available at the time, and a lot of these -- The change in net

benefits, often, we know for sure -- Or I won't say for sure, but we have a much more in-depth analysis to base that upon, that, I guess, data point upon, once an amendment has been developed and we've had the opportunity to essentially do our best to calculate the change, likely change, in net economic benefits towards the end of the amendment.

In this case, the council is going to be examining this early in the process and running through this decision tree likely early in the process, when they first start taking on an amendment for a species, and so what we may need to do, and this is probably related to the next question, looking at the pareto improvement, and are there clear indications I guess is a little bit nebulous, but getting into that situation where it's clear that one sector would be able to utilize additional ACL, while the other sector would likely not, and that sort of scenario -- You can have pretty good confidence in the notion that that would increase net economic benefits from that say stock of fish, or species, that's being examined, but that's kind of where we would be early in the process, that readily available data and early projections on knowing whether or not that additional allocation could be used by a sector.

DR. ROPICKI: It's funny, and one other thing I've noticed, and it's across kind of all three decision trees so far, is the idea that it seems like the decisions only come out easily if one sector isn't using all of its catch and the other one is, and we can move some. I think, in a lot of those cases, even going back to the historical landings kind of piece, the first decision tree, with accountability being one of the factors they want to analyze, I think you might want to be careful, on all of those, about how much -- I am trying to figure out how to say this. Are there differences in how accurately we're monitoring the catch between species, or is enforcement -- I'm sorry. Between sectors. Is enforcement better for one sector than the other, and is it in a way that's leading that sector to stay under its limit, while, at the same time, it's still of high value to them, and it's still a valuable species, but the other one is just a matter of we're having trouble enforcing it. I think some maybe discussion of accountability somewhere might be beneficial.

DR. DUMAS: Following up on my last comment about I will give you some black sea bass if you give me some flounder, another thing to look at is reallocating across time, and so the commercial guy says to the recreational guy that I will give you more black sea bass in the summer if you give me more black sea bass in the winter, right, and reallocating across time within a species.

Then a third would be reallocating across space, across geographically, and so suppose there's a species that there's a common ACL across states, I don't know, like North Carolina and South Carolina, and so South Carolina says to North Carolina that I will give you more black sea bass quota if you give me more flounder quota, allocation, across those two different species across states, and so there might be ways to -- Those are three ways in which reallocations across two different -- Looking at reallocations across two different species might yield pareto improvements, across species, just a given place in time for the same species at two different times, the same species across space, or two different species across space, and so reallocating across species, time, and space might also help.

The reason why the different sectors might want to trade in this way is because they might have different costs of accessing different species at different places or times, or they might get different values, and so the commercial fisherman gets a different profit per fish, and that profit per fish varies by species, but, for a given species, it varies by time and by location, and, for a recreational

fisherman, the consumer surplus he gets from landing a fish varies, of course, by species, but, also, it might vary by season and by location, also.

The two sectors differ in the profit and the consumer surplus they get from different types of species and from a given species at different locations and in different seasons, and so that opens up possibilities for pareto improving trading, because the net benefits they're getting differ in those three dimensions of species, season, and location. Thanks.

DR. STEMLE: Chris, just a quick question. When talking about doing reallocation across space, like you're saying, with like Florida and North Carolina and South Carolina, that would require that whatever species of interest we're looking at, that they're treated as a unit stock across all the states, in the sense that they don't have sub-populations within each state that would affect their overall biomass availability, something like that.

DR. DUMAS: Right. They wouldn't have sub-ACLs, and so it wouldn't necessarily apply to all species.

DR. STEMLE: Right. Okay. So I'm not a biologist, and I was just wondering, and goes anyone have like a rough estimate of are there more species that are managed as a single unit stock across the South Atlantic, or do we have a lot of instances with sub-populations?

MR. HADLEY: I will field that. Overall, it's largely just kind of managed as a unit stock. There are some exceptions. I mean, there are some species that are split between the South Atlantic and Gulf of Mexico, particularly the south Florida species, if you will, the snapper grouper complex as well as the coastal migratory pelagics fishery, looking at particularly king mackerel and Spanish mackerel. I know Christina can speak to that in very, very good detail, but those are -- Overall, it's -- The regional allocations are fairly limited, particularly within the South Atlantic, but that doesn't mean that it couldn't be an idea that's explored moving forward.

DR. DUMAS: Mid-Atlantic versus South Atlantic.

MS. WIEGAND: Just to -- Sort of to Adam's point and to make a note, the king mackerel and Spanish mackerel are considered one stock throughout the South Atlantic/Mid-Atlantic region, and then it's a separate stock in the Gulf region, but the regional allocations we have in place for the mackerels aren't based on them being different stocks, and it's more for ease of management, specifically, and so I guess, to be clear, we're sort of talking about two different things here, and the regional allocations for the mackerel species are management-based and not based on them being two different stocks in the Mid-Atlantic and South Atlantic region.

DR. CROSSON: I'm trying to think, and I'm racking my brain trying to recall, but aren't there some management measures in the South Atlantic that deal with the fact that the weather offshore in the Carolinas for the winter and spring is more severe, and so it's more difficult to catch some species, either commercially or recreationally, and so there's some management measures in the South Atlantic that are designed to make sure that Florida doesn't capture the whole ACL before the fish -- Before the weather has a chance to get better and improve in the northern range of the South Atlantic Council's jurisdiction.

MS. BROUWER: Yes, and we have commercial split seasons to alleviate that sort of problem, so that one part of the geographic area isn't going to be catching its ACL before the guys elsewhere have a chance to try to catch it, but that's how it's handled, through commercial split seasons, and, as far as recreational right now, I can't think of any kind of a management measure that is directly related to that seasonality.

DR. SCHMIDTKE: Myra brought up the commercial split seasons, and that's what I was going to talk about as well. It's not always used -- I know like greater amberjack is on my mind, because I'm working on it right now, and it's not always used in the context that you brought up, Scott. It could be applied in that context, but I know, for the case of like greater amberjack, the North Carolina fishery happens in the fall, when there would potentially be like weather becoming more severe, but that's when the fish are there, and so the split season is in place to make sure that Florida can catch when the fish are there, and North Carolina still has a chance, later in the year, to catch when the fish are there, and so that's another application of it, outside of the weather one.

DR. DUMAS: I just wanted to say that my comments are not arguing against the decision tree that you're showing, and my comments are just that, hey, yes, go ahead and do the decision tree for each species, but then compare the decision trees across species, and, in some cases, you might get some additional insights or get some additional value out of doing that.

DR. MURRAY: I have a quick comment on the decision tree, looking at economic importance. It strikes me that there might be some difficulty, particularly in the rec sector, in that sort of measurement, and it seems possible that there would be certain species that are really important that drive trip decisions that wouldn't necessarily show up in the data, and that is, as a recreational fisher, it might make your year to catch one fish, and so they're not going to show up as directed trips, or a way to harvest that much, but still be really important economically to those users.

MR. HADLEY: I appreciate that comment, and I see what you're getting at. Basically, it sounded like there's some information that's just maybe lost, or not examined, and I think we are limited, somewhat, from the recreational perspective, as far as using a proxy by looking at directed effort, and potentially trends in that, as far as a proxy for recreational importance.

DR. MURRAY: Yes, and I apologize. I didn't have a solution, but I was just pointing out a problem.

MR. HADLEY: That's a good point, and there are some kind of driver species that stimulate recreational effort, as you were alluding to, kind of the core species, if you would.

MR. DIETZ: John, could you go back to Question 4 on that list, on the discussion questions? Something I've been trying to figure out how to say, and I still don't think I'm fully there, is I think I've seen at least instances where economic importance, as far as an allocation decision, can often by much more quantitative or directional than a lot of the other consideration factors, and so I think an issue I've seen in the past is you end up getting one side using economic considerations as sort of the only tool in their toolbox, and the way that they want to point fingers and try and get decisions to be made, and the other group is saying that economics is not the only decision factor in this process.

I think the economic importance of a fishery, to one stakeholder group versus another, can often be a very -- People get very hyper-focused on it, and people will either treat it as the end-all-be-all or not worth the time, because it doesn't prove my argument, and so I think situating the importance of the economic value of an allocation decision, within the broader context, is very difficult, but very important, here, because, due to issues of data richness and importance beyond economics to certain groups, whether it's cultural or whatever it be, they all have just as much value, and these aren't always just meant to be pure economic optimization problems, and so it's deciding, on a species-by-species basis, probably, how strong are the branches of our tree that relate to economics.

I think that's something that needs to be kind of considered at the onset of these processes as well, because you can really get into a rabbit hole, where the answer will be clearly give it to all the rec guys, and look how much more money they will bring in if you just give them all the fish, and that's just not the answer every time, and, again, I don't have a perfect way of explaining this, but just kind of your first-order question here is how equally do we weigh the value of this part of a decision tree.

MR. HADLEY: I will certainly let others chime in on that, but that's something that I would love to hear discussion on it now, or come back to it later, because one of the -- It's a very good point, and it's something that we discussed in the development of the decision tree, is whether or not to apply weighting to one branch, so to speak, more so than the other, or should they all be treated equally, and so that's kind of a higher-level, I think, question that we'll certainly come back to around to, if it's not further discussed right now, but that was the exact thought that kind of ran through our minds as we were developing this approach and whether or not to apply any sort of weighting to these questions, or just kind of have an equal approach to each general topic.

DR. CROSSON: John, for Question 3 about data sources, and readily-available analysis, the slide you talked about was economic net benefits, and I think you alluded to using what they currently use in the proposed FMP amendments, and so -- Well, wait. The net economic benefits, are we including the producer surplus, consumer surplus, numbers that we're currently using in those amendment analyses?

MR. HADLEY: We will be, but that's just -- I think it's fact of the process and where it occurs. Another option is that the council -- As they have additional information, they could come back to some of these questions, as it's available. I think the intent, for now, and this is certainly something that we can clarify with the council, is to run through this towards the beginning of the amendment process, and, in that case, we do have the marginal consumer surplus and producer surplus estimates, but we haven't had a chance to really dig into it and provide an analysis based on the different decision points of the council, and so that's something that we could -- That's information that we tend to have on the backend of the amendment process, if you will, but, to that point, the council will have more information on it and could come back around to it, towards the end of the amendment, or an amendment, I should say.

DR. DUMAS: Regarding the weighting, the weighting of the different tree elements, there's a whole theory of that, multi-objective decision-making, and sort of a classic source on that is the book by Keeney and Raiffa, Keeney and Raiffa's book *Decisions of Multiple Objectives, Preferences, and Value Tradeoffs*, and it talks about -- It goes through the theory of how you decide on weights, and, when you've got a group of decision-makers, like the council, how do you go

through an exercise with them to determine their weights, if they're the ones who would be sort of weighting the different factors that go into creating something like this, a multi-attribute sort of decision function.

It also includes how to handle risk and uncertainty in the different factors and also how to handle risk aversion of the decision-makers of the council and how to put all of that together, the issues that are involved with coming up with the weights on the various attributes, basically in the council's utility function, and sort of how to go through that, and, also, it's applied examples of actually taking groups of decision-makers through that process of developing the weights, and so you may already be aware of that, but, if not, I would be glad to send the cite for that.

MR. HADLEY: I'm certainly taking notes on that, but, if you wouldn't mind sending the link to it, it would be appreciated, and we would certainly follow-up on that.

DR. DUMAS: Yes.

DR. CROSSON: All right. Let's take a lunch break now, and at 1:00 -- I'm thinking, and, again, if folks have a different idea, please let me know, but, when we get back from lunch, we'll try and make sure that we have these questions answered, and then we have the next section to go through, and then the overall stuff, and some of these things are going to drag across different parts of the decision tree, and so I think, when we get to the second and third one, we'll probably be able to answer some of them more quickly than we can these, but let's take a break until 1:00.

MR. HADLEY: All right. Sounds good. We'll talk to everyone again at 1:00. Thank you.

(Whereupon, a recess was taken.)

DR. CROSSON: We're going to get this discussion back on the road here. Before we start, I do have a request from Dr. Mike Travis from the Regional Office for a point of clarification, and I'm not sure of the committee or of council staff, but if Mike is able to be unmuted.

MR. HADLEY: Yes, we can do that.

DR. TRAVIS: I wanted to follow-up, and I don't recall who made the comment, about the concern of economic factors being the only consideration with respect to allocation decisions. My opinion is that, if the council addresses all of the National Standards and their guidelines in their allocation decisions, that should preclude economics being the only concern, because the National Standards deal with other factors than just economics. I think it's pretty clear that you have to incorporate social factors and ecological factors and other concerns, as appropriate.

Now, that said, admittedly, if you looked at the National Standards and their guidelines, the vast majority of them do speak to economic considerations, and so I think it's always going to be the case that economic factors are going to serve a primary role in these types of decisions, but, again, I don't think it will ever be the only factor in the consideration, and I can't see that approach being consistent with Magnuson.

Then number two is I wanted to follow-up on Chris Dumas' comments about this trading concept, because, at present, the council makes these decisions, and so they determine, based on what

factors they consider, they determine what the sector allocations are, but, Chris, it sounded to me like you had one or more other mechanisms in mind for determining allocations than simply the council setting them for some period of time, until which the council decides to change them, and so I was hoping that you could elaborate on that.

DR. DUMAS: Just from the council's perspective, if you, could, for one species, say allocate more of that species allocation to recreational, but, for another species, allocate more of that species to commercial, and both the recreational and the commercial both preferred both of those reallocations, and then that would seem to me that it might be something the council might want to do. You make both sectors better off by those two reallocations, and so that's the main thing I was referring to when looking at reallocations across species, and so I'm talking about reallocating a species in one direction in favor of the recreational, but then reallocating another species in the other direction in favor of commercial. If you pick your two species right, it might be that both the recreational and the commercial like that combination of reallocations, and they might both be made better off.

DR. TRAVIS: I agree with you on that, but I'm just thinking, functionally, how would that happen within the current management structure? Would you do it -- Would you limit those types of changes to within an FMP, or could they potentially cross FMPs?

DR. DUMAS: Potentially cross FMPs, and so, for example, you might go through this decision tree analysis, as it's presented here, and the decision tree might tell you, for one species, that you should allocate in the direction towards recreational, and that will make things better, in a lot of ways, but then, for another species, you might go through this decision tree, and, for that species, it tells you to reallocate towards commercial, and that would make things better, in a lot of ways.

If you did either one of those reallocations alone, then you would have one of the two sectors mad at you, possibly, but, if you did both those reallocations in combination, then a sector is willing for one reallocation, but losing from the other, and maybe you work that so those two effects sort of cancel out for both sectors, or at least any negative effect from reallocation of one species would be ameliorated significantly by the reallocation of the other species, and so I'm just saying look for those opportunities, and those opportunities might be out there.

If the decision tree tells you that you should reallocate highly in favor of one sector for this particular species, don't necessarily throw out that outcome as politically infeasible, because there could be another species that it might work to reallocate the other way, in the favor of the other sector, and the two reallocations combined -- Both sectors might be satisfied, and, in fact, both sectors might come out ahead, compared to the original situation of sort of status quo allocations in both species. That may or may not work, and it would depend on the species, and it would depend on the region you're talking about, but it might well work if the two different sectors, recreational and commercial, get very different levels of profitability, or consumer surplus, from different species.

