

SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL
SOCIO-ECONOMIC PANEL OF THE SCIENTIFIC AND STATISTICAL
COMMITTEE

Webinar

April 8-9, 2020

SUMMARY MINUTES

COMMITTEE MEMBERS

Dr. Scott Crosson, Chair
Dr. Jim Waters
Dr. John Whitehead
Dr. Tracy Yandle

Dr. Jennifer Sweeney-Tookes
Dr. Christopher Dumas
Dr. Jason Murray

COUNCIL MEMBERS

Steve Poland

COUNCIL STAFF

Myra Brouwer
John Hadley
Christina Wiegand
Kim Iverson

Dr. Brian Chevront
Cameron Rhodes
Dr. Chip Collier

Other observers and participants attached.

The Socio-Economic Panel of the Scientific and Statistical Committee of the South Atlantic Fishery Management Council convened via webinar on April 8, 2019, and was called to order by Chairman Scott Crosson.

INTRODUCTION

DR. CROSSON: We are going to start this meeting. My name is Scott Crosson, and I'm from the NOAA Fisheries Southeast Fisheries Science Center, and I'm the Chair of the South Atlantic Council's Socioeconomic Sub-Panel, and we're going to start right now, and I guess we'll just go through -- There is nobody to my right, and so I'm going to say that we'll start with Tracy and go that way.

DR. YANDLE: Tracy Yandle, Emory University.

DR. WHITEHEAD: John Whitehead, Appalachian State University.

DR. WATERS: Jim Waters, Morehead City, retired.

DR. DUMAS: Chris Dumas, University of North Carolina Wilmington.

DR. JASON MURRAY: Jason Murray, NOAA's Office of Response and Restoration.

DR. SWEENEY-TOOKES: Jennifer Sweeney-Tookes, Georgia Southern University.

DR. CROSSON: Is that it? Is there anybody else that we're missing?

MR. HADLEY: I think that's all the SEP members.

DR. CROSSON: All right. I think that's accurate as well. So we're starting this meeting, and so the first thing to notify you guys is if you approve the agenda as it states right now. We tried to limit it down a little bit, since the original in-person meeting was postponed, but, if you guys have any objections to anything, please let us know. We're going to try and go through the items today up through Item -- I believe Number 5 is allocation, and we're going to try to save allocation for tomorrow morning, so that everybody is fresh to go with it. Does anybody have any other issues or are we ready to approve the agenda as it stands? Hearing no objection, I am ready to say that the agenda is approved.

Now how about the -- I'm sure you all have perused the April 2019 minutes, and does anybody have any edits to make to those? Okay. We've already introduced ourselves, and, other people that will be presenting, I'm sure they will introduce themselves when they do that. I guess, at this point, I don't know if there's anybody online that wants to do public comment. Christina or John, do you see anyone out there?

MS. WIEGAND: If you would like to make a public comment, if you can use the little raise-hands button on your webinar, and you should see it on the right-hand side of your screen. If you click that, then we'll know that you want to make a public comment, and we can unmute you. Going once, going twice. I am not seeing any hands raised right now.

DR. CROSSON: Okay. At that point, I'm going to close the opportunity for public comment, and we'll move on to Item Number 2, which is John Hadley going over recent and developing council actions.

RECENT AND DEVELOPING COUNCIL ACTIONS

MR. HADLEY: Before I jump into that, I just want to give a quick overview of the kind of rules of the road for the webinar. We're going to -- We have unmuted everyone, or we should have everyone unmuted, and so you're self-muting, muting and unmuting yourself, and, there again, we're monitoring the questions. If you have any issues, write a question box, and one of us will get to you, and, also, you can always raise your hand, your digital hand, and we'll try to address that as soon as possible. Just because we have, potentially, several live mics, if you wouldn't mind muting yourself when you're not speaking.

One other thing is I just wanted to -- Scott and I, and Christina, had spoken about, under Other Business, we were going to discuss some of the potential ways to address the economic and social impacts of COVID-19 on the fishing community, and so I just wanted to mention that, for those that are tuning in tomorrow.

With that, I will jump into the second agenda item, which is Recent and Developing Council Actions. There is an attachment for this document that kind of has the full list of the recent developing council amendments. I am going to stick to the overview and the amendments that were mentioned in the overview, since these were really the ones that had a strong social or economic driver behind them, and I will go over them very briefly.

To start off with, we had our two visioning blueprint amendments, one for the recreational sector, which is Amendment 26, and the other for the commercial sector, which is Amendment 27. For the Amendment 26, focusing on the recreational sector, this amendment went into place just a few -- It became effective, regulatory-wise, a few days ago, and there were several actions in this amendment that came out of the vision blueprint process, and there were a few actions in there looking at reducing discards, and so remove size limits for some of our deep-water snapper species.

Then, also, reduce the size limit for gray triggerfish off of Florida, which brings some regulatory consistency throughout the South Atlantic region for the recreational size limit for gray triggerfish, and so it's the same from North Carolina through Florida now. Additionally, within the twenty-fish aggregate, there was a stipulation put in there that twenty-fish aggregate still stands. However, no more than ten can be the same species, and so those are the general changes made in Amendment 26.

Moving over to Vision Blueprint Amendment 27, there are several actions in here that focus on adjusting commercial split seasons, or commercial trip limits, looking at two different purposes. One is sort of stretching out the season, so to speak, and also making sure that different constituents have access, or at least some access to the commercial quotas throughout the range, and so making sure fishermen all the way up -- Trying to make sure fishermen all the way up in the Outer Banks have a shot at many of these snapper grouper species as well as the fishermen all the way on the other end of the spectrum down in south Florida, since you have different ways that those fisheries

function by season. Initially, they were the same size limit, and removing the size limits for some of the deepwater snapper species and reducing the gray triggerfish size limit to twelve inches off of Florida, to be consistent with the rest of the South Atlantic region.

Also, there was an implementation of a size limit for almaco jacks, and this was -- The idea here was that the larger jacks get a better price per pound and have a better yield, and so, if there was a size limit put on them, then the idea is you could get kind of more bang for your buck out of the resource from a commercial perspective there, and so that was another component of the Vision Blueprint Amendment 27. I will pause there, if you have any questions on those, before I jump into Amendment 29.

Moving along, and we'll get into this a little bit later in the agenda, when we talk about best fishing practices and persuasion, but I just wanted to give a brief overview of Regulatory Amendment 29, and, really, this has been an amendment that the council has been considering since 2018. Originally, it was sort of an overarching view of implementing best practices as well as looking at recreational permitting and reporting. Since that latter component, recreational permitting and reporting, likely would take a significant amount of time to develop, the council wanted to move forward with the best fishing practices component, and so we split this off into its own amendment, which became Regulatory Amendment 29.

Also, a part of this involves some changes to powerhead regulations, which focuses off of South Carolina. Currently, there's a powerhead prohibition. With the idea that removing this prohibition would bring the EEZ off of South Carolina consistent with the South Atlantic region's EEZ in North Carolina, Georgia, and Florida, where powerheads are allowed.

Focusing on the best fishing practices component of that, the council developed options that addressed venting and descending devices. The use of circle hooks and the allowable rigs portion was dropped, but the council moved forward, and this amendment ends up requiring a descending device to be onboard fishing vessels that are fishing for or possessing snapper grouper species, and this applies to both the commercial and recreational sector, and it does not necessarily mandate their use, but it mandates that the device must at least be onboard.

Also, it requires vessels fishing for snapper grouper species to use non-offset circle hooks north of 28 degrees North latitude, and so essentially south Florida north, and circle hooks are mandatory in the snapper grouper fishery, and, there again, it allows the use of powerheads to harvest snapper grouper species in the federal waters off of South Carolina, bringing regulatory consistency throughout the South Atlantic region. We'll get into that a little bit more later on in the agenda, but I'm happy to answer any questions right now on Amendment 29.

Moving along, Dolphin Wahoo Amendment 10, you may recall hearing about this amendment at previous meetings, and it really has -- This amendment is ongoing, and it started out looking at potential ways to allocate or share quota between the commercial and recreational sectors for dolphin, but it really has evolved into more of an overview, and potentially an overhaul, of the dolphin wahoo fishery itself, with several different actions.

However, I bring this up because the council is looking at revised ACLs for dolphin and wahoo that really take into account the revisions to MRIP, and so the recreational data that is available, and, really, there's been a large, overarching increase in the recreational landings estimates, and

so, since the ABCs, the catch level recommendations, for dolphin and wahoo are based on landings, this greatly affects the ABC for dolphin, and likely the ACL and looking at ways to accommodate this new data for the recreational sector.

The amendment would revise the ACLs for dolphin and wahoo, and, to go along with that, it will revise sector allocations for dolphin and wahoo, and so the discussion on allocations that will take place tomorrow, among other things, it will certainly -- The council will be looking at your advice and your recommendations when they next look at Dolphin Wahoo Amendment 10, which is scheduled for June.

Additional actions in the amendment are revising the definition of optimum yield in the dolphin fishery, revising accountability measures, allowing possession of dolphin and wahoo when unauthorized gears are onboard, and that's usually looking at a combination for say if a vessel has a lobster pot onboard, making some special circumstances where they could also possess dolphin and wahoo.

Removing the operator card requirement, potentially modifying the recreational limit for dolphin, modifying gear, bait, and training requirements in the longline fishery to align with those of HMS, and so bringing some parity between the dolphin wahoo fishery and the HMS fisheries that are fishing pelagic longline gear and allowing filleting of dolphin at-sea onboard for-hire vessels in the waters north of the Virginia/North Carolina border, and this is really in response to a request from the Mid-Atlantic Council. They requested that the South Atlantic Council consider this in the Dolphin Wahoo FMP.

The council will be reviewing revised ABC recommendations from the SSC, which the SSC will be discussing at their meeting in a few weeks, and the council will be reviewing these recommendations at their June 2020 meeting, and, really, they will provide guidance on how they want to further develop Amendment 10.

Then, last but not least, we have Framework Amendment 8, which adjusted king mackerel trip limits during Season 2, and this is in the southern region, and so, really, you're looking at the middle to south Florida area. Fishermen expressed that they only had a limited number of days to fish during this time of year. Additionally, due to changes in the fishery, there were more fish available on the market, which resulted in lowering prices, and so members felt, when they were able to make it out there, during these weather windows, it would be helpful to have a higher trip limit, to really make these trips worthwhile from a revenue standpoint, and so the council went forward with Framework Amendment 8 to immediately address the fishermen's request.

There was an emergency action put in place that raised the Season 2 trip limit south of the Flagler/Volusia County line from fifty fish to seventy-five fish, and then the amendment itself was intended to make a permanent change to the Season 2 trip limit, and, in the amendment, the council chose to select a 100-fish trip limit during Season 2 as their preferred alternative, and this amendment is in the process of going into place, but it should go -- The regulatory changes should go in place fairly soon, and that's all. Those are the major highlights, and I will stop for any questions there.

DR. CROSSON: Any questions?