DR. TRAVIS: Right, and that makes sense to me. I guess, in thinking about -- I can't remember who brought this up, but about the fact that stock assessments are currently the trigger for the council, in terms of reviewing allocations, and, as everyone knows, those assessments are periodic, at best, and I guess the point, to your example, is how would we work around that?

Say you identify a couple of species that might be candidates for this scenario that you laid out, but what if the assessments for those species are years apart, or we don't even have an assessment for one of those species? Do you see those as constraining factors on the scenario you laid out?

DR. DUMAS: Administratively, is the council constrained to making reallocations only at the time when a stock assessment occurs, or can they make reallocations at any time?

MR. HADLEY: To kind of address the points being made, I think that -- The council is free to address allocations as they see fit. They do have a set of triggers and a policy for that, as Mike pointed out, one of them being stock assessments, but I'm just trying to think, and I like the approach of having a multispecies -- Potentially running through this on a single-species basis, but looking at it from a multispecies lens, kind of comparing results, and I'm just thinking about a potential avenue where we could try to implement that is when the council addresses the unaddressed snapper grouper species.

In theory, there potentially may be many species being examined for allocations in one fishery management plan amendment, where we could go through that exercise that you described and look at is there a tradeoff between -- Scamp is going to be assessed, but, right now, it's unassessed, and so I'll use that as an example, but scamp and a whitebone porgy, or something like that, and that's probably a bad example, but we're going to be looking -- The point being we're going to be looking at multiple species in one FMP amendment, and we are going to be looking at allocations for that, and so that's an exercise. It's hard to -- This being early in the process, and we're developing it, it's hard to come to an exact conclusion, but it's something that we can certainly explore, and I think that would be a good candidate FMP amendment to do that.

DR. DUMAS: Right, and it's not just economic tradeoffs, but the same idea could work with discards. Maybe you want to reallocate toward recreational for one species, because the commercial discards are really heavy for that species, but, for another species, you want to allocate away from recreational and towards commercial, because discards are really bad for recreational for that species.

Any one of the two -- If you just tried to do one of the allocations by itself, you would get pushback from one sector or the other, but, if you did both of them at the same time, then their effects partially offset, economically, but yet you get the biological gains of reduced discards for both species, and so it could work for the biological attributes, or the biological questions, as well as for the economic ones.

MR. DIETZ: I think your first comment was directed towards what I said before lunch, and so I will go ahead and answer that, and then, if not, you can follow-up, but I totally agree with you that management standards should incorporate sort of the suite of factors, and I think that's sort of my point, that there are cases in which vocal stakeholders, or even potentially advisory committee members, people who aren't deciding, but are involved in the process, getting hyper-focused on -- Maybe not even economics, but one of the specific decision tree factors that they see maybe proves their point.

I think what I was trying to say was, I guess, cautionary towards how we communicate this decision tree to the public, when it starts being used, in terms of how do we view economic data in context of the other factors and why, even though it may tell a very clear picture to you, these other factors

need to be incorporated that tell maybe a different story, or a more nuanced story, or something like that, and so I think it was less about when you actually get to the decision-making process and a little bit before that step, when the public starts seeing this decision tree, and maybe making their own interpretations from it, and just trying to communicate how all these different layers sort of come together at the end.

MR. HADLEY: All right. Coming back around to the discussion questions, if I may -- Scott, I don't know if you want to work through these. I know we've addressed some of them, but I know we do have some sort of social questions and overarching questions coming up as well.

DR. CROSSON: Okay, and so this my concern, and I don't mean to be cracking the whip too much, but I just want to make sure that we try to get through this, because some of you -- At this point, I remember Andrew and Chris, and I don't remember who else I put on this, but anybody else who wants to help too, and Jason, I think, but I think Jason is gone until 2:00, and so is Kurt, and so, looking at these questions, do you guys think that -- Well, Question Number 1, keeping in mind available data, does the SEP feel that the set of questions presented covering economic topics is adequate?

I don't know whether this question of trading off one species versus another, and intersector trading that way, would be underneath Number 1 or Number 2, but, either way, I think that we could definitely add that in there, but is there something else that I'm missing that you guys think needs to be covered before we move on to the social stuff?

DR. ROPICKI: I was just going to say that, I mean, given the time constraints and data availability, I tend to agree that I think this is as adequate as you can do to cover the economic topics, given those constraints.

DR. CROSSON: I would say that we would like all the questions for the economic, and so are there any additional economic-related questions or topics that should be covered? That's actually, I guess, the tradeoff between Species 1 and Species 2. Are there any questions that should be removed from the economic side? I didn't hear anybody argue to that.

Is the data analysis adequate? Is there any missing data sources that should be examined? I don't hear anything in that direction. Then, finally, are the resulting recommendations from the economic part of the decision trees appropriate? Will they guide without being too prescriptive? I definitely think the committee seems to agree with that, and then there's additional stuff that we've suggested that should be incorporated into our writeup for this section, but, if you all are ready, I would like to move on to the next section of the decision tree, the social stuff.

MR. HADLEY: All right. Sounds good, and I will hand it over to Christina. I'm going to continue controlling the slides, but we'll switch over to the social side of the decision tree.

MS. WIEGAND: Excellent. Thanks, John. For the social questions, I tried to take two different approaches, one that really focused on quantitative data and a second that focused on more qualitative data, as a way to make sure we're using those mixed methods and not missing a chunk of information that's maybe not captured through the available quantitative data we have.

Starting with this idea of fishery-dependence, this is where I am really leaning heavily on quantitative measures, particularly the social indicators. If you will think back to about an hour or two hours ago, when John was talking about the GAO report, one of the things they mentioned that the council should consider in allocation decisions were those social indicators, and so here's where we have really included them.

We start with this first question of, among communities with a high regional quotient, or the top ten communities that have the highest regional quotient, are most of them engaged in commercial fishing, recreational fishing, or both, and I'm sure that many of you are familiar with the social indicators, but I'm just going to sort of briefly describe them as I go through, just to make sure we're all on the same page, and, when I'm talking about a regional quotient, it essentially represents the proportional distribution of commercial landings, or recreational landings, and it's calculated by the total pounds of a species landed in a given community across the total pounds for that species across all communities, and so, essentially, it's the relative importance of a given species across communities in the region.

Then the question is are most of those communities highly engaged in commercial fishing, are most highly engaged in recreational fishing, or are they equally engaged in commercial and recreational fishing? Again, when I talk about engagement, I'm talking about that specific commercial fishing engagement indices, which uses the absolute number of permits and landings and value and things like that.

Moving on down, if most of the communities are engaged in commercial fishing, the question then becomes are commercial fishermen dependent on the resource for their livelihood, and this could be measured using the local quotient, which essentially measures the proportion of an individual vessel's total landings of one species in a fishing year compared to landings of all species in that year, averaged across communities, and so it illustrates, for the species, the large part of a vessel's catch, which can indicate that vessel is relatively more reliant on a given species.

Then, if the answer to that is yes, you might want to consider prioritizing commercial fishing opportunities. If not, you might want to review opportunities for associated species and consider whether adjustments to this particular species is really necessary.

Then, if most of the communities are highly engaged in recreational fishing, you could ask are the recreational fishermen dependent on this resource for trip satisfaction, and one way to get at that is to look at the number of directed trips combined from MRIP as well as the regional headboat survey, and, again, if they are dependent on the resource for trip satisfaction, you may want to consider prioritizing recreational fishing opportunities. Alternatively, if they're not, you may want to look at associated species and consider whether any adjustments to this species are really necessary. Then, if they're equally engaged in commercial and recreational fishing, there are sort of two options that you could consider of removing sector allocations altogether, or you could consider allocating equally between the two sectors.

Again, I sort of covered a lot of this potential analysis for fisheries dependence while I was going over it, but the key here is to use those social indicators, and so commercial and recreational fishing engagement as well as the regional and local quotients.

Then, next up, this tree looks at cultural importance and tries to take a much more qualitative approach to measuring, and so our overarching question is does the fishery plan an important role in the history of fishing communities in the region, and, if it doesn't, you may want to just consider allocating in a way that reflects the current state of the fishery, but would allow for any growth or adjustment.

If it does plan an important role in the history of fishing communities, does it still play an important role in community cultural traditions, and, if not, you might want to consider allocations that mirror the historical real allocations in some fisheries, or de facto allocations in others, depending on when allocations were put into place.

If it does still play an important role in the community cultural tradition, the question is then have changes in the regulatory environment affected the role this species plays in communities, and, if it has, then you may want to look at allocations and again consider a way to move them back towards that historical real or de facto allocation or base them on current values in the fishery. If it's not the regulatory environment that has affected the role a species plays, you may want to consider allocations that prioritize some of the other decision trees, such as biological needs.

Again, here, we're trying to use more qualitative data. Things like cultural importance and values can be challenging to get at, from a quantitative standpoint, and the two sources we're really looking to use here are fishery performance reports, which we'll talk about those a little bit later in the meeting, but it's a series of questions that we pose to all of our advisory panels, to get a sense of what's happening on the water, as well as using oral histories that can already be found readily in NOAA's Voices database.

With that, here are the questions, and a lot of these questions are similar to what was asked for the economic questions, with a few additional questions to really focus on this qualitative data and how we can sort of gather it and use it in a way that's going to be beneficial for the decision tree process, considering, like John talked about earlier, we're on a bit of time constraint, and so the lengthier types of analysis that we would typically do with more qualitative data may not work well for the time we're going to have to sort of get this information together for the council. In the interest of hurrying us along, I won't ramble, and here are the questions, and I'm happy to answer any questions that the SEP may have.

DR. CROSSON: Are there some questions over Christina's section of the presentation? I didn't mean to put the fear of God into everybody, but I'm just worried about the time, as always, because I know we have more presentations this afternoon, and we're not in -- I kind of balanced out that we would have at least another hour of discussing allocations, I think.

Getting into this, is there additional stuff that we would like in this? It crossed my virtual desk yesterday, a *Guide to Social Impact Analysis for Fisheries,* that was just proposed as a DMF tech memo, and I have not had time to open it yet, but, at some point, it might be worth looking at that and seeing what's in there.

DR. SWEENEY-TOOKES: Christina, it's beautiful, as always, and you do really nice work on the social angle of this. I did have one question for you. Well, probably a few questions. You know me. Back on I guess it's Slide 20 from our briefing packet, but you mentioned here that, for the fisheries dependence among communities with a high regional quotient, are most of them

engaged in commercial fishing or recreational fishing or both, and I just am curious. Under 1(a)(ii) -- Where is the one that says removing sector allocations altogether?

MS. WIEGAND: Number 3. For those communities with a high regional quotient that are highly engaged in commercial and recreational fishing, the thought would be remove the sector allocations or allocate equally between the sectors.

DR. SWEENEY-TOOKES: Thank you. I couldn't find it. I wrote myself a note, and then I couldn't find it on the slide. That seems like such a logical thing to say, but I find myself wondering what the potential fallout of that could be or what future impacts that might have, and I don't know. This is a legitimate question to the council, or the other members, and it seems like a logical thing to say, but I'm wondering if we're missing any potential problems with that idea.

MS. WIEGAND: Well, I certainly welcome any input, if there are members of the SEP that feel like there might be something missing there, given how logical it seems. I will say that we certainly know that fisheries don't exist in a vacuum and that, if we get into a situation, later on, where it seems that there is no longer -- If the commercial fishery is taking off in some areas, or the recreational fishery is, or vice versa, the council would need to reconsider allocations fairly regularly.

Luckily, like we were talking about earlier, under the economic section, we do have a trigger policy in place which triggers review of allocations at several points in time, one of them being a new stock assessment and others being public comment or information from fishery performance reports that indicates that allocations need to be changed. That's one thing that pops into my mind, but I don't know if anyone else has any thoughts.

DR. SWEENEY-TOOKES: That makes sense, and then I also -- I wonder then, on a related thought then, is there any -- Are there potential issues to removing the sector allocations, versus allocating equally, like you have here, or will it all be triggered the same way, and it doesn't really matter which happens?

MS. WIEGAND: I do think there's a difference between removing sector allocations altogether and allocating equally between the sectors. Just simple things such as timing of the fishery could make a difference, and so say the recreational fishery typically takes off a little bit earlier than the commercial fishery takes off, for example, and there's always potential for the recreational fishery to then harvest say 75 percent of the quota and the commercial sector then only having 25 percent left. I think there are both practical and perception issues to that as well, and I would imagine that fishermen perceive my sector, my fraternal brothers and I have, this 50 percent allocation, and we're guaranteed that moving forward, versus, if there are changes in the fishery, and there are no sector allocations, they're not necessarily sort of guaranteed that 50 percent on the books, so to speak. Does that make sense?

DR. SWEENEY-TOOKES: That does. Perceived implications of it versus actual lived implications, absolutely. Those could be huge. Thank you. One other question I had for you, back on Slide 23, when you were talking about where you would be pulling this from and looking at existing data, and you mentioned fisheries performance reports and the existing oral histories on the Voices archive. I'm assuming, and it just didn't get put here, that you're also looking at gray literature and reports and published literature, et cetera, et cetera, right?

MS. WEIGAND: Yes. Sort of any -- Particularly gray literature that would be out there. There is, unfortunately, not a huge swath of information on the cultural importance of fisheries in the South Atlantic, particularly if we're talking about both commercial and recreational fisheries.

DR. SWEENEY-TOOKES: We're writing as fast as we can, I promise.

MS. WIEGAND: I appreciate it. I don't mean to rely on you and Tracy completely for research, but a lot of the work you guys have done has been incredibly valuable for stuff like this, and I'm thinking of the oral history work you did in Georgia that's now on the Voices database, and I think we'll be relying heavily on that kind of work that's been done here in the South Atlantic.

DR. SWEENEY-TOOKES: That's very kind, Christina. Thank you.

UNIDENTIFIED: I have one quick question about Slide 20 in the presentation. Does a high regional -- Can you describe a high regional quotient, what that means? Does that mean a large percentage of economic activity in the community is driven by fishing?

MS. WIEGAND: For the regional quotient, you could base it on value. In this context, I was thinking of basing it on pounds landed, but it potentially represents the relative importance of a given species for a community, and so it's literally just the total pounds of a species landed in a given community by the total pounds for that species in all communities in the region, and so, when I say high regional quotient, we may decide the ten communities that pop out, based on those numbers, and then we would take those ten communities, say, and run engagement for them, to determine whether they are highly engaged in commercial, recreational, or both.

DR. CROSSON: Relative to other communities, right, because -- Especially as a portion of its local economies, I would guess?

MS. WIEGAND: Correct. Relative to other communities.

MR. DIETZ: Just, on this slide, I have kind of a question, again. I was just thinking about the question about things being overly prescriptive, and is it overly prescriptive to say that a high local quotient, or high number of directed trips, assumes that you can't transfer fisheries? I guess the logic path here is, if you have a high value for either of those, then they're dependent, but is that necessarily the case every time, that, just because you have a high local quotient, it means you're dependent on the fishery, and it probably means that you get better rents from a fishery or something, but that doesn't necessarily mean there aren't other fisheries in your area that you could easily go out and start doing efficient trips out of, and so I do wonder if that's a little -- Especially on the recreational side as well.

Just because I want to go out and direct my trip towards X species every time, it doesn't mean that, if I lost access, I couldn't go target something else around me, and I know there is satisfaction and utility measurements and that out there too, but it does seem overly prescriptive to say that, because I catch a lot of this, it means I'm dependent on it. That's probably true most of the time, but I just don't know if that's true all of the time.

MS. WIEGAND: Thank you for that point. I think that's a wise thing to look at, especially when considering the recreational sector, where it might be easier to sort of jump into a different fishery, should you no longer have access to the given focus species that we're talking about for a given allocation. I wonder how we would be able to get at that in sort of this decision tree format. We could, arguably, look at other species, if they have open or limited-access permits, but I agree that the extent to which an individual or a community is dependent does also play a role in whether or not they can switch to other species and continue their business.

MR. DIETZ: I think these are great measures, and they're what we should be using, but I don't think we can quantify dependence 100 percent of the time, and so just having a little bit of that boots-on-the-ground knowledge about different regions and things, about what species are available and what is the typical angler behavior and things like that. Just incorporating that extra layer of qualitative data in this would probably be helpful.

MS. WIEGAND: Absolutely, and I think some of the fishery performance report data would be able to get at that pretty well, and so thank you for that. There might be a way to revise this to sort of incorporate some of that information, and I appreciate that input.

DR. CROSSON: I'm trying to -- I feel like I'm a little dense. Can you go back to that slide again, please? Again, I'm getting back to Number 3. If both are equally engaged in commercial and recreational fishing, removing sector allocations, and why is it removing sector allocations and not just removing the social considerations from the decision tree?

MS. WIEGAND: That's an interesting point that I had not thought about. I guess, arguably, if they're equally engaged, in this case, we're interpreting that as equally dependent on both, and you may just not want to consider this decision tree at all. I do think, again, there could be some -- I am loathe to remove it entirely, because I think there are some perception issues that are important to consider, from a social standpoint, and the idea, particularly of allocating equally between the sectors, I think really gets at this fairness and equity idea that the council has talked a lot about that we didn't create a specific decision tree for, because we felt that it could be incorporated in the various decision trees, and that's where I see Number 3 sort of incorporating that idea, but I do think you're right that there could be an argument made that, well, if they're equally engaged, then they're not dependent on -- Neither sector is dependent upon the fishery, and so you could remove the fishery dependence.

DR. CROSSON: Let me just -- It's almost like a variable -- It's a variable popping up on both sides of an equation, and you just cancel it out and look at other variables and the influence of those, and that's all. I would think then that you would shift over more to the biological. Just because they're both equally and socially engaged, and equally dependent on fishing, it doesn't mean that they both have the equivalent economic value or that the biological factors that Mike brought up early on about bycatch mortality or other factors is important and isn't still there, and so it still might be something you need to look at on an allocation decision.

DR. SWEENEY-TOOKES: Maybe I misunderstand how these decision trees work, but, rather than removing it, if these are equal -- If you just remove it, then do we not go on to the next question, because there is two decision tree questions for the social.

DR. CROSSON: I'm sorry. You're right. I forgot about that as well, Jennifer.

DR. SWEENEY-TOOKES: I didn't know if I misunderstood the decision tree. So, I mean, you want to keep it in there, even if, like you're saying, the variable ends up cancelling each other out, and that's not the only related variable there. Christina raised a really good point earlier too that it's also the perceptions of the people that are being managed, and so you want it there, even if it ends up being a useless value that particular time.

DR. CROSSON: We're definitely still doing clarifying questions, but do we need to move over to the questions now and get into those, so that we can -- The discussion questions. Let's take a look at these. Are there any additional sociocultural related questions that need to be brought in? Is there anything here that people see that's obvious that is missing? If not, then the data analysis that are in here -- These are things that are already incorporated into the FEPs, right, Christina, these dependence measures?

MS. WIEGAND: Correct. All of these social indicators are incorporated into the FMPs in each amendment that we do.

DR. DUMAS: I've got a question. For these social indicators, is there an indicator that is some measure of the uniqueness of the particular community, the cultural uniqueness? Like, for example, suppose we had like ten different communities that were all heavily dependent on shrimp fishing. If we lost one of them, that would be bad, but we've still got nine other communities that are shrimp fishing communities.

On the other hand, suppose, in the whole region, we only had one community that had some unique historical cultural aspect. Then, if we lost that particular community, then we totally lose all of that historical cultural aspect of our region, and so is there some -- It may already be in some of the social data, some of the social variables that we've got data on, but one thing I would be interested in is there some measure of how unique, culturally or socially or historically, the different areas are, the different fishing locations? That's all. Thanks.

MS. WIEGAND: Thanks, Chris. I think you sort of nailed what I'm trying to achieve with the two different decision trees. To my knowledge -- The social indicators certainly don't measure this idea that you're talking about of uniqueness, and I would need to think a little bit more about what kind of variables we would want to include in a sort of dataset to get at this idea of uniqueness, but we certainly have qualitative information that talks about the uniqueness, or the cultural and historical importance of given communities related to fishing, which is what I sort of hope to capture in that second decision tree, but I think it's an interesting idea, to try to sort of look at the literature and determine what variables we would need to look at to determine uniqueness and where that data may exist in a way that we could pull.

DR. CROSSON: Right, because uniqueness is sort of different from dependence.

MS. WIEGAND: Yes, exactly.

DR. CROSSON: Given the need to complete any decision tree in a short amount of time, what is the best way to summarize and present the available qualitative data? Any ideas on this?

UNIDENTIFIED: I know it doesn't help much, but that seems case-by-case, to me. I don't have anything prescriptive there, as far as how do you feel about it.

MS. WIEGAND: It will probably likely matter on sort of the bulk of information that we can gather for a given species. I will say that what we've been doing, mostly, particularly for fishery performance reports, is just sort of your basic, run-of-the-mill summary that this is what the AP talked about, and the same could be done for oral histories. My concern was that I wasn't sure how well just a sort of bullet-point summary was going to resonate with the council, how beneficial that format would be, and so, if anyone on the SEP has any suggestions for anything else we could do, other than sort of the simple bullet point summary of what was discussed during an AP meeting, or during a particular oral history, I would welcome that input.

DR. SWEENEY-TOOKES: As someone who works with qualitative data, and I love qualitative data, but I know that people really respond to quantitative data as well, and we do so much interdisciplinary, multidisciplinary, work that we find that people respond to quantifying the qualitative, right, and so having some sort of evidence that this is not a single person or two, but, at the same time, finding those excerpts, finding those stories, or, like you're saying, finding those particular quotes that do resonate and making sure to include some of those voices.

The whole quantifying the commonality of this response, yes, but then, also, wherever you can, just one or two statements that allow people's own stories to come through, and that really seems to resonate with people, and it gives the why and the emotional resonance to the what that you're presenting with the quantification of it.

MR. DIETZ: First of all, I completely agree with both of those points by Jennifer. Secondly, the social stuff does seem fairly well suited for like mapping and doing some sort of creative overlays on some mapping, depending on what the fishery is and things like that, and so that might be an interesting way to display some of this to the council.

DR. SWEENEY-TOOKES: That's a really neat idea. In fact, we're sort of trying to do that right now. There is existing -- There's an existing coastal atlas in Georgia that does it from more of a biological viewpoint for the coastline, but we're trying to add those stories to it, and people do respond really well to those, and so that's a great idea. That was David, right, that said that?

MR. DIETZ: Yes.

MS. WIEGAND: Thank you both. I think putting together some sort of way to map this data would be a fantastic way to present some of this, and I always welcome an opportunity to mess around with GIS, and so thank you. I really like that suggestion, and I will look at the Georgia coastal atlas, to see what they've put together as well.

DR. SWEENEY-TOOKES: If you remind me, Christina, because I will probably forget, but there was some really neat fisheries mapping done by some applied anthropologists that I just stumbled on a few weeks ago, and I want to say that it was in Alaska, but it was story mapping addressing these same issues.

MS. WIEGAND: Fantastic. I will absolutely be reaching out to you about that.

DR. SWEENEY-TOOKES: Awesome.

DR. CROSSON: Should the vulnerability and social indicators be incorporated into the social decision trees? I don't remember hearing any objections to that.

MS. WIEGAND: They're not currently incorporated in any way in the decision trees, and, just in case there is anyone who is sort of not familiar with those indices, those are another one of the many social indicators that we use in the amendment, but they're essentially three different indices that look at poverty, population composition, personal disruption, and sort of variables that can be pulled from the U.S. Census that contribute to a community's vulnerability, and so high poverty rates, more single-female-headed households, households with children under five, and assorted other variables that have been identified by the literature as important components to an individual community's vulnerability. I haven't incorporated those in the decision trees in any way, but I didn't know sort of the extent to which the SEP thought that that might provide valuable information for setting allocations.

DR. CROSSON: I had vulnerability and dependence conflated in my mind. That would seem, to me, to be too much data and not as directly related to your allocation decisions, but maybe other people have different opinions. Are the resulting recommendations from the social decision trees appropriate? Are they clear enough to guide allocation decisions without being too prescriptive? Then should the questions listed in the decision trees be posed to the APs? Thoughts on those?

UNIDENTIFIED: I would say no, just for the reason that APs should -- The questions to them should probably be a little bit more specific, in trying to kind of fill in a little bit of those maybe regional or cultural gaps that these broader questions can't get at, and I think we've identified a few of the like -- The nuances of different regions or fisheries and things like that, and so I think the FPRs would probably be better suited to just try and get a little bit of the color in between the things that we're asking through the decision tree.

DR. CROSSON: I would concur with that. Christina, do we think that we've addressed these sufficiently that we can move to the overall section of the allocation tree decision?

MS. WIEGAND: Yes. Absolutely. I appreciate everyone's input on those social questions. All right. I think I am going to continue the last few slides before we move into the overall questions. One of the things we did want to briefly cover was sort of topics that we had initially considered putting into a decision tree format, but ultimately decided to remove, and one of those were things like bycatch rates, discard rates, mortalities, and the reason we decided to remove that is because we felt like they were ultimately difficult to address through allocation changes. There are certainly different selectivities between sectors, but, ultimately, we felt that those issues would probably be better addressed through other fishery management measures, as opposed to allocations.

Then the second issue that we ultimately decided not to include as a decision tree was looking at effort by gear, location, and changing distribution of stocks, due to climate change or other factors, and those topics didn't really fit into a sort of step-wise decision tree approach, and the council also doesn't use a lot of regional allocations, the exception, of course, being king and Spanish mackerel that we talked about earlier, and so that's, ultimately, why we decided to not really

include those formally as decision trees, but that doesn't mean the council can't talk about these in terms of allocations, but they didn't really lend themselves well to the decision tree approach.

Here's how we sort of broadly foresee working with decision tree results. One of the things that we have to consider is that the different trees are not going to have the same input for each species, and so, for example, the social tree may give a different type of result than the stock status tree or the economic tree, et cetera, and so they're going to likely point to different sector allocation recommendations, and one of the things we're concerned about is sort of how to address that situation.

We could consider a single rank order to the four decision trees and weight the outcome of each major topic ahead of time, or we could go with what the majority of the decision tree recommend, or we could just assign no order to them and ultimately let the council use their informed judgment, based on the information that they are presented, and so we're going to get to questions about that, but those are some of the things we're broadly considering when it comes to working with decision tree results. John, I didn't know if you wanted to go over -- Perfect. I will let Mike Schmidtke talk you through what he's put together in R, which I think is going to be incredibly beneficial, when it comes to presenting this information to the council.

DR. SCHMIDTKE: Thanks, Christina. As you can see on the screen, there is a very bare allocation tool. This is kind of the skeleton of it, really, with only a little bit of meat, and we wanted to get some feedback on kind of the concept that it's portraying before we full on move forward with it, but what we would hope that this would do is go through each of these decision trees, in kind of a click-wise fashion, and you see here that the question is presented, and, depending on the result that's selected -- As you move on through, you see going through that tree, and you end up with whatever that final line of advice is, with that advice varying based on your responses.

John just went through for the landings, and now he's clicking through for stock status as well, kind of going through those responses there, and the thing that we're kind of hoping to have as the final deliverable coming out of this is the summary tab, and so, as you click through each of the decision trees, whatever the advice is that you land on in that final section would be stored in that summary tab. We would have a section for each of the ones, the landings, stock status, economics, sociological, and so that would be kind of like the end guiding qualitative advice that would be given to -- Assuming this is going through some type of amendment process, this would go towards an IPT, and they would then take council direction regarding this advice and develop some allocation options to be considered.

That's kind of what we're hoping to do, and this would be -- This could potentially be something that even goes -- It goes through committees, or goes through at the council level in some fashion there, where these options are selected and it can be done in hopefully a pretty quick and smooth way, and so I think that's all I had, and I can take questions on kind of how we're doing this, or we can take questions on how it could potentially play out and be used.

MR. HADLEY: All right. I'm not seeing any microphones go unmuted, and so I will keep moving along here.

DR. SCHMIDTKE: John, sorry to interrupt, but I had written down a note, and I forgot to bring it up. With what Chris suggested before, of kind of that inter -- That cross-species allocation type of process, one potential application of this in that type of mindset is that -- I mean, we can do more with these results. If they're directional in a way, we can store like the landings are pointing to the recreational, the stock status is pointing to commercial, or something like that, and we could have some type of comparative spreadsheet, something like that, where you match up species, where those type of connections could be made, those complementary connections could be made, and that's something that I was thinking, as Chris made his comments, that this could be used for, to kind of like start that initial process, if that's the direction that we wanted to move with this. That's all I had, John.

MR. HADLEY: I appreciate that, and I will note -- I just saw a note from Chris that he had to step away to teach a class, but that's something that we can certainly follow-up with him on, and he will be sending notes on this discussion, and so I just wanted to relay that to the group.

Switching back over and kind of finishing up the conversation, as a timeline for the general approach, we have worked through developing the outline and draft questions. The next step is to run it through the series of reviews, starting with the SEP and followed-up by the SSC. Afterwards, after we've taken into account any comments received, we'll work towards sending it to the Southeast Regional Office and the Southeast Fisheries Science Center, to gather input there.

The idea is we've been giving updates to the council throughout the development of the process, and we'll also run it by our AP members, but the intent is to really bring it before the council after we've been able to incorporate the different review panels' advice and guidance and bring it before the council for a sort of draft review at their September 2021 meeting and moving towards, ideally, final approval from the council on this, on a very polished, final product, if you will, at the December 2021 meeting. To kind of wrap it up, and we got into these discussions a little bit --

DR. CROSSON: John, can you go back one slide? What happens then? Final allocation decision tree blueprint, and so it's given to the -- It's approved by the council in December, and then is it incorporated into some other kind of documentation, or is it reviewed again, or does it become part of an FMP? What's the process?

MR. HADLEY: That's a good question. I think the idea, for now, is that it would be a sort of polished tool that the council could apply on an FMP-by-FMP basis. It's not going to be necessarily adopted in the same manner as the ABC Control Rule or anything along those lines, and I think it's more of a -- As I mentioned, it's designed to be a decision tool and not necessarily getting into the -- Not wanting to be an overly prescriptive aspect of it, and it's something to help guide the council in allocation decisions, and so I think it will be --

The idea is that it will be used, over and over again, as these allocations decisions continue to pop up in the council's work schedule, and so it will be a product, kind of what Mike alluded to, that we could work through with the council, either on the committee level or work through in an IPT and take that guidance forward to the council, to gather their input.