MR. HADLEY: If not, that's okay. Like I said, we'll certainly jump into some of these amendments later on, specifically the best fishing practices, and, there again, the discussion on allocation will certainly apply to Dolphin Wahoo 10 as well as the council's subsequent discussions on allocations. They will be looking at really revising the allocations for all of the unassessed species, which includes many snapper grouper species as well, and that discussion will intersect with the management and what the council will be facing in the near future.

DR. CROSSON: Thanks, John. I guess we're ready to move on, and I assume Julia is going to do the walk-through for Number 3?

CITIZEN SCIENCE UPDATE AND FISHSTORY WALK-THROUGH

MS. BYRD: Yes, that's the plan. Everyone, I'm Julia Byrd, and I am the council's Citizen Science Program Manager, and so I'm going to give a quick overview of what's been happening in the Citizen Science Program over the past year, since your spring meeting in 2019, and then I'm going to turn things over to Allie Iberle, who is the project coordinator for one of the Citizen Science Program's pilot projects, FISHstory, and she's going to walk you through a demo of that project and an online crowdsourcing platform called Zooniverse, and then we're hoping to get some feedback from you guys on that project, but, first, I just wanted to give kind of a quick overview of what's been happening in the program.

First, I wanted to tell you a little bit about some of our programmatic activities that have been going on over the past year. We're working on an overall Citizen Science Program evaluation, and we've been working on that with Rick Bonney and Jennifer Shirk, who are kind of our citizen science gurus that have been working with us since we started to develop the program back in 2016, and so we've been working with them and members of our Citizen Science Operations Committee, which is one of our citizen science advisory panels, to come up with kind of draft objective strategies and indicators that will go to the council for their review in June, and then we'll be working on putting together an overall evaluation plan, once we have those things nailed down and kind of adopted by the council.

We have also had several webinar meetings, and we have two primary citizen science kind of advisory panels, and one is this Operations Committee, and that group is responsible for kind of policies and overall procedures for the program, and they have met a number of times via webinar over the past year, and then we also newly formed the Citizen Science Projects Advisory Committee, and so that is a committee that is made up of representatives from most of the council's advisory panels, and so primarily a group of fishermen, and so we formed that group, and they met for the first time last October.

We have done a number of presentations for various APs, both at their spring and fall meetings last year, but we also did three additional presentations that I just quickly wanted to mention. One was presented information on the Citizen Science Program at the May Council Coordinating Committee meeting that was here in Charleston, and it was part of a larger presentation that highlighted some of the council's efforts and projects that they were working on, and so that was a good opportunity to share information on our Citizen Science Program and other work that the South Atlantic Council is doing with the broader group of councils across the country.

Also, in June of last year, we presented and served on a panel for a meeting of the federal community of crowdsourcing and citizen science, and they had a meeting that was focused on how citizen science impacts policy and decision-making, and so we presented on kind of the development of our program, and then Allie Iberle presented at the South Carolina Marine Educators Association Conference last fall on the FISHstory project that she will be going over with you guys in just a few minutes.

We have also been working on a manuscript that was submitted to Bioscience, and Rick Bonney has been leading the charge on this effort, and it focuses on kind of citizen science in the marine world, and marine fisheries in particular, and development of the council's program, and so that was submitted, and we're working on revisions to that manuscript this year.

We also updated the citizen science research priorities, and this is done every two years, and it's really what drives the projects that the program pursues or supports, and so I have a slide that briefly summarizes this that I will show you in just a minute, but we kind of updated those last year, following a process that's laid out, and so both of our advisory panels kind of provide information, and then that information gets reviewed by the council.

Then we have also been working on organizing a symposium for the American Fisheries Society Meeting this year, if it's still going to go on, depending on what happens with COVID-19, but it's a symposium that we're working on with folks from NOAA, from the Science and Technology Office, and it is kind of focusing on how citizen science and other kind of non-traditional data sources can be better incorporated into fisheries management and fisheries stock assessments.

We have also done a number of things, as far as kind of program promotion and outreach, and the council's booth at ICAST, which is a large recreational trade show, kind of focused on citizen science last July, and then we participated in Georgia CoastFest and then the North Carolina Fishing Industry Summit in the fall of last year, and then staff have been working to develop some program outreach as well.

We developed a citizen science brochure, and Cameron Rhodes really led the way doing that, and we have a citizen science corner in the quarterly council newsletters. If any of you guys follow us on social media, Cameron also started something called Cit Sci Fri, and so it shares information on citizen science kind of opportunities and information on our projects and program every Friday, and we're also putting together an email distribution list, and we'll be putting together an annual report that should go out by the end of this month, and we're also -- April is Citizen Science Month, and so, this month, we're doing extra posts through our social media, kind of highlighting some of the volunteers on our projects and some other kind of things that are going on within the program and then within the larger citizen science community.

This is a quick summary of the citizen science research priorities. Again, I just wanted to kind of show these to you guys, and they are what drive the projects that the program kind of pursues and supports, and so I just wanted to show these to you guys quickly and make a plug that we're always kind of looking for partners and collaborators, and so, if you know anyone who is interested in working on any of these topics, using a citizen science approach, we would love to chat with you more.

That's just a quick overview of programmatic-level activities, and then I also want us to talk a little bit about some projects and collaborations that we have underway and that are under development, just to let you know kind of what kind of projects we have been pursuing over the past year.

First, I wanted to talk about kind of projects and collaborations that are kind of under development or kind of recently got underway, and the first one is a project that was looking at rare species observations, and we were partnering with a scientist, professor, at UNC, folks within NOAA Fisheries, SECOORA, and then the University of Tasmania, and the idea here is we wanted to make kind of an app or a website where people who are on the water, whether they be divers, fishermen, other folks out on the water, would be able to report observations of rare species, and so the idea is that maybe getting those observations could be an early warning signal for species shifting.

We have put together a prospectus and that was shared and submitted to Lenfest earlier this year, and we recently found out that we're not getting funding, and so we're looking at other avenues to pursue funding for this project.

Another project that we've been working on, and Chip Collier has really taken the lead in this one, is a project that's working with REEF and SECOORA to collect information from data-limited species by kind of partnering and collaborating with recreational divers, and so the idea here is that divers would try to collect kind of length information and size information from some data-limited species down in the Florida Keys, as a pilot project, and the project would focus on kind of groupers, parrotfish, and hogfish, with the idea that some of that length information could be really helpful to provide information on population in between stock assessments, and so that proposal was submitted to the Coral Reef Conservation Program earlier this year, and we're waiting to hear back about that.

Then a third kind of collaboration under development is something that we've been working on with the Southeast Fisheries Science Center, and it's a series of dolphin wahoo participatory workshops, and so these efforts are being led by Mandy Karnauskas and Matt McPherson at the Science Center. In 2019, they did a series of workshops in the Gulf on the West Florida Shelf that focused on the snapper grouper fishery, and so the idea was to kind of bring fishermen together to get their input and to put together a conceptual model of the fishery, and so to capture kind of what are the major factors that affect the fishery, what do people value in the fishery, what risk do people see in the fishery, and to develop that into kind of an overall conceptual model.

They were interested in bringing that kind of series of workshops over to the South Atlantic, and so they contacted us, and we kind of had worked with them and decided that it would be really helpful to focus on the dolphin wahoo fishery for the workshops in the South Atlantic, and what we've been hearing from fishermen is that there are kind of very different perceptions of the fishery in the Florida Keys versus kind of the Carolinas and Virginia area, and, as John mentioned a few minutes ago, the council has been thinking about taking some management actions on the dolphin wahoo fishery, and so we thought this would be a really wonderful opportunity to kind of get these conceptual models together that could be shared with the council and could hopefully kind of pick out some of the differences seen between the North Carolina/Virginia fishery and the Florida Keys/south Florida fishery.

The first series of workshops was held in North Carolina and Virginia in March. earlier this year, and Scott Crosson was one of the participants who came to the workshops as well, and so we are planning to hold a series of workshops down in the Florida Keys this summer, and so that planning is a little bit on hold with the COVID-19 situation, but we're hoping to get those planned, and so then the folks from the Science Center would be able to present that information to the council and to the SSC later this fall, fall and winter.

That's kind of projects that are under development, or just getting underway, and then I wanted to quickly highlight a couple of the projects that have been underway for a while, and the first one is the SAFMC Scamp Release Project, and this was the first citizen science project that the council launched, and, for this project, we worked with scientists and fishermen to develop an app called SAFMC Release, to collect information on released fish, or discards.

We are piloting this to collect information on scamp grouper, and so the app was developed and pilot tested and beta tested with fishermen and some of our Citizen Science Action Team members, and it launched officially last June. We are currently working on recruiting and retaining commercial, for-hire, and recreational fishermen, and so a few kind of upcoming things for this project is we have received, or will be receiving, a grant from ACCSP in the upcoming months that we partnered with North Carolina DMF on that will allow us to expand this app to collect information on all shallow-water grouper, and not just scamp grouper, and this proposal will also allow us to kind of expand the app.

North Carolina DMF was interested in our SAFMC Release app, and so they kind of adapted it to -- This is underway now, but they're adapting it to develop their own app to collect information on recreationally-released flounder called Catch You Later, and so this grant will basically kind of merge these two release apps together into one kind of flexible reporting tool for released fish that can be customized by different state or federal agencies, and so that will happen over the next year, and we're hoping, by the end of 2020, we'll be able to expand the Release app to collect information on all shallow-water grouper.

We also have put in a proposal to do a series of kind of -- We're calling it a series of media tours to help promote the app, and it's basically -- We have put in a grant to charter trips that we would take outdoor writers on, where we would be able to kind of target scamp grouper and then show the writers how to use the app and why it's important and talk a little bit about best fishing practices and then encourage them to write stories or share information about the app itself. We will be submitting data for review at the scamp data workshop that is being done by webinar now, and then we're also going to be working with a College of Charleston graduate student to kind of review user perceptions of the app.

One other project that I wanted to highlight that's underway now, and we're a collaborator on this project that's being led by the Nature Conservancy, and it works with folks at Gray's Reef National Marine Sanctuary, Georgia Sea Grant, Georgia DNR, and the National Marine Sanctuary Foundation, which is actually funding this project.

The project is focusing on increasing awareness of Gray's Reef among recreational anglers and then encouraging the use of best fishing practices for deepwater species, in particular the use of descending devices, and then promoting collaboration through different citizen science projects, kind of highlighting some of the voluntary data collection efforts that the council is doing, and so

a series of focus groups was held last spring, and the plan this spring was to do a series of what we're calling fishing learning exchanges, where we would kind of hold events where fishermen would come, and we would have discussions with them about kind of Gray's Reef, talk a little bit about best fishing practices, and do some training on how to use descending devices and share information on some of the apps that the council has to collect information on captive and released fish.

That has kind of been put on hold a little bit. We held a couple of workshops in Brunswick in March, and then we're kind of waiting to see and reschedule a number of other workshops that will take place in different places in Georgia that have been postponed due to the COVID situation and will be rescheduled once things sort of get back to normal, I suppose.

Then the last project that I wanted to talk about is what we really wanted to dig into a little bit more and get you all's feedback on, is a project called FISHstory, and I think John Carmichael might have given you guys kind of an update at this project at your meeting last spring, but this project is using kind of historic photos to try to document for-hire catch and length estimates back in the 1940s to 1970s, and so that's before there were dedicated catch monitoring programs in place for the for-hire fisheries, and so we're hoping that kind of data collected through this program can kind of help fill that data gap.