In general, this is something -- This is an ideal timeline, and it's not necessarily something that's set in stone. If we do run into issues, we may be asking the SEP for -- There may be a request for guidance in calibrating the results. You know, we worked through it, with three or four different

species, and we're running into this problem, and can you help us? Can you provide some guidance on helping us work through it, and so we may have to come back to the SEP next year, if we do run into issues, but the idea is that it's going to be used over and over again in allocation decisions, as a tool. I guess there should be one more bullet there for kind of tool use, and the deadline would be kind of ongoing.

We've discussed this a little bit, but some of the general discussion questions that we had -- As I mentioned towards the beginning, there are certain topics that are touched on many times from a different perspective, and particularly landings is one that comes up from many standpoints. The way we've developed this tool is sort of a siloed approach, where we look at it from a social perspective, we look at it from an economic perspective, we look at it from a landings perspective, and so forth.

Initially, we thought that that would be a good way to work through this, but I just wanted to pose the question, and would it better to have more of a less siloed approach or a blended approach, or should we kind of stick with the way we're going, looking at -- We're going to look at the social perspective, and then we're going to jump over to the economic, and so on.

Otherwise, looking at just general comments on would it be useful to -- Do you feel that it would be useful for the council to kind of meet their objective of looking at allocations in a systematic way and objectively examining at least initial allocation decisions and kind of helping point which direction they may want to go? Last, but not least, is looking at the outcomes from working from the decision tree will vary by topic, and we discussed this. Should there be -- Should we look into weighting?

I know that Chris sent out an email to the group with many good resources on, if we do want to go into the weighting, how to go about doing so, but, as Christina mentioned, looking over do you want to have a majority rules situation, or do you want to have a weighting ahead of time, where maybe the social is more important than the economic, which is more important than the landings, that sort of thing, and so just input on that, whether or not we do want to have weighting, and, if so, how to go about doing that. With that, I will turn it over for the finishing -- To wrap-up the discussion.

DR. CROSSON: All right. Well, let's just tackle these one at a time. The weighting one is the big one, I guess. Does anybody disagree with the siloed approach that's been laid out here? I can't imagine -- I would guess that, anything that you would do that wouldn't be siloed, would it be dependent on individual species, or would you have to come up with a -- I don't even know what that would look like if it wasn't.

MR. HADLEY: I think a non-siloed approach would be to kind of go back to the drawing board, so to speak, in general. We would have to think about what that would look like.

DR. CROSSON: So I guess the first and second question are highly related then, and so do you all feel that this is a useful and systematic way for the council to examine allocation decisions?

DR. ROPICKI: I was just going to say that I don't see a problem with the siloed approach, and I do think it's a good start. I think it's something that, as an approach, should probably be revisited every few years, to see if there are new things, new data sources, things like that, and it should be

kind of a living process, but, I mean, the first two, yes, I'm good with a siloed approach, and I think it is a good way to examine allocations.

DR. CROSSON: I don't disagree with that. Well put, Andrew. This last question about weighting, what do folks feel about weighting different topics, and, if so, which ones do you think should be prioritized?

UNIDENTIFIED: I do think it's important to kind of establish which factors you think are most important or which data streams, in this current fishery, are the most -- That we're the most confident in or are the most robust, you have the best time series, et cetera, et cetera. The thing I'm caught up on is the physical act of applying like a numeric weight to each of these categories, because then you're just adding another layer of quantification to the problem and then, if it is a tricky --

If it is not just a cut-and-dried answer, where these different branches of the tree have different outcomes, and then, by weighting it, you're sort of boxing yourself into whatever answer the tree spits out, in a way, because that's -- You've almost quantified it, in a way, but, if you don't attach physical percentages to each part, I think you're going to have less issues down the road, when you actually have to start making decisions, and I just think it's risky to start actually trying to like quantifiably rank things time and time again.

It's a challenge, I agree, because you do need to acknowledge that sometimes these factors do outweigh each other, but I just -- When you start putting numbers on things, then people can do the math, and they can get an answer, but you could get down a path that you don't necessarily want to be down.

DR. CROSSON: More thoughts? Because, if it's not weighted, then everything is equally ranked, right? Everything is equally weighted?

UNIDENTIFIED: Yes, and I guess that's kind of -- Ideally, there's a qualitative nature to this too, but that's kind of the tricky part of this as well, and I don't have a great answer, I guess.

DR. SWEENEY-TOOKES: I kind of think that uncertainty though at the end, where there is no easy number decision, that's where the council has to decide what is a value to that particular group of people, and I think it's important that that qualitative component is there.

UNIDENTIFIED: I think, regardless, I do agree that the onset of any new analysis, or new allocation decision, for any fishery or species -- The first order thing you would do is assess these four topic areas and what you think the importance of them, or the quality of the data, in each of these are, and so I do think the first thing you do is assess the quality of each of these four silos and then move forward, understanding that level, or the qualitative weighting of them, at the very least, is something you should be doing at the beginning of each time you initiate this process.

DR. CROSSON: Maybe one thing that I would volunteer then is that the council should decide on which of these it wants to prioritize before you go through and do the analysis, and so then you're not going backwards and making a decision retroactively, if that makes sense.

DR. SWEENEY-TOOKES: Scott, isn't the point sort of that they're not supposed to make that decision at the onset, and that the whole point of the decision tree is to make step-by-step decisions based on small pieces of data to come out the other end and realize what that data shows us, before they make the decision, when they make the decision?

DR. CROSSON: What I am worried about is that they would -- Maybe I am not thinking this through clearly.

DR. SWEENEY-TOOKES: I mean, if they start off by saying, well, yes, we have all of these different areas, and we're going to look at all of these things, but, really, what we care most about is the landings, and won't we end up with an answer where they will prioritize landings? Whereas, if they have to start off without weighting one of the topics, then, at the end, they come out with answers that say, well, this would be great socially and economically, and it would be terrible for landings and great for stock status, and then they at least have to make a conscious decision about what to prioritize at that moment with that data.

DR. CROSSON: Yes, I think you're right. Out of these social and economic and landings and stock status, I see several of them are also going to be highly correlated with one another, assuming that it's a fully-managed fishery, and the economic output and the landings are going to be highly correlated, and stock status is going to be related to that as well, at least over the long term. The social, I have a harder time kind of thinking through, but -- It would be great if they're all equally weighted, and some of them are usually going to be pointing in the same direction, and so perhaps it's not as much of a concern.

DR. STEMLE: Just a quick question. When we talk about the siloed approach, which way are we going with this? Are we going to social, economic, landings, stock status, or stock status, landings, economic, social?

MR. HADLEY: Adam, that's a good question. I guess a question that I will pose back is, is it important to have a specific order to it? I know that it's worded differently in that question than how we presented it, for agenda purposes, but that's a good question. I mean, is that important, how we present it? Do we want to go one first, followed by the other, followed by the other, and then wrap up with a certain topic, or does it matter?

DR. STEMLE: I thought that's what the siloed approach meant, meaning that one on top of the other, and one is on the bottom, and so, essentially, and this kind of ties back to what Scott was saying, is that stock status -- Landings is going to be highly correlated with stock status, and economic value is going to be correlated with landings, and so, to me, it seems like the natural siloed approach to this would be to look at the stock status, to look at the landings, to look at the economic importance and value impact of that, and then look at the social, because it kind of -- I hate to use this term, but it trickles down like that. I don't see how you can have social importance as a major factor without economic importance, and you can't have the economic importance without the landings, and you can't have landings without good stocks, and so that was kind of the natural thought process that I was thinking of.

DR. CROSSON: Adam, that was very well put. I agree with that.

DR. STEMLE: If it were up to me, I would say that we would look at it from the reverse order that's on the slide, essentially, and those kind of lead to where I guess the decision tree would navigate you naturally, I think, because you look at the stock status, and you make those decisions based on that, and then, eventually, it's going to kind of lead you into the same questions with the landings and the economics, but I guess that would just be my overall thought, is go siloed and start with stock status and then go down to social.

DR. SCHNIER: Can I ask a question? I just came back for this discussion, but, when I was looking at the document here, it appears as though landings was preceding stock status in the presentation, and I thought that it has some language here referencing that we were doing that first. I see the logic that's coming through, but, the data informing stock status, is that not landings data?

MR. HADLEY: It depends, and so, for the non-assessed species, you're going to be relying on landings. For the assessed species, you're going to be relying on the stock assessment that includes landings, but are there other variables that go into that model to make that determination?

DR. SCHNIER: Okay. Thanks. That's the only thing I was thinking relevant to the order there. Thanks.

MR. HADLEY: Right. No, that's a good point, and I appreciate you bringing this up, because this is something that, personally, I hadn't thought about at all, but it does matter which order the different decisions are presented, and so I certainly appreciate this discussion.

DR. CROSSON: Any other comments from the committee? How about Mike, John, and Christina? Do you feel like the committee has answered most of the questions that you have posed to us?

MR. HADLEY: I do, and I certainly appreciate the discussion.

MS. WIEGAND: I second John. I feel like we got a lot of really great input from you guys, and so thank you.

DR. SCHMIDTKE: I agree. I'm comfortable with the feedback that we've gotten, and so thanks, everyone.

DR. CROSSON: All right. Good. I know we just had lunch a few minutes ago, but we're going to shift over to another new presentation, and so we'll take like a five-minute break here and try and come back at least by 2:30, at the latest, so we get ourselves set up here.

MR. HADLEY: Okay. We're reconvene at 2:30. We'll come back at 2:30.

(Whereupon, a recess was taken.)

DR. CROSSON: Welcome back, everyone. We have a presentation from a large group here, but I guess Matt McPherson, from the Southeast Fisheries Science Center, is going to be doing it, and this reminded me, because this is the last work trip that I took, right before the lockdown started in the spring, and so, Matt, if you're ready to go.

DOLPHIN WAHOO PARTICIPATORY WORKSHOPS

DR. MCPHERSON: Yes, I'm ready. I will be doing half of the presentation, and then Mandy Karnauskas will be doing the other half of the presentation. Unfortunately, I can't see who all is involved in this meeting, but, for those of you who don't know me, my name is Matt McPherson, and I'm an anthropologist, and I lead the Social Science Research Group at the Southeast Fisheries Science Center.

Today, I'm going to talk about the dolphin wahoo participatory workshops that I have been working on with Mandy, as well as a large group from folks from the South Atlantic and as well as the Science Center. The initiative is largely inspired by ecosystem-based fisheries management and the attempt to do some interdisciplinary research, and we have used this participatory modeling approach that I am going to present first working on snapper grouper fisheries over in the Gulf, and I think this is the second fishery that we've been working on, but we have some plans to do some other work along these lines, and so it's kind of an evolving process that we're going to talk about today.

I think Julia gave you a little bit of an introduction to this process, this project, this morning, but the goal has really been to increase the communication flow between scientists and managers and fishermen in support of the improved management of fisheries resources, and kind of the core of the approach is developing conceptual models, in this case of the dolphin wahoo fishery, and we -- The original idea was to do it both in -- Do in-person workshops, both in sort of the North Carolina/Virginia area as well as down in the Florida Keys, to sort of be able to see how people's perceptions of the system differ in those two areas.

We're using this conceptual modeling approach to look at things like what are major factors that affect the fishery, where do some of the risks in the fishery lie, what is valued in the ecosystem, what other kind of targeted research may be needed, develop hypotheses, how changes in ecosystem affect local businesses and communities, and how folks perceive that environmental factors are affecting the fishery.

As I mentioned a moment ago, the plan was to do a set of workshops in North Carolina and Virginia and then another set of workshops in the Florida Keys. We actually were able to pull off the workshops in North Carolina and Virginia, and we went to Beaufort on March 9, Wanchese, and Virginia Beach. As soon as those workshops were over, everything shut down, because of COVID, and so I literally think it was like two or three days after I got back from Virginia Beach that I went and shut down my office.

We had originally scheduled the Keys workshops for the summer of 2020, but, of course, COVID impacted our planning for those workshops, and so we postponed them. We were hopeful that maybe this would lift, and we would be able to go down there and do them in person, but, finally, we decided that we needed to try to come up with a virtual format to do this. We approached it in a little bit different way, but using interviews and a group webinar that I'm going to discuss in a little more detail in a minute.

In terms of the participants in these meetings, in Beaufort, we had seven industry participants who were primarily for-hire and other recreational fishermen. In Wanchese, we had fourteen industry

participants that were a mix of commercial and for-hire. In Virginia Beach, we had four, a small one, but we had a very good discussion there, and then, in south Florida, so far, we've been able to contact eleven industry participants from areas ranging from Jupiter down to the Keys, and, there, there really isn't much of a commercial fishery, and so it's all been both for-hire as well as private recreational fishermen.

Just to give you a little bit of a flavor of how these workshops work, we start with a main feature of the ecosystem, and, in this case, it's the dolphin wahoo populations. When we do this in-person, we have a lot of sticky notes that we write things on, and so we start with one, and then we brainstorm what are all the different factors that are impacting the population abundance and impacting this fishery, and we start to pull those up and stick them on the whiteboard, or on the sheet of paper, and then, little by little, we organize them, and we talk about what are all the different relationships, and what are these different things related to, what are they driving, and how they're sort of interconnected. We start to draw these arrows and lines up on the board and connecting all these different ecosystem components together.

By the end, I'll show you what the final model looks like, in a second, but just to mention the approach that we used in south Florida, and this is pretty much the way that Mandy and I look on a daily basis right now, and probably the rest of you do as well, but we were making phone calls with individual fishermen, and so we had interviews with them, asking kind of the same questions that we would have asked in the workshops, just getting them talking about the fishery, what their perceptions are, what are the drivers, what are the different factors, what are the different impacts and changes in the fisheries.

Then we actually converted those interviews into a draft conceptual model ourselves, and, actually, it was last night that we had a group webinar, where we brought everybody back together to take a look at our draft conceptual model and to go through it and make sure that we got things right or to correct the things that we had wrong, or things that were missing, and so there are actually a number of things that we didn't get quite right that we learned about last night, and so we're in the process of finalizing that conceptual model, based on that different virtual approach.

This is what you end up with as an end result, is a conceptual model, and you can see that here we have physical factors, biological factors, and socioeconomic factors and the interrelationship between all those different factors in the fishery, and this one is from the Beaufort workshop. Don't worry, and I'm not going to try to talk you through all the different components of this particular conceptual model.

Something else that we did in these workshops is we did some participatory graphing, where we asked participants to plot the importance of different species to their fishing operations throughout the year, and also trends in local abundance for dolphin wahoo and other species. We weren't able to do this in south Florida, because we weren't able to find a way to do this virtually.

Anyway, that's sort of the essence of the method and what we did, and we're going to go forward now, and we're going to talk to you about the results that we have so far in the process, and I'll show you the model structure and some of the overall population trends that we got from folks, and I will provide a summary of the North Carolina and Virginia results, and I will also provide a summary of the south Florida results. We're also going to discuss something that we're calling the social media analysis, which is where we actually collected photos of landings from charters,

on Facebook and other social media, and we counted the pictures, and we'll go into more detail in a minute. Then we'll provide a summary of some of the themes that have been emerging from the results that we've compiled today.