Since your last meeting, and I mentioned this briefly at the beginning, but we've hired a project coordinator, Allie Iberle, for this project, and so we're really excited to get her onboard, and she's done a wonderful job and is kind of leading the charge for this project. We have also put our project design team together, and so it's a group of kind of folks with different backgrounds. We have some scientists, some fishermen, social scientists, kind of outreach and communication folks, and this group provides guidance for the development of this project, and I know Tracy Yandle has kind of provided input through the project design team for us, and so we're very thankful for that.

This project has kind of two primary components. One is we're trying to get information on for-hire captains kind of species composition, what was being caught back in the 1940s to 1970s, and, to do this, we're using an online crowdsourcing platform called Zooniverse that allows you to kind of like upload your photos, develop tutorials and training materials, so that citizen scientists will be able to help us kind of ID and count the fish in the photos, and Allie has really built the project in Zooniverse, and she'll be walking through that with you guys in just a minute.

As part of this project, we've also put together a validation team, and so that's a group of scientists and fishermen that will help verify the species IDs made by citizen scientists in these photos, and so the validation team has been formed, and we've held a number of kind of training webinars to get those guys up to speed on how we want them to kind of verify the information in the photos, and so, right now, we have submitted the project for beta testing in Zooniverse, and so they have basically sent the project out to their gold-star volunteers, and so we're collecting data and feedback from those gold-star volunteers now.

For the second piece of the project, we're trying to get information on the size of fish in these photos, and so we are trying to develop a methodology to do this that's based on using kind of the lumber in the back of the photos, those two-by-fours or two-by-sixes, to scale, so we can estimate the length of the fish in the photos, and so we're developing the methodology now, and we'll be

pilot testing it on king mackerel, and then, if it works well, we're hoping to expand it to more species in the future.

That's just a quick overview on the project, and now I was going to hand it over to Allie, and she's going to actually pull up the project in Zooniverse and walk you guys kind of through it, and then we're hoping to get some specific feedback from you guys on the project itself.

MS. IBERLE: Like Julia said, I'm Allie Iberle, and I'm the project coordinator for the council's FISHstory project, and so the reason that we turned to Zooniverse was we have a pretty large bank of photos, around 1,300 photos, and so we really wanted to turn to citizen science to help us extract all of this valuable data from the photos, and so this is the main page that you will see when you log into the FISHstory project, and it's kind of where we want to hook the Zooniverse user, or anybody who we have directed to this project.

It includes a brief description on what they're going to be doing, and you get to see a little bit of a snapshot of the photos, some specs on what's happening in the project, and Rusty Hudson is a retired recreational and commercial captain out of Daytona, and he's the one that provided the photos, and he also provided this really nice quote here. Again, it's just a hook to get people interested in the project, pull people in, and get them to start classifying photos.

To give people a little bit more background, we created the About page, and the About page just includes kind of an overview of what we're trying to get from the project, the data that we want to collect, why this data is important, but then we go into a little bit of how the project got started, what specifically they're going to be looking at, kind of explaining these photos, for any non-fish expert. You are seeing people and fish, but there's a lot more behind those photos.

We let them know about that validation process that Julia mentioned and then a little bit about the council and the council's Citizen Science Program, but there's a lot behind these photos, where they were taken and the people in the photos. They are really a bank of history in Rusty's family, and so we go into a lot of that detail here in the about section, and I think that that will provide some really good options for educational opportunities, and so taking this into classrooms and having people really dig into the background behind the project, and so we have everything about the location that the photos were taken in and then where they were fishing and then the captains themselves, and so going through and looking at -- This is Rusty here, the one that provided the photos.

Then it's looking at all of his family that were captaining these vessels and which vessels they were on, and he even provided us with newspaper articles from the time that described these captains in a little bit more detail, and we felt as though we couldn't put together a better bio for these people than we had already been provided, and so we included those newspaper articles, and we go through the three main captains one-by-one with each of their newspaper articles and their vessels.

Then, if you go back up to the top, the Classify tab is really where we're gathering the data, and so this Classify tab includes our work flow, or tasks, and here is where they will be presented with a photo, and they have the opportunity to classify that photo and all the fish inside of it, and so, first, they will be introduced with a tutorial, and this is the first step, that kind of first introduction to training materials that we provide them, and this is kind of a general how to go through the

project, and it walks them through how to use Zooniverse, and then it explains the two different sections that we have in the workflow, and I will go through those more in a little bit, and I don't want to read this verbatim.

We have split the species of fish into two groups, the most common species, which is ones we see all the time in the photos in the largest quantities, and then the less common species. There is a lot of obstructed fish, and we want the users to mark this, so that, if we are finding a lot of obstructions, or we think that these obstructions could be identified, we can kind of go in on the backend and look at this data.

Then we also have the users count anglers, and we were doing this because we want to gather a rough catch per unit effort. Each photo represents one trip, and so we have no way of knowing if everyone in the photo is fishing, and so we're going to assume that everyone was, and that's how we're going to calculate that, is by having them count. Then we have that group of less-common species.

We give them more of a description and some more photos of these species, and these are just seen less often, and we have bins that you don't have to count them to an exact number, and so kind of the stress is a little bit relieved on this portion of the workflow, and then, finally, we kind of gear them towards the field guide over here, and I will go through that in just a moment, which is where the bulk of the training materials lie. We give them a lot of descriptions and comparison photos in this portion of the project, to really help educate themselves on fish identification, because this can be very tricky at times.

The first portion of the workflow is using kind of a point-and-shoot mark tool, and so, once you click on the species that you're ready to identify, you just mark on the photo where that species occurs. It's really easy, and so it's easy to keep track of where you are in the photo, and, when we collect the data, we're given a coordinate on the picture, so we can go back and reference exactly where each user said that they identified each species of fish.

After you do that, then you can click on the photo, where you find any obstructed fish and anglers, and, again, there's a lot of anglers in the photos, and so we really want to make sure that we give them that point-and-shoot tool, to help keep track of all the people, because, when you're counting and you can't mark, it can be pretty tricky.

After they have completed that task -- I wanted to go over grouper, too. When you identify a species as a grouper, and I'm just going to click anywhere, the user is given the opportunity to identify the grouper down to three species that we have identified as the most common. We see some other species, but we try to narrow it down, to make it as easy as possible, and so they're given the chance to identify to gag, red, or scamp/yellowmouth. I will just tell you that is an identification that can be tricky in full color, and so we're not having them try to identify that to the species level.

Then, once the user advances, they are given this list of species that we see less common, and that includes different types of snappers, like vermilion and gray, other types of jacks, the shark species, which we included, because we figured that it would be satisfying for the user to be able to identify these large sharks, and then some various other species.

Within this section of the workflow, we also give them shape and tail characteristics that they can narrow down the species, and so, if you click on the shark shape, you are only shown choices with that body shape, and then the same with the tail, and so we have narrowly-forked tail, and all of the species that have that narrow-forked tail are shown here, and so pretty much just more tools and tricks to help ease the difficulty on the user.

Then I wanted to go through the field guide really quickly, and so the field guide, again, is that kind of the bulk of the training materials lie in this portion of the project. We start off with a little bit of an overview welcome to the field guide, and we go over some basic terms. Again, we're kind of catering to a different audience here, and we use terms like "caudle fin" and "dorsal fin", and, while we understand these terms, the users in Zooniverse may not, and so we included that, some diagrams about the compression of the body shape, and then discoloration. We're looking at black-and-white photos, and these fish sat on ice for long periods of time when the boat was coming back in from the fishing location, and so knowing that kind of helps you when you're making your identifications.

Then, for those people who are a little bit more familiar with fishing, directing them to look at the date of the photo, and they may have some knowledge of seasonality, and so that may be helpful, and then the rest of the tabs are kind of descriptive tabs that go over each species and how to either identify or eliminate the species, and so we give them a full description that they can reference when they are using that red snapper tool, and then some comparisons between different snappers that they're going to see in the photos, and so I don't want to go through this word-by-word, or each tab, but we really tried to make it easy, because some of these identifications can be quite difficult.

Then, in the less common species, it's essentially the same thing, except for we have all of the species in one tab, and we have comparison photos, things to look for, and example of the fish within the photo set. We included those illustrations of each fish. However, seeing them in the photoset we felt was really important, for people to be able to compare.

Then another aspect of the project that we really liked was the Talk Section and the Collect Section, and so the Talk allows the Zooniverse users to be in communication with us and ask questions, and we can pose questions to them as well, and they can pull pictures straight from that task that I was just in and build collections and kind of really make this process interactive, where they are really interacting with us, and it's not just them collecting all the data and never getting in touch, and so that's pretty much it for FISHstory, for the project, and I guess I will open it up for any questions here. Julia, I don't know if you had anything else.

MS. BYRD: No, Allie, and I think that's great. We would be interested to get any feedback that you guys have on the project, and I think we put some specific discussion questions kind of in the overview document, but we would really be interested in getting kind of any feedback from you guys, in particular if you think there are any additional data fields that could be collected from these photos that could be helpful for management, and that would be something that we would really love to get some feedback from you guys on.

DR. DUMAS: Is vessel name one of the data fields you are collecting?

MS. IBERLE: It is currently not one of the fields we're collecting. When Rusty so graciously scanned all the photos, he provided the vessel name in the naming convention for the photo, and most photos, if you can see here, they have this sign which identifies usually the date as well, but the vessel and the captain, and so we're not collecting that as of yet, since we have it.

MS. BYRD: One thing that I will add, Allie, is that, when we first got these photos, Allie made a photo catalog, and that information has the date, the captain, the boats. All of that information is already captured, and so the idea is that, instead of making the folks in Zooniverse enter that information, we already have it electronically, and so we'll be matching that up to kind of the fish counts and IDs from these photos, and so that sort of information is already electronic that Allie has painstakingly entered, and so it is included in that file.

MS. IBERLE: I don't know how I forgot that.

DR. DUMAS: I am looking forward to -- Do you guys want people to submit a lot more photos and then also have the citizen science people not only identify fish, but also put in the vessel name, the captain name, the date, off those little signs, so that you guys don't have to do it, or you guys could at least go by and verify it, and that's one.

Two, are you guys looking for the public to submit photos, more photos, and that's number two, and number three is it seems like this would be a great class project, or a lab project, for any kind of fisheries science class or fishery management or fishery economics class, to have one of the labs for that class be to go to this and then work on some of these photos. That could be a way to recruit a lot of people fast to help identify. Thanks.

MS. BYRD: Chris, thanks for all that feedback. I guess, to answer some of your questions, and, Allie, feel free to jump in, but, as far as looking for other photos, I know one thing that we are interested in, and Allie has kind of done this demonstration for kind of the Mackerel Cobia AP and the Snapper Grouper AP, and one thing that some of those members have shared with us is that they know folks who have kind of a series of photos like this, folks who have been in the for-hire business for a long period of time.

I think there are probably a lot of pockets of photos like this in many different places throughout the region, and so I think, right now, we're doing this as a pilot project, and so we aren't actively collecting photos now, but we are making a list of folks names that, if kind of this project is successful, and then we would need to acquire some additional funding, that we could then reach out to folks to kind of collect additional photosets that we could introduce into this project, and so, again if you all have suggestions of people who may be good to reach out to in the future, when we get to that point, that would be awesome.

I think, right now, as far as having folks enter the boat name and the date, since Allie has done a lot of hard work, and she has done that for the photoset that we do have now, but, moving on in the future, I think that's a great idea, to have kind of some of that work be done by some of the citizen scientists, and, also, to your third point, I think it's really wonderful that you suggested kind of a class project for any kind of fisheries science or management-related kind of labs or classrooms.

We kind of have thought that that would be a great audience as well, and so I know Allie has put together kind of a communications plan on kind of ways that we can reach out to those groups, but, if you guys have any kind of specific suggestions on how to reach out to those groups, or if you know certain kind of universities or professors that may be interested, we would love to have that information.

DR. SWEENEY-TOOKES: I just have to say, first of all, that I'm really impressed with what you have accomplished in the last year. We were really excited to see this a year ago, as John was just talking about just the idea of what it would be, and so, seeing this beta version, I am very impressed with what you have accomplished in a year. That's first.

Secondly, I wanted to add on to what Chris was saying about this collaboration, and I wanted to, of course, give you more to think about and make it even bigger, which is you might want to look at some of the work that NOAA has done with their oral history projects. This type of outreach and working within school systems, even with middle schoolers and high schoolers, is something that they've established and been doing for a while, and so, if the beta goes well, and you want to grow this much larger, doing some sorts of oral histories along with gathering of the photos might be an avenue to go with, and they might have some infrastructure or some ideas for you about how to structure that.

MS. IBERLE: That sounds awesome, and thank you for your comments on the project. I think the oral history would really be a great accompaniment to this project, with looking at the photos.

DR. SWEENEY-TOOKES: I think you might find that there is people that are trained in doing that, and I know the person that I work with at Georgia Sea Grant who was trained in oral history came from Florida Sea Grant, and I know Christina Package-Ward is down in Florida, and she is not -- I don't think she's with Scott in Miami, right, and I think she's in -- Scott, where is she at?

DR. CROSSON: She's at the Regional Office in St. Petersburg.

DR. SWEENEY-TOOKES: Yes, and so she's had a lot of experience with oral histories and uploading them to the NOAA site and that collection, but you might also find what we found with the project that we did in Georgia, which is, at first, people don't want to share those photos, but, once they start talking with you and doing these oral histories, then, suddenly, photos are appearing in places where we were told there were no photos to begin with, and so that's sort of a nice side effect, but the flip side of that being we heard terrible, tragic stories about people's photos that had been ruined, even just recently, thirty and fifty years' worth of their own personal fishing photos that have been ruined in various hurricanes that have come through, and so it is timely and important work that you're all doing in getting these caught and scanned.

MS. BYRD: Thanks so much, Jennifer. I think those are great suggestions, and I want to give kudos to Allie. Allie has really taken the lead in developing this project in FISHstory, and she has done a really wonderful job, and I think kind of noting the oral history piece and how that could fit into this project is a really good point. I know we've learned a ton from Rusty, from just talking to him about these photos, and that's important information that needs to be captured down, and so thank you for your comments and suggestions.

DR. SWEENEY-TOOKES: Absolutely. I hope you've been recording Rusty too, because that is valuable information. I wanted to make one last comment about one of your earlier slides, if that's all right, before I turn this mic off again, and that was back on the -- I think it was Number 4 in your presentation, where you were looking at, or you were pointing out, topics and data needed and potential outcomes, the lovely chart.

I think Tracy may have mentioned this before, but I'm not positive, and she and I are in year-two of a two-and-a-half-year Georgia-Sea-Grant funded project on fishing infrastructure in Georgia, and so there's been multiple facets to that project, but it's definitely addressing that data need, and we, like you, are in the final stages, and all ready to do our educational public outreach this summer, all up and down the Georgia coast, which is now, as you were saying, being postponed, and so we're not sure what's going to happen with that yet, but we definitely do have some data that will be available, I would say within the next year, definitely.

MS. BYRD: That's awesome. Thank you so much for kind of sharing that, and I may follow-up with you and Tracy afterwards. I would be interested in learning more about you all's project.

DR. SWEENEY-TOOKES: Yes, please do.

MS. BYRD: Thank you.

DR. CROSSON: I have one more question. I was intrigued, and I like the idea that you're using the lumber as a standard measuring tool, and did you say that one of the things they're going to be doing in this is not just identifying the fish, but are they trying to measure them?

MS. IBERLE: The measurement aspect is going to be done in-house at this point. We really wanted to nail down a standard methodology for this process, which is kind of what we're battling with now, making sure that this lumber is actually the measurement that we think it is and making sure that we incorporate any error into that, and so we're keeping that in-house at this time, and we've had some discussion about it going to the citizen scientists, but I think that is really long-term. It's a long way off at this point. Julia, do you have anything to say on that one?

MS. BYRD: I think Allie is right, and so, right now, Allie and I, and Allie is doing the bulk of this, is we are -- Chip and Mike Errigo are involved, and we're trying to do this methodology and look at things like precision between two measurers, like Allie and I, and then looking at accuracy, how, by measuring items of known length, and kind of outside of these photos, just to see how accurate we are, and so there's a lot that we're doing to try to kind of develop the right methodology, and so I think, eventually, that may be able to transition to citizen scientists, although it may be kind of gold-star volunteers for a program, because it can be pretty tedious to get those measurements right, and so, right now, as Allie said, we're just kind of developing the methodology in-house, and we're going to pilot test it with king mackerel, to see how well it works, and then I think, eventually, I think you could, within the kind of marking tools, you might be able to be able to collect that sort of information through Zooniverse, but we're just not there yet.

MR. HADLEY: Really quickly, before we move on, Chris, I see your hand is up, and I didn't know if you had another question or comment.

DR. DUMAS: Yes, one more quick comment. I've been doing a project with Harbor Branch Oceanographic Institute, and one of the things we're working on down there is artificial intelligence and identification of coral species and sizes from underwater video and photos, and we're working to develop machine learning and artificial intelligence algorithms to do that.

Also, our data science program at UNC-W is doing the same thing, and one of the things those folks need is datasets to practice training their machine learning algorithms on and improve their machine learning algorithms, and so, if you scale this up, eventually, once you have a good set of photos that you can identify the fish species and measure them, you might want to team with the data science program, to see if they can identify a machine learning program and train an algorithm to help you identify or count or measure fish on these photos, if you really scale up big-time. I know they're looking -- At least at UNC-W, they are looking for datasets that they can use to help their -- Each student needs a dataset for their master's thesis or PhD thesis to develop their machine learning algorithms around, and so your dataset could be something they work with, and they might be able to produce something useful for you, eventually. Thanks.

MS. BYRD: Thanks, Chris. That is really cool, to know that you and kind of folks at UNC-W are working on that. I think it would be very cool just to see if AI can help do some of this work, and I know it's challenging, especially in these black-and-white photos, to exactly key-in on what you're doing and to identify the species, but that is definitely something for us to consider, and I appreciate you kind of sharing that information.

DR. CROSSON: If there's nothing else, I guess that we're done, and I'm really very interested, and that was a very nice presentation, and I think this is really going to have some interesting results, and I can see a lot of labor that's going into this, but I will be very curious, looking at some of the length comps over time of some of these species, once it's all done.

MS. BYRD: Thanks, Scott, and we really appreciate you guys providing feedback and letting us kind of present information on the program, and specifically this project, today. Thanks so much for the time.

MS. IBERLE: Thank you guys so much.

MR. HADLEY: I assume, Scott, that we'll move on to the next agenda item?

DR. CROSSON: Yes, if Christopher is ready.

MR. HADLEY: Okay.

THE SEFSC TECHNICAL MEMORANDUM ON THE ECONOMICS OF THE KING MACKEREL AND SPANISH MACKEREL FISHERIES

DR. LIESE: Thanks for having me again. My name is Christopher Liese, and I'm an economist with the Southeast Fisheries Science Center in Miami, and it was, I think, pretty much like a year ago that I think I presented to the SEP the same sort of economic results, but for the snapper grouper fisheries, and this is an effort we've been doing to generate these new economic reports,

and they are supposed to be annual, and they're still behind on the 2017, and so that's why this is still about the 2016 data year.

I went through length on the method on the snapper grouper report last year, and it was -- It's pretty much exactly the same method that we used, since it's the same databases, and so I will focus entirely -- Not entirely, but primarily on the results for the king mackerel in the South Atlantic in 2016, and I will quickly refresh and zoom through the methodology and the background, but really try to keep that very, very short and just zap through slides.

The survey design, the intention was always to come up with financial statements for the fishery as a whole, so that we could track the performance and the economic condition of these fisheries, and we were led by sort of the accounting processes of trying to account for all the revenue and all the costs, so that we can calculate the net cash flow, or the net revenue, and the profit, when we add in sort of intangible costs or opportunity costs that are not usually sort of explicit costs, and we also do a stylized balance sheet to get at what the value is invested in these businesses, and so that is the idea, and we've been gearing all our data collections towards collecting that data, and so pretty much the minimum resolution that's still useful, to keep it simple.

The survey questionnaires themselves, we've been on the logbook since 2002 and 2005, and the logbook has been around since 1993, though I'm not exactly sure when mackerel -- I think it was the late 1990s that it became a requirement for mackerel. We assume that the logbook data is sort of a census for the economic research that we do here, and so that's an assumption that's not always entirely valid, but it's good enough for what we do, most of the time.

Since 2002 in the South Atlantic, we've had an economic section at the bottom of that logbook, and it collects variable costs, such as fuel used, bait, ice, groceries, and it asks about the trip revenue on that particular trip, and so that's linked to the catch data and the effort data and all that.

At the beginning, before a calendar year starts, we sample about 20 percent of the permits that have vessels, and we have a stratified sampling protocol, and these vessels basically are supposed to fill out that economic trip section on each trip across the whole year, and then, after the year is done, and so that's over a year later, we send them a separate annual economic survey, and that primary goal is to collect the fixed costs and the holistic vessel-level activity, and so a lot of these smaller vessels also engage in state-level fisheries, which are not reported to our federal logbooks, and they do for-hire trips, and some do all kinds of other stuff, and so the annual survey is supposed to fill in those gaps, but it's really a separate stream of data, and we get the vessel value, which is also important.

We have been doing these data collections for quite some time, but it's only been in the last few years that we've tried to sort of come up with this systematic way of reporting, and so any year, in one year, there might be somewhere around 40,000 trips in the logbook sample, and so those are very heterogenous trips, and they could be small day-trippers to like large longliners, and it's from North Carolina through Texas, and you never know what these vessels are going to catch on any one trip.

If you want to look at any particular fishery, you don't know who in that dataset is really going to be relevant to you, and so, in the past, people have used the data piecemeal, pulled out the parts they needed and cleaned it up and used it for their research question, and so our goal was to

systematically, and sort of semi-automatically, clean the overall data, and so, at the end, we can always pull out the segment of interest that we wanted to pull out and not have to go through all the cleaning and processing and joining of datasets again, and so the problem is that economics is always a sample, and so the exact sampling frequencies and intensities differ depending on your sample, and so you never know these -- It gets complicated statistically.