I do want to -- In terms of some caveats, I want to point out that these are the perspectives of the workshop participants. They're not known truths, and so we're looking for issues, for example, that warrant further investigation. We're very careful, in these workshops, really not to talk, and these workshops are not for scientists to talk to the fishermen about what's going on or to tell fishermen what's going on. It's really just to ask questions and listen to what the fishermen's perceptions are of the system and what the changes are and what's happening in the system, and so we're very, very careful with that.

The other thing to point out is that these perspectives are sort of regionally specific, and so it actually is notable, as one of the results, how different these models can look, just going from one area to another, even if those areas are fairly close to one another, like Beaufort and Wanchese, let alone going from North Carolina down to south Florida, and so the perspectives are regionally specific, and some of the conclusions don't necessarily represent the average over the whole management area, but the differences between perspectives in the regions, or between the different areas, are actually quite interesting, and I think they provide some interesting information about how the fishery functions.

After doing four conceptual models, there's kind of a general structure that all these models ended up having, and so there's kind of a basic structure. All the discussions ended up focusing on local dolphin abundance, and not the broader Atlantic-wide population of dolphin, but it really came down to local dolphin abundance. Then, here, in the circles on the outside, you can see the thematic areas emerge that impact this local abundance, and then sort of the difference is the way that these different themes kind of broke up in each of the different areas. In each one of the areas, there are sort of different components that constitute each one of these themes, and there are different relationships and different areas that are emphasized.

In terms of just some overall perceived abundance trends, and we got this from the participatory graphing and the interviews and the conceptual modeling process themselves, as I mentioned, the observations were largely attuned to local abundance, and there really were relatively few insights on the overall stock abundance in the Mid-Atlantic for both of the species.

You can see here an example from the Beaufort workshop of those, and you can note, in this example, that people perceive that, across the board, the wahoo population trends have been gradually moving up, and, although there are some differences in the model, regarding sort of the patterns of change in the dolphin population over time, the general trend in Beaufort is that the population has been gradually decreasing.

In Virginia Beach, there wasn't any perceived change in either dolphin or wahoo that was mentioned. In south Florida, there is the feeling that there is a major decrease in the abundance and in the size of dolphin that started fairly recently, about five to ten years ago, and some of the fishermen we interviewed can even pinpoint specific years where they sort of began to notice an abrupt change in the dolphin population, but, on the other hand, they have not noted any change in the wahoo population, and the same pattern in the Florida Keys. For south Florida, we're talking

more like Fort Lauderdale sort of up to the Jupiter area, or maybe including Miami, and then, of course, the Keys.

Just to provide a summary of some of the results from the North Carolina and Virginia workshops, we asked them which species do your businesses depend on throughout the year, and we asked folks to graph out sort the dependence on species ten years ago in Wanchese, and there are some pretty remarkable differences. The shaded area represents the standard error from the different graphs that we received, and so I will take that away, and you can see that, ten years ago, tilefishes were particularly important in the summer, but throughout the year, and tunas, and you can see dolphin in sort of the purple, a little bit lower. You can see that it's different, substantially different, in what they mapped out for today.

For the commercial fleet, at least in Wanchese, it looks like there have been substantial shifts that have occurred in the last ten years, and there has been historical reliance on tilefish, tuna, and sharks, and a low dependence on dolphin, but, in the present context, there's been significant increase in the reliance on dolphin in the summer and shrimp in the fall.

If we combine the three conceptual models that we developed in North Carolina and Virginia, and we pull out particular segments based on theme, we can compare the items that are mentioned in one, two, or in all of those different areas, as well as the linkages that were discussed in those meetings, and so, by doing this, for example, the model shows access to other species. In this case, tuna and blueline tilefish is perceived to affect effort on dolphin, and so, in this case, in this particular case, from our discussion, they talk about how limitations on bluefish and tuna have increased effort, commercial effort, on dolphin in recent years. In Wanchese in particular, they mentioned that increases in shark abundance have limited areas where the commercial fishing can occur, and, thus, affecting overall effort and efficiency of fishing for dolphin.

There was also a lot of discussion about regulations, of course, and economic factors, but the regulatory levels and economic factors, like market price of dolphin and cost of entry into the fishery are definitely perceived to influence the level of entry into the fishery.

If we do the same thing with the recreational fishery, which species do you depend on throughout the year, we compare here the three regions, and we can see that there's a high variation across these regions, or we can call them areas, but even these three areas that are relatively close to one another display a high degree of variation, in terms of the species that they depend on and they target throughout the year.

It's kind of interesting, and, again, these are just coming from these graphs that we asked the participants to make regarding what species they depend on throughout the year, and you can see a clear pattern of the later arrival in dolphin as you move farther north, and so you can see, for example, in Wanchese, that the dependence on dolphin comes earlier in the year -- Well, no. Let's see. Dependence on wahoo I think is earlier in the year than in Virginia Beach, for example, or definitely there's a difference between Beaufort and Wanchese and Virginia Beach, in terms of the months that they are dependent on these species, and there's especially high dependence on dolphin in Wanchese during the summer months.

If we do kind of the same thing with the recreational conceptual model that we did with the commercial social model and bring them all together, we can see what were the factors that were

mentioned in one of the areas, what were the factors that were highlighted in two of the areas, and what were the factors that were highlighted in all of the areas in our discussions.

There was a discussion regarding what is perceived to be a very substantial recent increase in recreational fishing effort that locally is driven by factors such as coastal development, the distance from fishing grounds, the mobility of anglers, which has increased greatly, and the level of fishing power and new technologies that allow recreational, private recreational, fishermen to fish more efficiently and at greater distances and depths than in the past, and this -- Here, we're talking about -- This was something that was discussed quite in-depth in North Carolina and Virginia, but we had a conversation last night with the folks from south Florida, which was really quite remarkable, in terms of their expression of the increase of effort of private recreational fishing in the region, alarming, I would say.

Here, we can see that Wanchese focused more on the abundance of large dolphin as being important to them, and that seems like it's -- At least in the workshop, it was expressed as a source of conflict between the commercial and the charter/for-hire fishers there, and there was a perception that the commercial fishermen are targeting the large gaffers, and that is affecting the ability of the charter fishermen to catch larger dolphin, and that is affecting their business, because it affects, among other things, customer satisfaction, and so that was a big topic of discussion in Wanchese.

In contrast, in Beaufort, the emphasis was more on the ability to access and catch dolphin throughout the year, and so they were very concerned about having access to dolphin throughout the whole year for their businesses.

Again, there were factors that were perceived to increase effort on dolphin across all regions, which, again, included the level of regulation, and it included opportunities to fish for tuna and marlin, and so, in all regions, tuna and marlin were identified as sort of the main fishery that recreational fishermen like to target, but, in the absence of those, or as a complementary sort of species to target, dolphin is extremely important, or, in periods where tuna and marlin opportunities may not be available, then they like to target dolphin, and the strength of the economy in general was mentioned as a factor that impacts both demand for charter trips and private recreational effort on dolphin, just because, when the economy is going well, there are a lot more people who have money to get boats and afford fuel and go out fishing or be able to afford a charter trip.

Here is the summary of the Florida conceptual model, and you can see that, despite the fact that we used a different approach with interviews, we were still able to produce a conceptual model that was similar to what we were able to produce up in Virginia and North Carolina, and so, in this process, and we're still kind of processing the information that we got, but there were some fairly clear differences between south Florida and North Carolina/Virginia.

In the first place, and I think I mentioned this before, in south Florida, there was a major concern about local and regional depletion of dolphin, and there was quite a bit of consensus about support for stricter regulations, of dolphin in particular, and not wahoo, but dolphin. They mentioned commercial fisheries, in the context of affecting their larger stock abundance, and so there were -- There was mention of commercial fisheries up north and down south, but there is no commercial fishery in south Florida, and so the commercial fisheries are mentioned in the context of the broader, Atlantic-wide stock.

There is more homogeneity, in terms of the drivers of recreational effort, things like distance from shore, coastal development, and those kinds of things are much less variable across the south Florida region than they are in the area where we were up in North Carolina and Virginia. There is a bigger emphasis on physical and biological drivers of dolphin distribution and the areal extent, and that was something that we were really struck by, I think all of us, in doing the models up in North Carolina and Virginia, is that the biological -- The physical and biological components and themes within the model were very sort of sparsely developed.

It was all about the socioeconomic drivers up in those areas, but, in the interviews in Florida, there was much more discussion and much more emphasis on what might be going on, from a physical and biological standpoint, that might be affecting the local population, and they had a number of unique hypotheses regarding dolphin and wahoo biology in relation to depletion.

As I just mentioned, there was a lot more discussion in south Florida regarding the physical and biological drivers of dolphin distribution and how those affect the sort of realized availability for recreational and commercial, or charter and recreational, fishermen in south Florida, and there were a wide range of factors that were perceived to be influencing the area of dolphin distribution, and there were a lot of hypotheses that were brought up by the folks that we interviewed that focused on the impacts of reduced school size, the impact of changes in prey and the survival of spawned dolphin eggs, as well as how prey outbreaks, in response to smaller dolphin populations, has led to increasing wahoo populations, things like that, and that's much more Mandy's area of expertise than mine.

From a perspective of social and economic findings, one of the things that was emphasized there is that dolphin play a unique symbolic and economic role in local communities and in local recreational fisheries, and so mahi is very, very important, kind of from a symbolic standpoint, and I know, in the meeting last night, folks were talking about how mahi is used as a symbol for a lot of these companies down here that run tournaments, and they put mahi on their t-shirts, and it's just very sort of uniquely important down here in south Florida.

There was discussion about how the effort and cost to catch dolphin is probably increasing in light of the perceived depletions, and it seems that the type of charter clientele in south Florida is quite different than North Carolina and Virginia, and so that affects customer satisfaction. We received real strong comments, up in North Carolina and Virginia, about how important those bag limits were, both for individuals and at the trip level for charters, that their clients wanted to take a lot of mahi home with them after their trip, but that, although that's not completely absent in south Florida, it seems like most of the tourist demand is more for kind of getting out on the water and going fishing.

They talk about their fishing trips being much more opportunistic, in terms of what they target and customer satisfaction not being tied so much to the volume of fish that they're able to take home, and, as a matter of a fact, probably most clients in south Florida aren't taking any fish home, or they're just catching enough to go to the local restaurant and get it cooked up and have a big meal after they go fishing.

There were similar concerns regarding the growth in number and power and efficiency of private anglers and as well as spearfishing activities, and, I mean, the descriptions of the congestion and

the struggles that the charter guys go through just to find sort of a non-congested area to fish were very extensive, and very detailed, and so that's a major problem that they're confronting down here in south Florida, and, again, in comparison to North Carolina in particular, there isn't a local commercial --

The local commercial fishery down here is minor, and so they talk about increase in local imports related to restrictions of sales in dolphin charter trips, excess to restaurants, and apparently, some ten years ago, or more, the charters were able to use the excess bag limits that their clients didn't want to take home -- They were actually able to sell those to local fish houses and supply local restaurants with fresh dolphin, and so that's no longer an economic activity that's available for them, which is something that they say has impacted their bottom line. Now I'm going to turn this over to Mandy, and she's going to talk about the social media analysis.

DR. KARNAUSKAS: Thanks, Matt. As Matt mentioned, we conducted a social media analysis, and this exercise was not part of the original workshop plan. This idea actually came from the fishermen in the workshop, and so it was in the context of some questions about usage of the species, how representative the perspectives of the workshop participants were, and how the charter operations vary across the region.

Essentially, what we did was we counted a bunch of social media photos. Now, these were selected -- This is a census of photos from selected marina websites, and so we started with an initial list of the focus areas in both North Carolina/Virginia and south Florida and the Keys, and we looked at -- We found marinas and websites in those areas where they posted frequently, sometimes up to several times a week, and then we did a full census count, taking all those photos and dating them. When I say we, I should actually say Anthony Mastitski, who did a great deal of this work, and so, in all, we counted almost 4,000 photos, and you can see the breakdown by area here.

There were 65,000 fish, and these were from thirty-nine species or species groups. What I'm showing you on the right here is a plot of the raw data and to be able to visualize this mess of data. First, I'm going to show you a plot where we've broken the raw data down into fifteen-day increments, so you can see how the trends move across the year, and then we also fit a smoother to the data points, so you can kind of get a better idea of the seasonality of the different species.

This is a breakdown for south Florida and the Florida Keys on the left and Morehead to Virginia Beach on the right, and what I'm showing you here is the proportion of catch, and this by the total number of fish that were caught, and this is for the top-twelve species in both regions. Again, what you're seeing in the top and the bottom is the same data, just plotted in different ways, either actual proportion of catch by those fifteen-day increments across the year or a statistical smoother that is fit, and you can kind of see the seasonality better in the bottom version of the plots.

A couple of interesting that jump out here is the prevalence of dolphin, and it's obviously the major -- In terms of just raw numbers, it's the most commonly-caught species in both areas. Interestingly, wahoo actually comes in twelfth in south Florida, and it's fifth in Virginia Beach, and so less prevalent, in terms of numbers, which isn't surprising, and then you can see some interesting patterns in the seasonality below, with slight differences in the times of year that the species are caught.

We can also break this down by occurrence, which yields some different patterns, and so, here, we're just looking at the number of times that the species occurred at least once in the photo, and, again, you see dolphin is still in first place in south Florida. It actually bumps down to second place, when you look at it in terms of occurrence, and so tunas actually are more prevalent in the catch in Morehead to Virginia Beach, and then wahoo actually moves up a little bit. Obviously, wahoo, due to just how difficult they are to catch and the bag limits, they're obviously not caught in such great numbers, and so they move up a little bit when you look at the data in terms of occurrence.

Again, you can see that seasonality, in terms of occurrence -- In the bottom charts, you see, for example -- You can see the big spring peak in the king mackerel in the south Florida region, and that species also moves up when you look at the data in terms of occurrence, and these are all the species for occurrence rates over 4 percent.

We can also break it down and look at when dolphin were present in the trip and how many were in the trip, in the photo, and you can see, from Morehead to Virginia Beach, there's a pretty wide spread, but a median of ten, whereas, in south Florida, it's such smaller, a median of four, and this really reflects a lot of what we heard in the workshops, Morehead to Virginia Beach being a real meat fishery, and they're often targeting these large numbers of mahi on each trip, although the median is relatively small, and it's only ten, and you can see there's a substantial number of trips where they're actually targeting forty, fifty, sixty dolphin per trip, whereas, in south Florida, we were hearing a lot of captains that we're really lucky when we can even find four or five dolphin on a trip, and that seems to be sort of the overall median, and never did we see -- I think the max was forty-five on a trip for south Florida.

We can also look at the seasonality, and so Anthony did make an effort to break out the dolphin in terms of large and small size classes, and I think the cutoff was about fifty centimeters. Of course, this was approximate, because there was no standard reference within the photos, but, anyway, this is the seasonality for the different size classes. A couple of interesting things pop out here. Matt talked earlier about some of the conflict in North Carolina with the commercial and the recreational, especially in the Wanchese area.