We built that with the help of R and Markdown, and especially a contractor, Liz Overstreet, who helped -- Well, she built it, in terms of programming it, and, again, I mentioned more about that in the last presentation.

We generate diagnostic reports so that we can pull out any one sort of segment of interest and then really sort of baggage check it and make sure that the statistics are good and that the cleaning works, because, again, most of the cleaning is automated, and so you have to check if it actually worked well afterwards, before you report it, and so, when everything passes the check, then we put it into our tech memos, and that's what the king mackerel and Spanish mackerel tech memo did, and so, in that report, we had eight different segments of interest.

There is the South Atlantic king mackerel fishery as a whole, the Gulf of Mexico king mackerel fishery as a whole, and we break both of those fisheries into vertical line and trolling separately, and now, to be honest, from a qualitative economic perspective, none of that gear differentiation makes much difference, and so it's in there, but it's really more for -- If there's a particular policy question, those numbers are more valuable.

We also have the Spanish mackerel in the tech memo, which is separated out for the South Atlantic and Gulf of Mexico. The Spanish mackerel fishery is sort of -- There is an important disclaimer for it, which is that the census assumption does not work for the Spanish mackerel fishery. More than 50 percent of the landings do not result in a federal logbook, and so people are selling it directly to dealers, probably state-level fisheries, and so that's a very important disclaimer with the Spanish mackerel numbers. I would still say that they are probably the best available science for the economics of the Spanish mackerel fishery, but we just don't know about 50 percent of the fishery, and so they might be better than nothing, but they have a big disclaimer.

For the rest of this presentation, I am going to focus on the South Atlantic king mackerel fishery, and, in particular, on the year 2016. All of these results consist of six pages, in each of the tech memos. Each SOI, each segment of interest, generates six pages of results, and the first one is the census data at the trip level, and the second page is the sample data from the logbook economic survey. The third page is the annual vessel level summary, again from the census data, but now we're looking at vessel level and not at trip level. The fourth page is that annual economic survey summary, which is a sample, and then we have two sort of time series pages, where we look at three years in a row, which is all we have for now.

King mackerel in the South Atlantic, and I should always start these results with a major disclaimer, which is we're looking at these logbook data for our economic purposes, to sort of present the context for the economic side-by-side. These numbers are not sort of identical to what's in the stock assessments or the ACL numbers or quotas or what other official numbers float around. Hopefully they are usually similar, or differ for known reasons, but they should not be mistaken as such, and so, if someone wants the official sort of logbook landings data, this should

not be the source, and those requests should go to Dave Gloeckner and the Southeast Fisheries Science Center, but, generally, we try to follow the same pattern.

Now, for king mackerel, I need to say one other very big disclaimer, which is the way we programmed this was on the council's sort of jurisdiction in the South Atlantic, and so, as you can see from the map, we have the fisheries off the east side of the Keys in the South Atlantic king mackerel segment of interest.

The truth is I believe that the king mackerel fishery uses the Miami-Dade County border, which would run somewhere over here as the cutoff for what they call South Atlantic king mackerel and Gulf of Mexico king mackerel, and so I don't have the skills to reprogram it, and it has a whole bunch of extra issues that develop when you try to split up these vessels by king mackerel, and so we stuck with a water body, and so these numbers might have a little bit too much -- The census data have too much trips in here that would, strictly speaking, be catching Gulf king mackerel, but they are a minority, and I think, in the big picture, they will not be biasing the South Atlantic results too much.

In 2016, there were about 10,000 trips that caught at least one pound of king mackerel, which is what we're calling the king mackerel trips, and there were 640 unique vessels among them. They generated about \$7 million of revenue on those trips, and about \$5 million of that was king mackerel revenue, and so you can see that the percent of revenue on king mackerel trips, by our definition, is about 73, and so two-thirds of the revenue is from king mackerel, and the other -- Sorry. Three-fourths. The other quarter of revenue is coming from other species, and you can see that 50 percent of the trips for king mackerel are very specialized on king mackerel and pretty much catching nothing else, but it does leave 5,000 trips that do catch substantially other species, especially these thousand trips down here. They catch all kinds of stuff in addition, and so they might not primarily be king mackerel trips, but snapper grouper trips.

We have the descriptive statistics out of the logbook, and these trips are usually one day long. The crew size might be a little bit -- One person or two people, and that depends, and they generate about \$660 of revenue on each of those trips, and so, of these 10,000 trips, we have economic data, and, basically, we selected 2,700, and that's not -- We didn't select those, and we selected vessels, and then they took trips, and they reported economic data. It turned out that 2,737 of those trips should have reported economic data, but, in fact, only 2,669 did report economic data, and then, after cleaning, we are left with 2,630 trips in 2016 that generate our economic data for king mackerel, South Atlantic king mackerel, trips.

These are the summary statistics for the trip level economics, and so, up top, you see the days-at-sea, crew size, and landings, and total revenue is very representative of all the trips, and so that's coming, and these are estimated predictors of what it is, and they are very close. Landings are a little lower, which means that the price for these trips must have been a little higher, but, generally, this is a check that the sample is representative of the population, and then, below that, we have the economic results, and I don't think that I'm going to go through these, but there is basically all the different variable costs, and then hired crew, even though it's not that dominant in this fishery, still it's the biggest cost, followed by fuel costs.

The net cash flow on a \$660 revenue is about \$400 is what goes to the owner and the vessel. If you add in an estimate of the time that the owners, because most of these vessels are owner

operated, 86 percent, then you subtract another \$200 for the opportunity costs of time, and you're left with about \$200 sort of as the margin on the trips, and this is -- In the diagram, you can see 22 percent of the revenue is for fuel and supplies, and 17 percent gets paid out to hired labor, but, when you include the owner labor and monetize that to the opportunity costs at the time, you get about 50 percent of the revenue goes to labor, leaving 31 percent for cover and fixed costs and profit margins and all that.

Other numbers we have is a little bit of sort of productivity measures, and they generate 8.8 pounds of landings per gallon of fuel used, and the hired crew makes about \$200 per day, and so we also then look at these economic numbers in a time series perspective, and this is 2014 to 2016, and we express all those costs as percent of revenue in the year, and that sort of makes it more comparable, since these are always different samples each year, and sometimes they're a little higher and bigger and smaller trips, and, really, they are pretty consistent over time.

The one thing you can see is the fuel price did come down substantially, from 2014 to 2016, and that's reflected in the fuel price share, but, other than that, they paint the same picture, and I would suggest to analysts, if they want to use any of these data, to see if they can use the three-year averages, rather than individual year data, because it's always going to be a little less noisy.

After the trip level, then we go to the annual vessel results, and it's basically the same, 640 vessels, but, in addition to the 10,000 king mackerel trips, they take another 9,000 trips that don't touch king mackerel, and most of these are going to be probably snapper grouper trips, because they seem to be much higher revenue leading to these vessels, these 640 vessels, in terms of a year, and they're only making 26 percent of their revenue from king mackerel, and, in fact, that 26 percent is an overestimate, when I say "revenue", because that's from the logbook fisheries.

There will be other catches, non-logbook fishery catches, such as blue crab or oysters or state-managed fisheries, which will push this number down, and then there is going to be the whole for-hire part of their business, which is also generating revenue, which pushes it down, and so this is really an upper limit of what this is, but it's important to realize that, when we are looking at annual vessel level results, less than probably a fifth of their revenue is king mackerel, and so the economics and the characteristics of these vessels are driven by many other things and not just king mackerel.

We have the permits, and most of these vessels have the dolphin wahoo permit, and about 40 percent have snapper grouper permits, and then almost a third have for-hire permits, and we summarize at the annual level the logbook data, and we have some vessel characteristics, and I will leave it at that. Again, from these 640 vessels that we know did king mackerel that year, we have useful data, on the annual survey, from 114 vessels. Based on that data, we generate annual economic data, and so, if they are owner-operated, it's a different question, and it's 98 percent, and about 19 percent of those vessels, and so basically one in five, was actively for-hire fishing.

The average for all the vessels is fourteen days for-hire fishing, and so the truth is that, most vessels, the median is zero, and so most vessels do not for-hire fish, but, the ones that do, they often spend most of their time for-hire fishing and generate large numbers.

The average vessel value was \$67,000, and so that's not too expensive, and not that valuable vessels, and revenue, overall, was about \$50,000 in 2016, of which almost \$13,000, on average,

was from for-hire fishing, and then the cost numbers are here, and, again, they are cost numbers at the holistic vessel level. They are probably more for-hire numbers than they are king mackerel, because king mackerel is less than 25 percent of the commercial fishery, and so there are all kinds of numbers mixed together, and it's what these vessels do.

Again, we estimate the owner operated vessel time, which we monetize at about \$8,000, and we also derived sort of a pretty simple -- I think it was 5 percent of capital costs estimate of the depreciation for the vessel, which was \$3,000, and so, again, we have this example where we have the net cash flow is about \$10,000, and that's sort of what the owners have in the bank after the year, but the net revenue from operations is very close to breaking even, and so these, again, are the numbers in percentage term.

About a quarter goes to fuel and supplies, 40 percent to hired labors and owners, and another quarter to the fixed costs and overhead, and, if you add in depreciation, it's basically a third goes to the fixed costs, leaving a small margin at the end of the year, and this was 2016. If we look at it in terms of time series, again, we get a percentage and average it across years, and the 2015 was actually negative, and we come up with about a 1.6 percent margin, which is basically breaking even. They are paying for the boat, and they are paying for their own labor, and this would be pure profit. This should be resource rent, in an actual resource setting, but not if it's open access, and so it's sort of what we expect, and we wouldn't expect this number to be very positive under current management.

I think just to drive home the point that, if we compare the numbers for the snapper grouper fishery and the king mackerel fishery, realizing that snapper grouper is only 72 percent snapper grouper, and king mackerel is only 24 percent king mackerel, we can see that the cost percentages are very similar, in terms of the king mackerel is a little but more owner-operated, but, together, these labor numbers are very similar, fixed costs and depreciation, and then both of them are basically breaking even, and so we're sort of measuring the same thing again, and I think that is all I have. Thank you.

DR. CROSSON: Okay. Does the committee have any questions for Chris? This is very similar to what we saw last year, but just a different fishery.

DR. YANDLE: I just wanted to say that I'm still just really impressed at the potential this whole system has for turning around how quickly we get information and standardizing it for comparisons across fisheries, and I really love this stuff. That's it.

DR. LIESE: Thank you. We can -- If there is special requests, we're happy to share results. Generally, if someone needs something, we can try to turn it out, and John had asked me, I think, a while ago about dolphin, and there is issues with dolphin in this dataset, because lots of it is also in the HMS, but, nonetheless, we could run it and get the results that we have in the coastal logbook, and so I am happy to try to run it for people, if they want these results, because, when we generate the results, those six pages, they are not confidential. Unless there is only three trips or three vessels, I can usually share that with people. Now, how good the quality is, it depends, but we can evaluate that case-by-case.

DR. CROSSON: Looking at the roadmap, the only questions we have really are whether we agree that the tech memo should be considered best scientific information available for the council to be

using. I would be surprised if we have any objections to that. Anybody have any other recommendations?

DR. WHITEHEAD: I have no objections to that.

DR. DUMAS: I have no objections. I think it's great.

DR. CROSSON: Yes, I do too. Good. Okay. All right. Thanks, Chris.

DR. LIESE: Thanks for having me.

DR. CROSSON: So we're done there. Do folks want to take a ten-minute break before we handle the last agenda item for the day? I am going to propose that we get up and stretch for a minute. I'm going to go get myself some coffee, and then we'll reconvene maybe at 3:10.

MR. HADLEY: That sounds good.

DR. CROSSON: Okay. Thanks.

(Whereupon, a recess was taken.)

DR. CROSSON: Next on the agenda is best fishing practices.

DISCUSSION ON BEST FISHING PRACTICES AND PERSUASION

MS. WIEGAND: I will go ahead and get rolling, and so, like John mentioned earlier, the council has spent the better part of the last two years working on Snapper Grouper Regulatory Amendment 29, or, as it's more affectionately known, the best fishing practices amendment, and out of that amendment came sort of four different regulatory measures.

The first, and perhaps most important for this discussion, is the newly-proposed descending device regulation, which will require all vessels that are fishing for or possessing snapper grouper species to carry a descending device onboard. There is also a very specific definition that goes along with that regulation to determine what a descending device is, and it includes things like requiring a sixteen-ounce weight, requiring a length of line long enough to get the fish down to at least fifty feet, and having the descending device readily available for use.

Once the proposed rule has been published, we'll be going forward and really pushing those specifics, in terms of outreach, and that descending device regulation is for private recreational anglers, for-hire anglers, and commercial anglers, and so across-the-board.

The other regulations that came with that amendment were circle hook regulations, and the first is to require non-offset, specifically non-offset circle hooks, north of Cape Canaveral for the snapper grouper fishery and then non-stainless-steel hooks throughout the entire South Atlantic EEZ, and then, of course, powerheads was the last thing that was addressed in that amendment, which doesn't quite fit with the best fishing practices, but, just as a note, once this regulation has been approved by the Secretary of Commerce, it will allow powerheads to be used for commercial and

recreational harvest of snapper grouper species off of South Carolina, consistent with the rest of the South Atlantic.

That is sort of the background. Like John said, this amendment has been submitted to the National Marine Fisheries Service and is undergoing their review process, and so the next step for us, as council staff, is really to push outreach, and so I am going to turn it over to Cameron, our Outreach Program Coordinator, to talk a little bit about the current effort and some upcoming outreach efforts that we'll be getting into once this COVID situation has resolved itself.

MS. RHODES: This is Cameron Rhodes. Thanks, Christina, for all that background information on the amendment. This is kind of a unique amendment, in that it's relying rather heavily on behavior modification. Not all of our amendments are so reliant on that, and the council was really set on having a strong outreach component associated with this amendment as soon as it was approved, and they really wanted to be sure that stakeholders were given fair access to lots of different information about best practices, why it's something that should be used, and the different kinds of tools that are available to people that they might make at home or they might purchase.

As part of this effort, we have been busy promoting best fishing practices and developing a more structured campaign to encourage the use of descending devices, while also communicating the upcoming regulations for stakeholders in the South Atlantic, and, as Christina has noted here on this slide, we have attended quite a few different events, some of which for the first time, and so we were really excited.

We sent Christina to the Miami International Boat Show, which is a huge event, and she was great, and we've got lots of videos from her talks there, where she tagged along with Spud Woodward, one of our council members, who has a strong relationship with Yamaha, and they were able to talk about descending devices and all these incredible tools that are readily available for people to use and to access, and so then we also were able to go to the Florida Keys Seafood Festival, Georgia CoastFest, and we were able to speak with lots of different people in those communities, to get a feel for what their needs are and to see how we can encourage best fishing practices for them.

We are hoping that, in the future, we're going to be able to attend ICAST. We have in the past, and we have always focused, in some way, on best fishing practices, but, this time around, we are almost solely focusing on best fishing practices, in addition to having a focus on the new, exciting FISHstory project, which you received a presentation on a little while ago.

We are really hoping to drive these messages home and trying to make sure that people understand what the regulations are, but also get a better feel for why these regulations could benefit them down the road and why it's so important for them to start using these tools that are available to help better survivorship of released fish.

We have also been heavily reliant on this best fishing practices tutorial that Christina has linked there, and that was developed in partnership with the South Carolina Wildlife Federation and with NOAA Fisheries, and that tutorial seems to be wildly popular with users, and it also gave people the opportunity to get a free descending device. After they took the tutorial, they could sign a pledge that they were going to participate in a survey, and then, as a result, they would receive a SeaQualizer in the mail.

We also are in the process of developing a best fishing practices webpage on our website, which is going to hopefully become a resource for people, a great landing page where you can then get funneled off into all the available resources that are out there provided by state agencies, groups like Sea Grant, and there's lots of different material that's already available, and, rather than reinventing the wheel, we're going to rely really heavily on other folks, to see what tools are getting the most attraction from people, what has the highest number of hits, especially with things like videos on YouTube and things like that, and so we're going to try to pull some of those highly-visited resources all together in a location on our website, so that it can become a central landing page.

It's also going to feature the classic best fishing practices as they are represented by FishSmart, and so we're relying really heavily on those folks, and they have been really tried and vetted, so we know that those best fishing practices are some of the ones that we want to drive home with people, not just focusing on the use of descending devices and barotrauma mitigation, but also focusing on planning ahead and making sure that you are targeting a species that is in open season, and so we're covering a whole gauntlet of things, but we're really trying to drive all of those messages home in a way that's nice and clear.

In addition to that, we're really trying to focus on engaging influential members of the community, and many of the young, hip people, the millennials, will say that we're targeting influencers, and that's really what we're trying to do in the fishing community, is reach these people who have the ability to connect with lots of different people across social media, and they have the influential pull.

As a quasi-governmental agency, it's very difficult for people to buy into the things that we're encouraging them to do, and we recognize that. We are perceived as "the man" a lot of the time, and so what we're aiming to do here is to work with individuals like Fly Navarro. I don't know if you all are familiar with Fly, but I definitely encourage you to check out some of his videos online, and he's all over a bunch of different social media platforms, and you can find him at Fly Zone Fishing, and you can also -- He started a program, which is like the -- I think it's Fly Encyclopedia of Fishing, and so he's been really active in trying to engage users and let them know about all these different kinds of fishing techniques that are out there and investigating tools, and so Fly is going to partner with us in developing a video series, which we can post all over our website, as well as social media.

Those videos are going to focus on the different kinds of descending devices that are available, the homemade ones, all the way to the SeaQualizer and to RokLees and all these different ones that are out there, and then, in addition to that, we're going to have some interviews with different scientists and fishermen, to get their take on why this is such a valuable thing for people to start implementing in their daily fishing routines, and we're really excited about it.

It's currently on hold as a result of COVID-19. We had planned to go out in May and have a fishing trip, where Fly was going to bring a camera person, and we were going to go ahead and get everything rolling, but, right now, that's temporarily on hold, until everything starts to settle down, and then we can get this back on track, hopefully ahead of the amendment's implementation down the road, but we're still excited, and we're seeking other opportunities like this relationship with Fly in trying to connect with community leaders.

It's possible that we'll be able to get this in the hands of Deer Meat for Dinner, and that's another one online that has quite a large following, and I think he has over a million subscribers to his YouTube channel, and he has done a lot of fisheries work as well, and he recently did a video with one of the pelagic-sponsored fishermen, highlighting the use of a descending device for a snowy grouper, I believe, that was closed to season, and so lots of cool things going on.

We're staying busy, and we're trying to put together this campaign, and this is where I think we're going to rely rather heavily on you all, to get some guidance as to how we can start to make sure that our language is persuasive and is really founded in some true scientific understanding of persuasion, so that we can make sure that we're presenting the best case when trying to communicate with fishermen and stakeholders as whole about these best practices issues that are coming up and the needs, and so we're really excited to keep moving this forward, and, if you all have any questions about what we've been doing or what we have planned to do, please feel free to ask me.

MS. WIEGAND: Thank you, Cameron. I guess I'll go ahead and pause here for a second. Does anyone have any questions for Cameron specifically about these different outreach efforts that we've done or are planning to do in the future? I am not hearing anyone jump up, and so, once we get to the end of this presentation, there will still be more time to chat about our outreach efforts.

What we really wanted to do for this discussion is focus on this idea of persuasion, and we've talked to you guys about outreach for best fishing practices a couple of times, but we wanted to take sort of a more specific direction with this conversation, and so the next few slides are just sort of a refresher, almost, of persuasion literature, and this is not my background, but it was something that was covered for my comprehensive exam, and so it's nice to be able to bring that back up.

This background is just meant to refresh your memory on persuasion and help provide context for some of the questions that we're going to ask you related to best fishing practices and the type of language that we should be trying to use to modify fishermen's attitudes, because that's ultimately the goal here, is to modify their attitudes towards the use of descending devices and then ensure that those attitudes are then moving in a direction that's going to modify their behavior and get them to use these descending devices, because the regulation just requires them to be onboard, but we would really like them to take that extra step and start using them to descend fish when it's required.

When we're talking about persuasion and attitudes, there are sort of four key attitudes related to fisheries that we might have an opportunity to influence or consider when we're putting together outreach material. The first is attitudes that an individual has towards themselves and their abilities and their personal responsibility, which is something that we would really like to sort of get at here and get at this idea that good anglers use descending devices, or it's my individual responsibility to take care of this resource as an angler.

The other attitude is authority figures, and this is something that we as the council always sort of struggle with, that our management is seen as credible and effective. Luckily, we have seen sort of broad support for the descending device regulation, from fishermen, NGOs, academics, sort of broad support, and so we've got that backing helping us.

The other attitude, of course, is peers, how do fellow fishermen feel about these regulations, are those fishermen respected, are they seen as leaders in the community, and then, of course, attitudes related towards the environment and wildlife, and so are these fish resources worth preserving, are they seen as unnecessary or more of a nuisance, things like that, and, again, the main goal is to modify attitudes that will then influence fishermen behavior.

The literature sort of identifies six key steps to actually modifying attitudes and behavior, versus, of course, exposing fishermen to new information, and, next, we've got to look at what they are actually paying attention to, to get them to actually engage with this new information. Once they have engaged with this information, how are they receiving it? What are they actually storing in their long-term memory that they are going to remember once they have walked away from the information? Then how they are interpreting and evaluating the importance of that information, how they are integrating it into their memory, and then, finally, action, which is ultimately the goal of persuasion.

There are sort of two routes to persuasion that I think we're going to want to get at, and the first is this idea of the cognitive route, and so individuals that think this way tend to prioritize their personal experiences and the knowledge that they have in order to critique any arguments that are presented to them, and so, in this case, they're going to be motivated by processing the information, and the merits of the argument are going to be very important.