Targeting those gaffers seemed really important to both fisheries, and you can see kind of a slight dip in the recreational catch in that same timeframe, June, where the commercial fisheries are showing their big dependence on mahi in that same month, and so I'm wondering if that little dip you see in the Morehead to Virginia Beach might reflect some of that localized depletion in the large gaffers that we heard about in the workshops. Then, in south Florida, again, reflecting what we're hearing, there is big concerns about absence of gaffers, and you see there's a lot more bailer size classes in the south Florida -- Or schoolies, as they call them in south Florida.

We can also look at the catch composition, and this is done on the basis of occurrence, and so just whether or not the species appeared in the photos together and not in terms of the number of fish that were in the photo, and this is a hierarchical clustering analysis of the species in the photos, and so a couple of patterns. You can see here that dolphin, highlighted in the red boxes, and the wahoo is highlighted in green, and, in both cases, Florida, as well as up north, you see that dolphin are basically being caught with tuna.

Interestingly, the wahoo are being caught with different suites of species. In Florida, they tend to be caught with skipjack, cero/Spanish mackerel, and barracuda, whereas, up north, they're being caught with king mackerel, and this is probably a function of the seasonality, that these species have very different seasonality. King mackerel, in south Florida, tends to be a spring fishery, whereas the wahoo are being caught in the winter, or sometimes in the summer or fall, and then, again, in Morehead and Virginia Beach, those seasonalities are lining up.

I can see this catch composition being useful, in terms of trying to understand sort of domino-effect impacts of any given regulation. For example, if there are regulations on wahoo, you might expect there to be some potential impacts on skipjack tuna and cero in the Florida Keys, whereas you would see other impacts on king mackerel up north, and so there would be differential impacts of regulations on these species based on the trip composition.

Then, lastly, we did an ordination analysis, and so we did a non-metric multidimensional scaling, and this was done on the seventeen species, or species groups, that were common to both regions, and so, in other words, any differences are not differences in the types of species that live in the regions, but the way that those common species are being used.

If you're not familiar with ordination analysis, essentially, each dot represents one of those photos, and, the further away the dots are, the more dissimilar the catch composition in those photos are, and then points that are very close to each other represent photos that are very similar in composition, and the ellipses are one standard error ellipses, and so you can get a sense for the variation around those dots, and we have color-coded them here by, in the upper-left, region, sub-region, year, and month, respectively, and this gives you an idea for how influential each of those factors is on the catch composition, and then those R values describe the variances explained by each factor.

What you see is that year really doesn't explain much variation. Month explains some of it, but where we saw the big differences was actually in the region, and even more a little bit in the sub-regional, and so there is a lot of sub-regional variation in how the different species are being used, which, again, reflects a lot of what we heard in these conceptual models, even just going from Beaufort up to Wanchese, and we heard substantially different things. There are a lot of differences in the conceptual models and a lot of differences in the way that these species were being used.

Then, finally, just to look at the workshop input versus the social media, again, looking at the combined mapping that we did in the workshops, on the top, and these were the top six species that came up of dolphin wahoo, snapper grouper, billfishes, tunas, and king mackerels. Obviously, you're not landing billfishes, and snapper grouper are sort of a big species group class that we broke down when we counted the photos.

If you just look at the top four, and you compare the seasonality trends from the maps that were done in the workshop on top, with the seasonality trends coming out of the social media analysis, you can see they're quite similar, and tunas tend to be pretty prevalent all year, with a slight dip around July, August, and September, and king mackerel, for example, is not very important at the beginning of the year, and they tend to wrap up a lot around October and November, and so you see a lot of similarities between the workshop input and the social media, which led us to think that the workshop input was pretty representative of broader trends.

That's the end of the social media analysis, and now I'm just going to try and summarize kind of everything we've seen today. This is a summary that we prepared of some of the physical factors, just the physical factors that were brought up in each of the four regions, and, again, you see a lot of similarity between Beaufort, Wanchese, and Virginia Beach, with some exceptions, but, as we discussed earlier, in south Florida, there was a much wider range of physical factors that were discussed, and there were some unique physical factors that only came out in south Florida and were not mentioned in the workshops up north.

Then this is a summary of the sort of regulatory impacts that we felt would be expected from looking at the conceptual model, and this reflects the way that people thought that the different components link together, and, also, some of the preferences that were stated about regulations, and I don't know if -- Maybe, to save time, I won't read through all of this, but, just as an example, bag limits in south Florida -- Folks expressed that they thought an individual bag limit was okay, and they could live with a reduction, and they often tended to support a much smaller trip, whereas, in North Carolina and Virginia --

Again, we talked about that really being a meat fishery, and a lot of people talked about just even the possibility to catch large amounts of dolphin was really important, and so they expected that reductions in bag or trip limit would be linked to reduced customer satisfaction and actually impact charter demand there and potentially put people out of business, and so, again, to save time, I think I won't go through the whole slide, but you guys can go back to the presentation and look at the different regulatory impacts that our work would suggest on the different regions.

Then, just to try and summarize some emerging themes, in North Carolina and Virginia, there were a number of factors that were influencing commercial and recreational usage of dolphin and wahoo, and they are highly variable in time and space, and so I kind of envision this patchwork of factors, where we have some of the factors converging, and we get local depletion in some areas, and then, in other areas, the factors are not working against each other, and you don't have these issues with local depletion, and that was the kind of sense we got, and so you can get a high concentration of effort and local depletion of dolphin at small scales, even if the overall effort or catch is not increased.

Again, we talk about North Carolina and Virginia really being focused on a meat fishery, where the charter demand is being driven by tuna and dolphin, and a lot of concerns about accountability, particularly regarding overall recreational effort, and that was something that came across in all areas up north, and, overall, relatively little discussion of wahoo.

Then, in south Florida and the Keys, what was really notable is that perceived decrease of abundance, particularly the large gaffer dolphin and increasing school size. Again, those changes -- Some folks felt that they started around 2010, but a lot of people saw really marked change starting around 2015, and we talked about some of the competing hypotheses surrounding dolphin depletion in that area.

As opposed to the meat fishery, south Florida is really more of a tourism-driven fishery, and dolphin plays a really unique role as that tasty and charismatic species, and it's just very iconic and popular, and there were concerns about the impact of commercial fishing, both within the South Atlantic jurisdiction but also the impacts of international fishing, commercial fishing, particularly in respect to the overall Atlantic-wide abundance, and we also heard more discussion

of wahoo from private anglers. There is some concern about wahoo impacts from spearfishing and high-speed trolling, which is apparently kind of a rage for the past five years.

The next steps is to finalize the south Florida analysis. As Matt mentioned, we just had the webinar last night, and so, obviously, we haven't had time to do everything that we need to do and correct that model and send it back to folks for final input, and so we'll be wrapping that up in the next couple of weeks.

We also want to start exploring some of the major hypotheses. Some of these hypotheses brought up by the fishermen can be easily tested with the data, and so we plan to at least embark on that for some of the major hypotheses, and then we'll put together a final report for the council in the next few months, and I think that's it. We just want to acknowledge our funding sources, the Marine Resource Education Program that was funding the workshops, the in-person workshops, and Dewey Hemilright, who was the fisherman who gave us the idea for the social media analysis. Thank you very much.

MR. HADLEY: All right. Thank you, Matt and Mandy. We appreciate that. I will pause, while the slides are still up on the screen, to see if there are any clarifying questions on the presentation, and then you do have a series of discussion questions, which I can toggle over to, once we get into that. They're in the agenda and overview document, and I can pull those up, if we want to go that direction, but I want to take some time to pause for questions, certainly, for Mandy or Matt on any of the results that were just presented.

DR. ROPICKI: I had a quick question. You mentioned regulatory changes having an impact in the Virginia area, the Virginia/North Carolina area, and were those commercial regulations or for-hire, like the blueline tilefish stuff that was mentioned, and there was something else.

DR. KARNAUSKAS: Andrew, are you talking about on the summary slide that I flew through or something that was further back?

DR. ROPICKI: I think it was in the summary slide, or maybe one more slide down, and I think there was something -- There were changes in regulations related to -- I want to say it was blueline tilefish or something, and it was in the conceptual model.

DR. KARNAUSKAS: Okay. That would have been commercial. If it's blueline tilefish, that was a commercial issue. Regulations that had been put on blueline tilefish and -- That was not a recreational issue.

DR. ROPICKI: Okay. Have you thought about like looking at either logbook or trip ticket data, to see if you can find changes in trip-level characteristics based on those?

DR. MCPHERSON: We haven't done that yet, but that's what we say the next phase would be, to sort of take some of the hypotheses that we learned from this process and then maybe start to explore them with more data, and so this would definitely be one. It seems like those North Carolina workshops were a very long time ago, and so we do have all of this documented, but there seems to have been -- I don't remember all the details, but there was the change in regulations on the blueline tilefish, and that seems to have moved a lot of fishermen into the dolphin commercial fishery, if I remember correctly, but I don't remember all the details from the workshop. Maybe

somebody else who is more familiar with the fishery, and maybe John, remembers the details of that.

MR. HADLEY: Regarding blueline tilefish and whatnot?

DR. MCPHERSON: Yes, and the tuna.

MR. HADLEY: I think that has a lot to do with switching -- That fishery was a -- I think there was a lot of effort that was added to the fishery, and then it became a very important species, and then, eventually, there were necessary cutbacks, due to the results of the stock assessment, and so that's kind of where that occurred, and then some very restrictive trip limits that had to go into place to help with the blueline tilefish stock, and that's something that I think caused -- In general, that discussion revolved around a larger discussion, inclusive of blueline tilefish, but other species as well, and we heard that fishermen are sort of getting squeezed out of some of the other fisheries that may be more highly regulated, or may be in a rebuilding process, where they have restrictive quotas or annual catch limits, and going potentially into the dolphin fishery.

That is, as it's currently laid out, an open-access fishery, and so I think -- There again, that was a discussion that happened several months ago, but that seemed to be my recollection of it, and that was kind of the point that was brought up there, that that might be one of the reasons that you do see new entrants into the dolphin fishery, and that little -- The rectangle next to the blueline tilefish photo, the number of council boats, council boats being boats that don't necessarily operate within HMS fisheries, but are fishing pelagic longlines for dolphin, and so I think that's what that discussion focused on and the reason that you're seeing some new entrants into that fishery.

DR. ROPICKI: Thanks.

DR. CROSSON: Perhaps we should go to the discussion questions now.

MR. HADLEY: Sure. Give me just one second. I believe that everyone should be seeing the discussion questions for this agenda item I will try to zoom-in a little bit more there, so they're a little bit larger on the screen, but looking at just some general feedback from the SEP on this approach and the utility going forward.

I know, speaking personally, this has been -- This is something that, being the species lead for the dolphin wahoo fishery management plan, and also working on the economic analysis, this is work that I -- If there are no major issues identified, this is work that we could certainly bring into the fishery management plan amendment process and into management and into analysis of the effects of management, but we're asking for general comments on the utility and application of the findings, and so to inform managers, set research priorities, and additional analysis on the economic effects of fishery management actions, and so that's some of the feedback that we're looking for.

Some potential uses that at least we had in mind, and when I say we, I mean on the council staff side, but we're looking for comment on the use of social media, and that's something that, as Mandy explained, sort of came up during the process, and I don't think that was envisioned in the very beginning, but the outcome of that has been certainly interesting, and I think helped broaden

the approach overall, but we're just looking for some additional input on that, if that's potentially a method that could be pursued going forward.

Does the SEP recommend considering this approach for future research into other council-managed fisheries? If so, are there potentially specific research topics for fisheries that the SEP would like to identify that could benefit from the application of similar research efforts? With that, I will hand it back over to the SEP.

DR. CROSSON: Thank you, John. What is the opinion of the committee?

DR. WHITEHEAD: I'm one of the ones responsible for writing this stuff up, or summarizing our discussion, and I'm an economist, and I really don't know what to write up. It's fascinating stuff, and I enjoyed the presentation, but I really don't know how it would be used, and so I will be typing up any comments that people have. Thank you, all.

MR. DIETZ: My first thought was this seems very applicable towards the dolphin wahoo fishery, given its large both recreational and kind of charter importance and kind of being trophy, in a way. I don't think this would apply very well to more commercially-important fishery, and that's just my thought, and then, additionally, just kind of thinking about social media analysis, and I thought of this as well when Chris was talking about citizen science informing in between MRIP waves, and is there any --

Has there been any discussion about how valid we view social media analysis about -- In terms of how far are we willing to use or extrapolate social media analysis before we don't feel comfortable basing management decisions on it? Does it need any sort of peer review, or does social media analysis more broadly need some sort of peer review concept? I guess I like it, and I think it's incredibly valuable, and I think it fills really important gaps, but my question was how much do we trust it, and how much are we allowed to trust it?

DR. YANDLE: It's only 7:30 in the morning here, and so my brain may still be a little bit fuzzy on this, but my thinking on this is that a lot of the information in this can be useful. I mean, I can see the economists' concerns about taking the perception data and yada, yada, yada, our normal discussion, but a lot of the information about what's harvested when and how they believe that has changed over time, how they see what's going on and how things interact, that information I think is really valuable for both thinking about setting up seasonality, seasonality from a regulatory perspective.

I think, also, some of the trends they're seeing and how they see things are different than they were in the past can be really useful, almost in terms of an early-warning system, and issues that may be coming up that the natural science has not yet formally caught up with and can be used to inform, depending on how you look at it, either the research agenda or things that we need to be thinking about, the regulatory agenda, and so that's just off the top of my head.

DR. ROPICKI: I was just going to say that I really like the social media analysis, but I'm wondering -- In the context that it was used here, for for-hire trips, if the new reporting requirements -- Although I think it was good data, will the new reporting requirements for that sector kind of make it not as necessary, at least in this regard?

MR. HADLEY: That's a good point, and that's something that we can keep in mind going forward. That's something that is new, and so that's going to be a fairly new data stream, and it would be interesting -- I am just kind of brainstorming here, and jumping into the discussion a little bit, but just looking at the social media analysis and how it compares, once we get a few years of data, and hopefully those would line up, but that might be an interesting use, in furthering on that comment that you just had, Andrew. It's almost like a verification tool, even.

DR. MCPHERSON: John, can I just say something about that? I mean, clearly, this kind of social media analysis is not something that we could replicate easily. I mean, we put poor Anthony through weeks of counting these photos, and, because he's a lifelong fisherman, he is uniquely skilled in being able to recognize all these fish, even when they're really pretty small, on a small picture, and so, I mean, it's not something that we would want to replicate in this exact way, but we are exploring what the utility of this kind of data is, and I think that's what the conversation has sort of been around, and, I mean, if it were really useful, there are clearly ways that we could automate this process.

We were convinced that pretty much all charters are putting these pictures up, and you can get a very localized picture of what's going on, in terms of the charter landings from these photos, but it was a big effort, and it would be difficult to replicate this frequently, unless we wanted to make Anthony completely crazy.

DR. ROPICKI: I just had one last comment in regard to Discussion Question Number 3 and kind of what John Whitehead asked, and I think, as far as making a recommendation, we have to wait and see, because it sounded like they've done the first part of this, and now they want to kind of go back and test hypotheses with the data, and so it kind of depends on how the second part of this research goes, I think, to know how well it works.