On the other hand, you have the peripheral route, and these are individuals that tend to be persuaded more by context clues or assuming that, because it is an expert, or someone they feel is an expert, is speaking, thus the information must be correct, and so they're not really motivated to process information, and the merits of the arguments are less important. The context clues and who is delivering the information, in that case, is much more important.

That was all meant to just sort of provide a context, and I've got a list of discussion questions here that I would like to go through, and so I guess I will just pause here for a second and see if anyone has any questions or sort of overarching comments, and then, if not, Scott, if you would like to run through these questions, and hopefully we can get some feedback from you guys on the appropriate language for our outreach material.

DR. CROSSON: Sounds good to me.

DR. SWEENEY-TOOKES: Before we go any more deeply into it, just a couple of quick thoughts to put out there. As I am looking at this, and the amount of outreach you've done is really amazing, and I'm excited that you all are doing this, and how do we get people to do what we want them to do is sort of an age-old question in public health and environmental science, and I know we talked about this briefly last year, and I just want to bring it up again, just to plant that seed of thought again that public health has done this for decades, and how do we get people to wear condoms, when we know HIV is prevalent, and how do we get people to monitor their diets, when we know that they are prone for diabetes here, and so there might be some more contemporary literature that's going to be more useful for you here.

I wish I could name off somebody for you directly, but we would have to do a little bit of research on that, and so there definitely is likely something that will be helpful, and just if we're talking about -- On the council, we care about the species more, and yet, when I put back on the

anthropologist hat, who sits in communities and listens to commercial fishers, they see themselves as very different animals than recreational, even charter/headboat, and definitely than recreational anglers.

As we're designing this outreach measure and thinking about how to figure out what individual fishers think or feel or what they think of authority figures, that's going to be a very different answer, I think, for any of those groups, which I'm sure you know, but I just have to point it out again, because, listening to fishers in Georgia and in South Carolina talk about snapper grouper and talk about descending devices -- Some of the things that come up over and over is, number one, there's the question about whether or not we even need to worry about whether that snapper survives, because they are, quote, unquote, so many of them, and so addressing that issue just in general first is going to make any sort of outreach more credible.

Another one is that there is a lot of doubt about whether or not the devices work, and I know they work, and you know they work, and we know we have science that they work, but something is breaking down between the science of that and what commercial fishers are actually perceiving or witnessing in their own lives, I guess, and I think that was it. I think they're very different animals, and they're not sure they work, and they see lots of snapper, and so I just had to throw those things out there as you are sort of deciding where to go from here and how to figure out who those peers are or who those authority figures are.

MS. WIEGAND: Thank you, Jennifer. I agree, and I think that's a good point, that outreach to commercial versus recreational fishermen will likely need to be a little bit different, given that they perceive themselves as two very different animals, and it's definitely good to know that there seems to be sort of a breakdown between the science and fishermen feeling like descending devices work, and I think sometimes we communicate with the same fishermen a lot, our A-Team members particularly, who tend to believe in the science and have had good experiences with descending devices, and so it's good to know that that's not wholly the case, and I will definitely take a look at the public health literature, and that's not something that I had thought about. I sort of focused my background on persuasion and natural resources, but you're right that public health officials have been doing this for a very long time.

MS. RHODES: Thank you, and that was really, really great, Jennifer, and I think that's a great point. We have been struggling with this internally a bit, and it appears that, at the moment, that the biggest hurdle is the recreational community, instead of the commercial sector, and so we have been struggling with how to structure everything, including our webpage that we're currently developing, and I will be sure to bring this up with the Information & Education AP, to make sure that what we're putting together isn't necessarily only targeted for recreational anglers and can also be useful to commercial folks, and so we'll definitely make sure that your points come up in that discussion next week.

In addition to that, I wanted to bring up that Brendan Runde has created some really great descending device videos, one of which was pretty popular a couple of months ago, and it features a red grouper being descended using a SeaQualizer, and we have heard from a number of people as well that they don't think that these devices work, and so we're going to lead off whatever webpage we develop with that video, so that people have immediate access to it, and then hopefully that starts to encourage this conversation, that these devices are actually working and filling some

gaps that we clearly have between the scientific community and what guys are actually seeing on the water.

We'll definitely make sure that the Information & Education AP gets to hash this out a bit and make sure that whatever language we're putting together focuses on those multiple different audiences, as well as showing that these things do work, and they actually could make a difference down the road, and so thank you very much for that.

DR. SWEENEY-TOOKES: This is all great to hear, and you guys have done some really, really good work, and I'm excited to hear your thinking about these things, and I was going to call out Tracy too, because I know she sat in on all these interviews with me as well, to see if I had missed anything about the descending devices, but you all are on the right track, and so you'll get this. It's awesome.

DR. YANDLE: I don't particularly have anything to add, and I think Jen covered it pretty thoroughly there, and so I will just say what she said.

DR. CROSSON: You all were talking about the difference between recreational and commercial fishermen, and there is obviously going to be, or probably going to be, different ways that are most useful for outreach, and do you guys think the methods and tools that they've listed here, that staff have listed here, in Discussion Question 1 -- Are there some of those that you think would be better oriented towards one group or the other?

DR. SWEENEY-TOOKES: You know, I honestly think it's more generational than it is fishery related, and I think that -- I mean, I love the tutorial you have put together, and I have to admit that I spent quite a long time playing with that, and I have a feeling that some of the younger fishers will as well. Some of the older fishers, we're talking about people that maybe don't even have smartphones, and so they're very unlikely to interact with web tutorials or watch people on YouTube, but that's where -- You have mentioned the peers and the authority figures, and that's where videos being forwarded via email from one fisher to another is going to hold a lot more weight, necessarily, than whoever Fly Navarro is, who sounds very cool, I think, but probably won't hold a lot of weight for people of not the millennial or Gen-Z generations.

DR. CROSSON: I think the generational thing is a good point, and I think there's probably different ways you reach out for marketing to boomers versus Gen-X versus millennial, and so I'm not really familiar with any of that, but I imagine that there's a lot of stuff out there. How about this second question of what strategies should be used to make the material engaging? Any thoughts on that?

MS. WIEGAND: I can expand a little bit on that question, if you would like. My thought was how do we get fishermen to actually participate with the information, sort of getting at those six steps? How do we get them to engage with it, so that then they're walking away with something stored in their long-term memory?

DR. SWEENEY-TOOKES: I think this is where, unfortunately, the generational divide comes in again. It sounds to me like everything you are doing, honestly, from Gen-X on down is very effective, and I am finding it very engaging. The older generation, that's a little harder for me to even begin to understand what would work with them. With the younger generation, I will say

that what I am finding more and more, at least in working with college students, is that they want facts very quickly. They don't have a lot of patience for sitting and maybe working through a whole tutorial, and so they need maybe the two-minute tutorial, and so I'm just thinking about attention spans being much, much shorter in younger people right now.

DR. CROSSON: The boomers, I look at my parents, who are on the old side of boomers, and they were born in the late 1940s, and everything is still forwarding emails, and it's like they're -- Probably half the emails I get to my private account are coming from my parents, much more than social media or anything else, and it's something -- It has to be something that usually grabs them, and what that is I'm still a little bit clueless.

MS. WIEGAND: I will say that, and Cameron can confirm that my memory is serving me correctly, but we did have a conversation with a few of the APs, just casually, last fall about where they get their information, and it seemed like a lot of the both commercial fishers and some of the older generation really focused a lot on information that they got through Fishery Bulletins that are sent out from NMFS or from the council or just through word of mouth still, that someone at the fish house or tackle shop will get that notice and then word sort of spreads throughout the community, that that's primarily how they were still getting any of their fish-related information.

MS. RHODES: Christina, that's exactly right, and those conversations were really interesting, because I don't think there was a single style of delivering information that wasn't used. I mean, every single person used something different, and they seemed to rely pretty heavily on that one thing, which I guess speaks to them being representative of the fishery, and lots of different people are relying on lots of different tools to get the information that they rely on, but it also presents some challenges. I don't think we're going to have a single approach to any of this, and I think we're going to have to be pretty multifaceted with how we distribute this information, but the AP definitely enlightened us to that fact with their responses to that question.

DR. SWEENEY-TOOKES: You all have your work cut out for you on this one.

DR. CROSSON: Yes. How about attitudes? I mean, to me, discards -- From the commercial sector, I constantly hear one of the biggest gripes with fishermen is that they have to discard something because of seasonal closures, that they're unhappy with it, and there are some fish that are worth keeping, and they have to discard it, especially if they're irritated about the potential mortality of that fish once it's been discarded.

It seems like this should be something that they would naturally gravitate towards, but I guess, if their attitude is going to be to trust in hearing that the devices actually work, and I don't know how to get at that, at attitudes. Other thoughts?

MS. WIEGAND: I guess I will add to that a little bit. One of the things we've talked about a lot as staff, and that we talked about last time I presented to the Information & Education Advisory Panel, was this idea of finding a way to push social responsibility and peer pressure and to have fishermen feel as though it's their responsibility to take care of the resource or this idea that good, experienced anglers utilize descending devices, and do you think that's something that the council can try to foster or something that will just sort of happen on its own?

DR. SWEENEY-TOOKES: I really can't speak to anglers, but I would say that, with commercial, that might backfire. That might be a case of now the man is telling us how to do the thing that we've been doing for generations.

DR. YANDLE: I was about to head down a similar line, that that's a really careful line to tread, I would say actually with both communities. That's one where you want your thought leaders, your authority people in the community, pushing that message, rather than you guys doing that yourself.

DR. CROSSON: I wonder how much one sector's attitude about the other sector's conservation ethic matters. If the recreational guys -- If there's a large number of anglers that tend to think the commercial guys are discarding fish and not conserving them, whether that rivalry is something that can be turned into something more productive. I don't know.

DR. DUMAS: I think you guys ought to make a funny video, where you've got a charter fisherman, or a commercial fisherman, and he's got a fish, and he needs to use a descending device and send it back down, and so he's kind of exasperated about doing that in the video, and it's a TV video, but he goes ahead and does it anyway, and he puts the fish on the descending device and sends it back down, and then you've got an underwater shot where the fish, after he gets released, swims out of the field of view, and then he swims back into the field of view with a can of beer, and he attaches it to the descending device, and, when the fisherman pulls back up the descending device, there's a little -- There's a can of beer, and there's a little note on it that says, "thanks, dude" from the fish. The fisherman says, "all right," and he grabs the can of beer and drinks it, and that's it. Then something like use descending devices, and it makes fish friends or something like that, and I think that would be great. Make it funny. That's my two-cents.

MS. RHODES: I love that idea. That's amazing. I think that's a great idea, and we'll give you production credit on that. We'll have you as one of our producers there, Chris.

DR. DUMAS: As long as I can be the fisherman on the charter boat, and I get to drink the can of beer, then I'm good with that.

MS. RHODES: Deal. Sounds like a plan to me.

MS. WIEGAND: I fully agree. I think sometimes kitsch and silly videos like that actually do work to get people's attention, and we have passed around a number of times, as staff, a descending device rap that they did out on the west coast that is cringy and cheesy, but people watch it and love it, and so I think there's actually something to be said for silly videos.