DR. CROSSON: I definitely think that, on the first one, setting research priorities, I think the idea that this be kind of not only the fishermen that are out there talking to us about changes that they've seen over hopefully a decent time period, shifts in the stock or whatever, especially with something that might be related to climate change and changes in distribution. I think that's one thing I would like to see this used as, as something that maybe there's some biological questions that we can narrow down here.

I'm not sure how that's going to aid in social and economic effects of imposed fishery management actions, unless it's just going to be noting that larger fish -- The fishermen in North Carolina depend on larger fish during a certain time period of the year, whereas the guys down south are not, and I guess it would be kind of a non-quantitative just sort of descriptive section noting that. Beyond that, I'm not sure what it can be.

DR. YANDLE: That's sort of what I was trying to get at when I was talking about you can use this as information to help you craft how you build the regulations, so that they're working better with the existing fishing patterns, or are you using them to adjust the existing fishing patterns, and it gives you that information about what people are doing when and why, and that's always useful information.

DR. CROSSON: In terms of Number 3, does the SEP recommend considering this approach for future research into other council-managed fisheries, any of the fisheries that seem to be not

responding to management measures very well, not rebuilding very well, I would wonder if this would be something that would be informative. Does anybody else have any thoughts on this?

MR. HADLEY: Scott, not to jump in here, but, maybe throwing something out there as food for thought or discussion, one thing that was appealing for both dolphin and wahoo is that they're a fairly data-limited species, as in they're a very popular species, but we don't have a stock assessment for them, and we're limited on the data for many aspects, and so I don't know if maybe that would be -- Furthering on your comment just now, if that would be something that may help focus a potential resource, if there is a known data gap for species, or a group of species, potentially.

DR. CROSSON: Matt or Mandy, do either of you have any questions or things that the committee is not really answering here that you were hoping to get from us?

DR. KARNAUSKAS: I guess I will ask one question about the potential use. I think one of the things that really jumped out at me, in all aspects of the analysis, was just how much variability there is across very small spatial scales, and so I would be curious to know if any of the panel members think that this work is at all useful for informing sort of the spatial scale of management or management action considerations.

DR. YANDLE: I think it absolutely is, because, again, you're systematically documenting and providing sort of a level of proof of what we hear informally a lot, and so, yes, being able to sort of show that this is the pattern and this is what people tell us and this is how it differs in these different places does provide evidence for some of that more finer-grain management, absolutely.

DR. MCPHERSON: I think that, clearly, this is sort of an initial exploratory stage, but it seems to me like it does -- As Mandy said, it does reveal a lot of localized differences, and it also shows that there's a really significant difference in this fishery between these -- For example, these two regions.

There is, I think, a difference in sort of the demand for the species, based on the local economies, and so it seems to me like -- I mean, this isn't the final -- It seems like this -- For me, this kind of work opens up questions that you would probably want to think about when you're regulating the species, and then you can follow-up on specific questions, like I think all of these -- The discussion of substitutes, for example, or shifting from one fishery to another. I mean, we heard a lot about that, and it seems like that might be something that this would lead you to want to explore, and so you could take this and then focus in on certain specific issues and then do more research on those with data, which I think is what is sort of the next step that we're going to take.

Now, there are lots and lots of hypotheses that have come out of this, but we're going to try to focus in on some of the real key ones and then follow-up and explore whether what the fishermen were talking about -- Whether we can find some of those things in the data, including some of the biological things and hypotheses related to what might be happening to that species in south Florida, because clearly there is something going on in south Florida related to the species, as well as some of the things that we heard about what the potential -- Whether there has been an increase in commercial effort and what some of the potential impacts of that might be and some other things, and so we're still sort of clarifying those, but I mean, I think what we were hoping is that it would provide kind of a broader picture and a broader context that could inform the discussions,

and future research as well, and so I don't know if folks see it as being useful, in that regard, or not.

DR. ROPICKI: I feel like it did that. I mean, that's what I was trying to say. I see it kind of as an exploratory tool, and what you presented seems -- I think it's -- I don't have specific examples of places to use it, but I think it's something that should be considered going forward.

DR. CROSSON: All right. I think we're done with this particular agenda item. Thank you for the presentations.

DR. MCPHERSON: Thank you.

DR. KARNAUSKAS: Thanks for your time.

DR. MCPHERSON: We appreciate the time.

DR. CROSSON: We do have one more regular agenda item, the fishery performance reports, and then we have some other business to get into. Should we take a five-minute break and come back at ten to? Let's do that.

MR. HADLEY: That sounds good. We'll get the last major agenda item queued up.

(Whereupon, a recess was taken.)

DR. CROSSON: The last thing we have now is the fishery performance reports, and, Christina, are you doing a presentation on this?

MS. WIEGAND: I'm just going to go over the document that was in your briefing book for you.

DR. CROSSON: Okay. Go for it.

DR. YANDLE: Am I the notetaker on this, Scott?

DR. CROSSON: I have you and --

MR. DIETZ: It's me.

DR. CROSSON: David. Okay. Whitehead too, if he's still around.

DR. WHITEHEAD: I'm here.

DR. CROSSON: Okay. All right.

MS. WIEGAND: For this presentation, we're going to be talking about fishery performance reports and how council staff might be able to better use them to explore the effectiveness of management measures, but, before we really dive into it, I want to give you guys some background on sort of why this has shown up on your agenda.

If you will remember, Gregg Waugh retired I guess almost a little over a year ago now, and, in his retirement, he left us a number of documents in hard copy, back to when he started at the council, before I was born, and so Tracy Yandle and I took on this project of trying to deal with this massive amount of hard copy material, and the project ended up being twofold. One was to find a way to digitize and archive that data, so that it was easily accessible for council staff, and the second part of it was creating a management timeline, and we started with the coastal migratory pelagics fishery, and I guess I should say, when I say Tracy and I did this work, I mean students of hers did the bulk of the work.

One of the things they did was put together this timeline of management for the coastal migratory pelagics fishery, and, to do that, they looked at the management measures that were implemented, the council rationale for implementing those management measures, as well as public perception of those management measures at the time.

About two or three weeks ago, we actually had that student present the management timeline to council staff, and one of the things I asked her to do during that presentation was to just sort of give us feedback on how she felt these timelines could be used for management and any sort of themes that she noticed throughout, because then, if -- She had to dig into meeting minutes, public hearing documents, summaries of public comment, just a huge swath of information and sometimes I feel like, as fisheries managers and fisheries scientists, we are really in the minutia of management, and, because fisheries management was not her background, we really had this unique opportunity to have someone come in with fresh eyes and look at the whole historical picture of the fishery and what was going on and provide some recommendations.

She provided a number of recommendations, but one of the things that really sort of struck us, as council staff, was this fact that it didn't appear that the council was ever going back and discussing whether or not management measures that had been implemented historically were effective or if they had achieved the intended goal. It wasn't ever really discussed or brought up, and she felt that was something that was really lacking in fishery management.

There are a number of different ways that council staff is looking at sort of bringing that information to the council, and one of the ways we discussed was incorporating some more questions into our fishery performance reports related to management efficacy, and we've talked about fishery performance reports a number of times, mostly in the context of the social and economic questions, and today I'm going to be going over more of the management-driven questions, obviously, but, since we've got some new people on the SEP, I wanted to give a brief refresher on what fishery performance reports are and sort of what the process is that we go through to gather the information.

Essentially, fishery performance reports are a way to summarize information from our fishery advisory panel members, to get at what they're experiencing on the water and in the marketplace, in order to sort of complement some of this more quantitative scientific and landings data, and these reports are all available on the council website, and they're also provided any time a stock assessment is getting ready to be undertaken, and we're also looking to begin to use them more to inform future council management decisions.

The process we go through to gather the information from the APs is fairly simple. Staff will prepare background information for them, and this typically includes general biology of the stock,

any stock status information, management history, as well as fisheries statistics for both sectors and information on economic performance, and that information is provided to them before the meeting, and then, during the meeting, we go over a list of discussion questions that have been prepared by council staff.

For the most part, these questions have been consistent across our FMPs. There are occasionally a few additional questions added, if there are specific issues we know are going to come up during the stock assessment, but, in general, they're fairly standardized, and they include questions about any landing and discard levels environmental conditions, ecology, social and economic influences, and then any other concerns or data gaps the AP feels need to be brought to the council's attention.

Again, during the advisory panel meeting, those questions are posed to the advisory panel members, and they're really allowed to have sort of a free-flowing conversation about their thoughts and observations, and then staff will take any notes we took, as well as the transcribed meeting minutes, and basically prepare a summary of the discussion that took place, and then that's what is termed the fishery performance report, and it's posted to our website.

Depending on the fishery, these are conducted either right before stock assessments or, for some of our smaller fisheries, like CMP, where we only have three species, we tend to try to update them annually, if possible, and so that was just a brief refresher on what the FPR process is, so that you can have that in mind when we're talking about these discussion questions.

What we have on the screen now are the current management measure questions that we tend to ask. We ask a lot about are the ACLs appropriate, are the quotas for each zone, for example, if we're talking about regional allocations, appropriate? Are there new management measures the council should consider? They're fairly broad questions, and so we would like to sort of work on revising that set of questions, to better get at this idea of management efficacy, and, to that end, we have a couple of questions for the SEP.

First, really focusing on whether or not we should rope the idea of management efficacy into the discussion of other questions, and, again, we've got sort of those different sections where we talk about catch levels and social and economic influences, and so, instead of having like a management measures section, explicitly asking say how have management measures affected the price or demand for shadow shark and things like that. If we should be asking them about specific management measures, instead of leaving it broad, and really getting into the nitty-gritty and asking them about specific things, like the shallow-water grouper closure and whether that's had a positive or negative effect on populations.

We also wanted to ask if there are any improvements that can be made to some of the current questions we have, and we use this term "appropriate" a lot, which can be fairly subjective, what is considered an appropriate management measure, so to speak, and so, again, looking at how specific we should really get with these questions, and so does the ACL match your perception of the stock? Is it too high, too low, et cetera, and things like that, and then the last two questions are a bit more broad. It's sort of looking at how staff can work to address some of the confounding changes.

We separate these questions out into different groupings, but it's clear that environmental changes can affect the value of a stock, which can also affect how effective management measures can be

and things like that, and so how staff should better work to make sure we're presenting the full picture and all of these sort of interrelated changes.

Then, lastly, and I know we pose this question to you guys a lot, but I feel like it's important with this kind of data, but how should the information gathered during this process be better incorporated into the management process? Again, we've primarily been using these to inform stock assessments, but we would like them to be incorporated a bit more in the management process, and, if you guys have any suggestions on how that can be done effectively, it would be appreciated.

That's all I've got for you. Like I said, we threw this together sort of last minute, after getting that presentation on the historical document timeline for CMP, but I'm happy to answer any questions that you all may have, and I'm looking forward to the discussion you might have on improving the questions we have for management measures.

DR. CROSSON: First of all, do you all have any questions for Christina?

UNIDENTIFIED: This is probably maybe a dumb question, but how -- Like, in one advisory panel process, for say a management plan under review, or a stock assessment under review, like how many FPRs do you end up with? Like how big is this stack?

MS. WIEGAND: It depends on the fishery, and so I would say -- For example, with snapper grouper, we've got two AP meetings a year, and I would say these fishery performance reports take a hour or two of a meeting to put together, and so it's not feasible to update those annually, and so, oftentimes, it's just one FPR that we try to conduct right before a stock assessment is about to begin, and we've only been doing these -- I think they started a little before I started with the council, and so we've only been doing them for around three years, and so most species only have one fishery performance report completed, if any. For some of our smaller FMPs, like the mackerels, where there is only three species, we are trying to update them annually, if possible, depending on what other priorities there are on the agenda for the APs to discuss.

UNIDENTIFIED: Got it. Thanks.

DR. CROSSON: All right. Should we tackle these questions?

MS. WIEGAND: I guess, if it helps, I can scroll up to -- These are the type of questions, again, that we have been asking the APs, when talking about management measures, and we're really looking to know if we should keep this section or if we should incorporate these questions into sort of the other sections, like social and economic impacts, catch level observations, and things like that, and if we should be asking questions that are a bit more specific than that.

DR. SCHNIER: I had a question that maybe you've addressed this before, but can you give an example of where you've used this to advise a bit better, to have a better understanding of these questions?

MS. WIEGAND: They've been primarily used, to my knowledge, in the stock assessment process, and I think their main purpose has been, when stock assessment scientists are looking at landings data, things like that, and they see an anomaly that's not readily explained, they will oftentimes

talk to the fisheries observers that are there and look at these fishery performance reports to see if there are other explanations or explanations that the AP has provided as to why they're seeing these sort of trend in landings, or these anomalies, that they weren't necessarily expecting in the data. As of right now, these haven't been heavily incorporated into the management process, but that's something we're looking to do, moving forward.

DR. SCHNIER: That's helpful. Thank you.

MS. BROUWER: I will just add to Christina's answer there. Another thing we try to do for fishery performance reports is to have the stock assessment scientists tell us if there's anything in particular that they want to hear about from the fishermen, and there's been a couple of times, and I think golden tilefish was one of them, that they had very specific questions for the fishermen, and so we always try to run the questions by them before we convene the AP, to make sure we're covering what they need to know. Thanks.

DR. SCHNIER: With that in mind, if we look at that first question, wouldn't that really be beneficial to talk about the management efficacy then, I mean just by the context of how you just described the use, at least for that first part?

MS. WIEGAND: In general, I do think asking sort of specific questions, like is the minimum size limit appropriate, can be helpful. I guess the question is, is that specific enough, or is it too specific, or should we be incorporating sort of not just is this appropriate, but has it been effective, and so sort of tying what the goal of the management measure actually was back in time and say is it achieving the goal that it was intended to achieve, and so I guess maybe we're trying to look at getting away from the term "appropriate" and being a bit more specific.

DR. CROSSON: I would get away from the term "appropriate", and I would ask something more specific, I guess, but it just depends on what the needs are of the council, and, if it's something along the lines of has the minimum size limit for X species changed the average size of the species landed, or has it resulted in larger discards than before, something along those lines.

DR. SCHNIER: I would definitely be a fan of having the definition of the management measure inform what specific questions you do ask, for efficacy. I think that would be appropriate. I'm not sure if it's a one-size-fits-all, because it depends on the management measure, necessarily.

MR. DIETZ: I agree with that, and it is interesting, the more I think about this, or I wouldn't be asking advisory members, if the goal of the management plan was to improve stock status to X level, and I wouldn't be asking them do you think this size limit has brought the stock status back to a no longer overfished level or something like that, and I think you do need to be careful about the types of questions you're asking and the type of subject matter you're asking on, if you're asking about management effectiveness.

If it's to increase access to the resource, I think that's going to be a better way to shape that question to them. Do you think you have better access to this fishery throughout the year, over multiple trips, and things of that nature, and so I guess just being careful about how you frame management success indicators, based on like what you're comfortable asking advisory members about.

MS. WIEGAND: Thank you, David. That's an important point, and I agree that we should be thinking about the best way to frame this, when talking to advisory panel members. I guess, if there's no other input on how to improve the questions, does the SEP have any comments on how we can work to make sure we're addressing confounding changes in sort of the interrelated nature of all of these different topics we talk about with the AP, particularly with the understanding that the effectiveness of management measures isn't always strictly tied to the management measure in place, and there's also environmental, as well as social and economic influences, that are playing a role in how we make sure we capture that.

DR. YANDLE: Aren't you guys asking about that separately somewhere? I thought that was sort of one those things, long-term, that we were trying to capture as it went, so we could figure it out in hindsight.

MS. WIEGAND: Right, and so we do ask all of those other questions. When we've been presenting the data, we sort of present it similar to what we were talking about with allocations, a very sort of siloed approach, and we present all of the economic information in one spot, all of the catch level information in another spot, and there's not really a part of the FPR where we sort of -- I would guess say tie it all together or present a larger picture, and we weren't sure to the extent it was important for us to be including that perspective in each of the FPRs or if it was just sort of, over time, all of that information is provided, and so it's not something we need to worry about sort of reconciling or noting each time around.

DR. YANDLE: I will be interested in what Jen thinks about this, but I would almost take the approach that you're really looking at the FPRs as sort of gathering some of the raw data, some of the raw information about what people are seeing, what they're observing, and then you guys are the ones who are going back and doing that analysis. So the question is do you want that as part of their analysis, or do you want just their observations? I can see arguments for doing that either way.

MS. WIEGAND: I would definitely be interested to know what others think, but, sort of off the top of my head, and I will say, when we do have these conversations, oftentimes, the different sections get sort of blurred, and AP members tend to talk about how environmental conditions are affecting catch levels, for example, before we've gotten to the respective sections, but, in general, personally, I feel like I would be interested in, in addition to sort of the raw data that we're asking the AO, to also sort of get their perception on how all of this is interrelated and affecting management efficacy as well. Again, I can see arguments for both, and I would be interested to know what the rest of the SEP thinks.

DR. CROSSON: Tracy and Jennifer, having the slide that Jennifer did this morning, the presentation she did this morning, about I guess the concern of shrimpers, justifiably probably, that a lot of the environmental conditions along the coast, the marshland disappearing and everything else, was affecting -- All the upstream stuff was affecting the shrimp spawning, and that was causing problems over time, and so like how did you get to that point?

DR. SWEENEY-TOOKES: That's where it's just always all tangled together, and so I am mulling this over as Tracy and Christina are talking, and the separating it neatly into different questions -- It doesn't happen, and so, a lot of times, I think, Christina, when you're asking Question A, and they start to answer Question L instead, that then falls back on you, as the researcher, to try to

figure out where does it actually belong in this management plan, because it's important. It's more information, but it's not clean.

MS. WIEGAND: You're absolutely right, and that's what happens a lot of the times. We're on Question A, and they're talking about Question L, because it affects Question A, and it gets messy, and I guess that sort of leads to my next question, and so, once we've gathered all of this raw data, what's the best way to present this to the council so that it can be actively incorporated into the management process?

Again, what we've been doing now is just sort of summarizing them, and we do include -- Sort of like you were talking about earlier, when we were talking about how to present the social information in the decision trees, we do include those sort of story quotes, or specific quotes, from AP members that we feel like really sort of illustrate a key point that was made during the discussion, but, again, if the SEP has any recommendations on sort of how we could better make sure we're consistently using these fishery performance reports in management. When in the management process should they be brought up? Is it being presented in a way that's really resonating with council members and things like that?

UNIDENTIFIED: Is it at all possible to think about frequency of teams that arise, I mean if you're asking this of multiple individuals? I can't imagine you do that, but --

MS. WIEGAND: Absolutely.

DR. SWEENEY-TOOKES: I was just going to say that's what I think you and I were talking about earlier, Christina, is the idea that it's entirely possible to quantify the qualitative, to find those key themes, and so, yes, and I think Christina does a nice job of doing that, and we see that in the reports that we get, the SEP.

UNIDENTIFIED: I'm mostly thinking like people have done word clouds, and it's trying to numerically put a number on it, as a quantitative piece, and, as an economist, I will apologize for trying to put a square peg into a round hole, but that's where my brain goes.

DR. SWEENEY-TOOKES: That's natural, right, and that's why I mentioned that to her earlier. It is okay to quantify the qualitative. I feel like we've five steps beyond the word clouds, but I like the way you're thinking.

UNIDENTIFIED: I'm sure you are, but this is just my simple way of thinking about it.

DR. SWEENEY-TOOKES: No, and I like the way you're thinking, and I hadn't thought about it that way, and so I'm glad that you mentioned that. Christina, I'm going to keep my eye out. I've seen some really interesting data visualization lately, and I'm going to start just dumping emails to you with ideas.

MS. WIEGAND: Please do. I would greatly appreciate it, and I do like the idea of putting together word clouds, or even word trees, as a way to present this information to the council that might resonate a bit more and, for lack of a better term, be more appealing to look at than a swath of long words and summaries on a piece of paper. I really like that idea.

I also think, in terms of quantifying the qualitative, we're going to be able to do that a lot more, particularly for the species where we're able to update these FPRs more regularly, and we're going to start to get a time series of data that I think will lend itself well to sort of more of a content analysis, or a thematic analysis, once we've got more than just sort of one year's sort of information from fishermen, and so that's certainly a long-term goal of mine, is to be able to do sort of more robust social analyses on this information, once we've gotten more of it.

UNIDENTIFIED: I could see almost, if you did sort of this quantitative -- Basically like a word cloud, or something along those lines, or a frequency piece, and you could still have a lot of freedom to do like an illustrative quote, or something like that, that captures the theme, so you see the scale of the theme, but then you're also grabbing the qualitative piece that's illustrative of like this the best quote, I think, for X theme, or something like that. Do you know what I mean?

MS. WIEGAND: Absolutely. I think that would be a great use of this information, and I hadn't thought about it presenting it in that way before, but I think it's a fantastic idea.

DR. SWEENEY-TOOKES: I think that's a great idea, and I wanted to mention too, and I don't know how practical this is for use at the council, but, when we have presented the oral history research that we did, just having short clips of people's actual voices really, really resonated with people who were watching the presentation, even if it's twenty seconds, or thirty seconds, interspersed, and maybe while you're looking at that word cloud, or while they're looking at the numbers, and that does, again, add to the way that it appeals to people, I guess. The responses we received -- Well, you came to one of the presentations, and the responses, you saw, were really beyond that of just reading the qualitative quotes, as we've done in the past.

MS. WIEGAND: That's definitely something we would be able to do easily, and all of these meetings are recorded, and it would be very easy to sort of snip out really powerful quotes that we could then present to the council when sort of going over this information, and that's a great idea, and it definitely humanizes the information that's being presented, which is important.

MR. DIETZ: This is kind of going back to the other conversation, but it's just something that I thought about, but, in terms of talking about past management effectiveness with these types of stakeholders, in terms of things that might be valuable, management isn't just effective because it meets the goals.

Management can be effective because the strategies in place are easy to follow, or easy to enforce, and things of that nature, and so I think, beyond just saying how have management measures affected your ability to access the resource, it might be interesting to see, from a backward-looking frame, is X management measure easier for you to comply with than that one, and which measure do you hear scuttlebutt about, saying, you know, this one is a pain in our ass, and we don't do this one all the time, because it's just too difficult, versus this gear restriction is not a big deal, and they're not that big of a difference, from a stock outcome type of thing, and so I think that might be another layer of questioning that you could add. It's not just how is this affecting biological outcomes, but how are these management measures affecting stakeholder behavior.

MS. WIEGAND: Absolutely. That point is well taken. Thank you.

DR. CROSSON: Christina, we've kind of gone all over the place here, but did we kind of answer a lot of the questions that you had, in a roundabout way?

MS. WIEGAND: Yes. We jumped around a bit, but I feel like I got some good feedback on all of these questions. Thank you. I appreciate it.

UNIDENTIFIED: It's like we're doing one of the surveys, right? We jumped around.

DR. YANDLE: That's just where my brain was going. We just illustrated what Jen was talking about, in that you're not going to go straight from -- We're going to go from A to B to L.

DR. SWEENEY-TOOKES: But which is also where some of the best data comes out, is when you're allowing people to think in that way.

DR. CROSSON: Okay. Let's move on, and so I guess we have some other business to wrap up. I don't see that Chris Dumas was able to get back. John or Christina, do we want to talk about the Vice Chair thing or not?

OTHER BUSINESS

MS. WIEGAND: We certainly can, and so John and I had a discussion, just a couple of days ago, noticing that we don't have a Vice Chair designated for the Socioeconomic Panel, and there are rare occasions where a Chair can't make it, and we have to have the Vice Chair run the meeting, and so we were just discussing whether or not it would be wise to go ahead and nominate and appoint a Vice Chair for the SEP, on the off chance that something happened and, Scott, you're unable to attend a meeting.

We did have some discussion about whether that should person should also be an SSC member, and so I guess that just gives the SEP some background on why this was being brought up. I do note that Chris Dumas isn't on the webinar right now, because he had to go to class, and I wouldn't say this is a pressing need, but I guess, if it's sort of the will of the SEP, if you guys would like to appoint a Vice Chair, as sort of a backup measure, in case the Chair can't make it, that's something that we could do now, under Other Business. John does that capture everything?

MR. HADLEY: Yes, I think so, and just knowing that, if some unforeseen circumstance comes up, where, Scott, you couldn't make it, just having a backup. I mean, the other -- To me, I see three kind of options. We could try to appoint someone now, which would probably the best scenario, but, considering not everyone is currently on, maybe we can't do that, and I will certainly defer to the SEP on that. The other option is just knowing that maybe this is something that we need to take up definitely at the next meeting, and, if anything comes up in between, the worst-case scenario is Christina or I may need to step in and just help run the meeting.

There again, it's a big if, but if a Chair, Scott, weren't available, and so it's just trying to circumvent that circumstance and address it and just see the SEP's preference on that, because we really have operated -- I mean, being a fair small group, and an efficient group, we have operated pretty well with just the Chair so far, and so that doesn't mean that it couldn't go that way moving forward, but we wanted to bring the topic up for the SEP's input.

DR. WHITEHEAD: I think we should appoint a Vice Chair for the SEP, and I don't know if you all have anyone in mind, but it might be useful to have a non-economist as a Vice Chair, if Scott is going to continue as the Chair, and he's an economist. It might, in the future, help with the workload of organizing the meetings and things like that, and it might be more useful than just stepping in if the Chair is not available.

DR. CROSSON: That is certainly a good point, John.

DR. WHITEHEAD: I've made a lot of good points today.

DR. STEMLE: I will second both of those.

DR. CROSSON: Okay. Should we make -- Jennifer, do you want to be Vice Chair?

DR. WHITEHEAD: I nominate Jennifer.

DR. SWEENEY-TOOKES: Do you hear me madly calculating which other non-economists are on the SEP right now?

DR. CROSSON: Well, my understanding -- Tracy, is my understanding correct that this is your farewell?

DR. YANDLE: Yes, that is correct. So that would mean the non-economist is Jen, and so, yes, I'm throwing her under the bus.

DR. CROSSON: I thought I heard somebody yell out her name as a nomination, and I think it was John Whitehead, and so, unless anybody else objects, Jennifer is now the Vice Chair of the SEP.

DR. SWEENEY-TOOKES: Thank you. I feel like I blinked and something just happened there.

DR. CROSSON: Yes, exactly, and thank you, Tracy, because you will be missed. You already are.

DR. WHITEHEAD: What's going on with Tracy?

DR. YANDLE: The short version is I have moved to New Zealand.

DR. WHITEHEAD: Wow. Okay.

DR. YANDLE: So the time zones don't exactly work, and I've got a feeling that the council wouldn't want to pay for my flights.

DR. CROSSON: All right. We have an opportunity for public comment again. Do we have anybody that wants to speak from the public? Do we even have anybody from the public here? I see a former member of the committee, and a former NOAA economist here, but --

MS. WIEGAND: If anyone would like to make public comment, they can go ahead and raise their hand now. I am not seeing any hands pop up, Scott.

DR. CROSSON: Okay. Getting on to the report, I apologize that it's -- Again, it's going to be a tight timeline, but we have the SSC meeting in just a few weeks, and so you all -- I had said Friday, but, really, honestly, if you can get stuff to me by midday on Monday, I would appreciate it, because Monday afternoon is when I'm going to start trying to pull the report together, next week, and so try and get notes down, and especially if you can work with anybody else that I assigned that section and try and get something cohesive to me, bullet points or narrative or whatever it is.

Then I will try and incorporate those in as quickly as I can next week, and I've got a bunch of things going on next week, but I will try and get those back to you all as a report, as a draft of the report, but the end of the week, and then hopefully we'll get it approved quickly, so we can get it in the briefing book, because the briefing book has already been posted for the SSC, and so this is going to be a late addition, and we need to get it cranked out.

Otherwise, hopefully next year we'll be in-person, and hopefully everybody is getting their immunizations and this whole thing will end by a year from now, and we can go out and have a nice dinner in Charleston, like we normally do. Any other comments from people before we wrap it up?

DR. SWEENEY-TOOKES: I'm looking forward to being back in person next year.

DR. CROSSON: Good. Thanks, everybody. It's always a great meeting, and I always enjoy the SEP.

MR. HADLEY: Scott, if I could, it being Tracy's last meeting, I just wanted to give a shoutout to Tracy, and I know many people feel this way, but thank you for all your input over the years, and we'll miss having you on here.

MS. WIEGAND: I just wanted to say thanks to everyone for attending yet another webinar meeting, and I know these are getting a little -- Here's hoping that we'll be back in person next April, and, like everyone has already said, Tracy, your input as a social scientist on the SEP has been invaluable, and we are definitely going to miss having you at all of these meetings, and you can look forward to all of us visiting you in New Zealand soon, I hope.

DR. YANDLE: Thank you. I am really going to miss working with you guys, and we're definitely going to have a spare bedroom.

DR. CROSSON: Okay. With that, I call this meeting adjourned.

(Whereupon, the meeting adjourned on April 13, 2021.)

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Transcribed By
Amanda Thomas
June 21, 2021

Attendee Report: Socio-Economic Panel of the Council's Scientific & Statistical Committee

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Attendee Details

Attended	Last Name	First Name
Yes	BYRD	01JULIA
Yes	Bell	00Mel
Yes	Brouwer	01Myra
Yes	Carmichael	01John
Yes	Chaya	Cindy
Yes	DeVictor	Rick
Yes	Dietz	David
Yes	Dumas	Christopher
Yes	Gervasi	Carissa
Yes	Hadley	John
Yes	Helies	Frank
Yes	Iberle	01Allie
Yes	Jepson	Michael
Yes	Karnauskas	Mandy
Yes	Mastitski	Anthony
Yes	Mastitski	Anthony
Yes	McPherson	Matthew
Yes	Mehta	Nikhil
Yes	Murray	Jason
Yes	Nesslage	Genny
Yes	Peterson	Cassidy
Yes	Poland	00Steve
Yes	Rhodes	01Cameron
Yes	Ropicki	Andrew
Yes	Santos	Rolando
Yes	Schmidtke	01Michael
Yes	Schnier	Kurt
Yes	Scott	Tara
Yes	Stemle	Adam

Yes	Sweeney Tookes	Jennifer
Yes	Sweetman	CJ
Yes	Travis	Michael
Yes	Waters	James
Yes	Whitehead	John
Yes	Yandle	Tracy
Yes	blake	suzana
Yes	collier	chip
Yes	crosson	scott