MS. RHODES: I agree. There's a group that is -- I think it's with American University, and they have an in-house film festival, where students produce videos which focus on comedy and environmental policy, and some of the videos that come out of that are really quirky and cute, but they still encourage a nice environmental message, and so I like that idea a lot, in all seriousness, and I wouldn't be surprised if that's something that we could work out alongside our partnership with Fly Navarro, Chris, and so I'll be in touch with you about that one.

DR. DUMAS: All right. Sounds good. Just a modest share of royalties is all I ask.

MS. RHODES: Okay. We'll see what we can do.

DR. SWEENEY-TOOKES: If you keep that fish hook really innocuous and generic, then you don't ever have to address whether or not this is recreational or commercial that you're aiming this at. This is a fabulous idea, Chris. I love it.

DR. DUMAS: I don't know if this is gender appropriate, but you could do another version of the video, the same thing, but you send down the descending device and what comes back up is a mermaid attached to the descending device, and she waves and says, "thanks, man", or something like that, or thanks for saving my fishy friend or something like that, and I don't know, and then swims away, and I don't know. I will end with that. Maybe I should have just stuck with the beer.

MR. HADLEY: I think what we're hearing is many multiple versions.

DR. CROSSON: Any thoughts on the other questions about encouraging leaders or evaluation?

DR. MURRAY: This is probably obvious, but focus groups for evaluation of materials, once they're prepared, might be a useful way of seeing how they land on the intended audience.

MS. WIEGAND: That's a good idea, and I hadn't thought about using maybe some of our advisory panels as sort of test groups for some of this outreach material, just to get their feedback.

DR. CROSSON: Yes, absolutely.

MS. WIEGAND: It would usually come to them before, sort of like you guys, saying what do you think we should do, but it could be good to sort of, once we've put something together, to then bring it to them.

DR. CROSSON: Give them several options and have them vote which they like the most.

MS. WIEGAND: I guess the last thing that I would really like to get your input on is really this question about language, what language should we be using, or what language should we perhaps make sure to avoid, and you guys had made a good note about how, if someone is going to be pushing this idea of social responsibility and being an ethical angler, that should come from influencers and leaders in the community, as opposed to from the council, and, if you guys had any recommendations, both of language that we should be using as the council staff, versus anything that we should really try to make sure we avoid.

DR. SWEENEY-TOOKES: This is probably completely unhelpful, but all I can say is I would know it if I saw it, and so, if you were ever at a point where you would like some of us to look over materials, I do volunteer myself for that.

MS. RHODES: We will definitely be taking you up on that, for sure. Thank you.

DR. YANDLE: This is also probably blindingly obvious, but just keep it positive. I am also happy to look over materials too, when the time comes, if you want another set of eyes.

MS. WIEGAND: The more sets of eyes we have on this, the better. We definitely never say no to extra input, especially from people that haven't looked at it again and again and again.

DR. CROSSON: Okay. Is there anything else that we can do for you on this item?

MS. WIEGAND: No, and those were sort of the key issues, unless you guys had any other advice on how we can evaluate the effectiveness of our outreach material, and I know that that can be sort of a large discussion in and of itself, and it can be particularly challenging. If not, then this project is going to be a long-term project that I know our outreach staff has put a lot of time and love into, and so, those of you that have volunteered to look over some outreach material, you can look forward to seeing some stuff from us, but we appreciate the help and input.

DR. CROSSON: Thanks, all. We have discussed -- We are definitely going to wait on the discussion on allocations until tomorrow, and so 8:30 tomorrow morning I think is what the agenda says.

MS. WIEGAND: Yes, 8:30 tomorrow is what's on the agenda.

DR. CROSSON: All right. I think, tomorrow, we will do that, and that should occupy a good amount of time, and then we'll go over some other items, and if you all -- I will give -- Christina and John have asked me to give a quick update on what NOAA has been doing, in terms of dealing with the virus, in terms of the economics and social end, and so I can give that update, and then, if there's additional stuff, additional ideas, that people have for how we should be looking at this, and there's a lot of really great stuff that's going on right now, and I just saw another article in *The Washington Post* about how the seafood industry is in a freefall, and so, if the council staff -- I don't know if you guys have specific questions, Christina and John, beyond just looking for general input.

MR. HADLEY: Really, one thing we were looking at and wanted to have maybe a little bit of a discussion on was we have the efforts going on from NOAA, and we want to try to do what we can to make sure it's a contribution in a positive way, and, at the same time, in our internal discussions, we're thinking about avoiding survey fatigue, and we really don't want to get in the way of efforts of others, and so I just wanted to discuss that a little bit, and, if there's anything that we can do, as far as engaging our APs or what have you, that's certainly something that we would be interested in pursuing and have been talking about pursuing.

DR. CROSSON: All right. That sounds good. Well, since that seems to be it for today, I guess we will reconvene tomorrow morning at 8:30.

MS. WIEGAND: Just a quick note that I'll be on at 8:00 a.m., if people want to get in and start doing mic checks again, and then I would encourage you all, if you haven't had a chance to, to review the story map that's linked in the agenda and overview, and it gives a really good overview of sort of why we're all of a sudden reconsidering allocations and what's been done in the past, which we'll go over a little bit tomorrow, but the story map is really an excellent resource.

DR. CROSSON: I will add one thing that is as much a biological issue as an economic or a social one, but one of the factors that is coming to the Gulf Council's notice, and I think I might have mentioned this is an email, is that some of the allocations, because of the new MRIP revisions, are much larger for the recreational sectors. If you assume that you're going to try and keep the commercial sector even with just a similar allocation and just scale up the recreational side, the

selectivity has changed, and sometimes enough that it will move the ACL or the ABC itself, and so now you're dealing with two different sliding variables at the same time, and it's not as simple as just scaling, and so, if you all have any ideas about how to deal with that from our side -- Think on that tonight and let us know. Otherwise, I guess we'll reconvene tomorrow morning at 8:30. Thank you.

(Whereupon, the meeting recessed on April 8, 2020.)

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APRIL 9, 2020

THURSDAY MORNING SESSION

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The Socio-Economic Panel of the Scientific and Statistical Committee of the South Atlantic Fishery Management Council reconvened via webinar on April 9, 2019, and was called to order by Chairman Scott Crosson.

DISCUSSION ON ALLOCATIONS

DR. CROSSON: I guess we're ready to start on the section on allocation, and I think John Hadley sent out a copy this morning of a Word document of the overview, but look at the discussion questions we have, because we do have some specific questions, and, when I originally was asking people for writing assignments and keeping track of stuff, note that there's a significant component to the discussion questions about social aspects, and so we can't just gravitate towards the economics, which is what a lot of us normally want to do, and try and keep track of how that discussion goes as well. At that point, I guess, Christina or John, and I don't know which one of you is presenting, but I'm ready to go.

MS. WIEGAND: I am going to run through the presentation quickly, but, like you said, this is going to be a discussion that touches on both social and economic issues, and so both John and I will participate and lead the discussion, and I'm just going to lead you all through this introductory refresher of a PowerPoint.

The first thing I'm going to do is just give you guys a little bit of background on how the allocations were set for the Snapper Grouper, Coastal Migratory Pelagics, and Dolphin Wahoo FMPs. We'll talk about the Allocations Committee and what they learned during the first sort of round of setting allocations, and then I'm going to go over some of the qualitative stuff that we talked to the council about.

If you looked over the story map last night, you saw that we're trying to remind them that there may be some issues or concerns they have over using landings history to set allocations, like they have done in the past, and that there are other ways to set allocations, including qualitative approaches, and so these approaches will be something that you all are very familiar with, but I just wanted to review with you what we reviewed with the council, so that you know their starting point.

Then I will go over what they discussed and sort of the direction that they have chosen for staff to go, and this is sort of a very high-level discussion, and it's the first time we brought allocations to them, and now we're bringing it to you, and, without a doubt, this will not be the last time this committee discusses allocation.

First, snapper grouper, and they used quota and other management measures to manage the fishery up until the MSA reauthorization in 2007 that required ACLs, and then, additionally, the snapper grouper fishery does have some jurisdictional allocations between the South Atlantic and the Gulf Council, and those have all been based on landings, and then, in the snapper grouper fishery, there are some gear allocations specifically for the golden tilefish commercial fishery.

Black sea bass allocation was initially set in Amendment 13C, and it was based on the average recreational and commercial catches from 1999 to 2000. Red pogy and snowy grouper were set through Amendment 15B, and, for red pogy, the council wanted to select an allocation that was closest to the status quo, and that was landings from 1990 to 2003. They also discussed being able to adjust the total allowable catch if the commercial was allocated more than 50 percent, because there was such a high discard mortality in the commercial fishery.

For snowy grouper, they were based on the longest time series available, which was 1986 to 2005, and this was to get around some of these shorter timeframes where there were unrealistic spikes in recreational landings that they felt were influencing overall results.

Then you've got gag and vermilion snapper, and gag was set between 1999 and 2003, because it reflected recent catch, and then vermilion snapper was also set using the longest time series available, and so 1986 to 2005, and the council noted that the results didn't change very much, regardless of which sort of timeframe was analyzed.

Then, again, gag, red grouper, and black grouper were addressed in Amendment 17B, which combined all of the allocations and fishing levels. No specific allocation was selected, but the pounds of expected catch resulted from implementing Amendment 16.

Then we get to golden tilefish, and this is the first time we see this sort of long-term/short-term method, where half of the allocation is the mean landings from the longer term, 1986 to 2008, and then half the mean landings from the shorter time period of 2006 to 2008, and they felt that the allocation would near historic harvest, and they did consider a 50/50 allocation, but they felt that that would adversely impact the commercial sector and would provide the recreational sector a limit above what they could feasibly catch.

Red grouper was addressed again in Amendment 24, and, again, you see this 50 percent mean landings from a longer time period and 50 percent mean landings from a shorter time period, and they included the earlier time period when the commercial sector dominated the catch, whereas, in the more recent time period, the for-hire sector had dominated the catch.

Then all the other snapper grouper species were addressed via the Comprehensive ACL Amendment, and most species were done with this long-term/short-term allocation method, and the same with black grouper. The dates were slightly different, and then there were jurisdictional allocations made between the Gulf and South Atlantic for black grouper, yellowtail snapper, and

mutton snapper. Then wreckfish was allocated at 95 commercial and 5 percent recreational, and that was based on public input and guidance from the advisory panel.

Then we get to king mackerel, moving into the CMP fisheries, and so king mackerel was initially allocated back in 1985, when they recognized the two different migratory groups between the Gulf and South Atlantic, and they were allocated based on the largest number of years, beginning in 1979, where they had recreational and commercial catch data available, and these are the allocations that king mackerel is still working under.

Spanish mackerel, similarly, was also allocated as soon as they recognized two migratory groups between the Gulf and South Atlantic, and they used dates from 1979 to 1985 to get the average ratio of the catch between commercial and recreational. However, Spanish mackerel has been modified a couple of times. First, in Amendment 4, it was revised to a 50/50 split, and this was based purely on qualitative data and the council's knowledge at the time, and they felt that the resource was overfished from 1979 to 1985, and that was resulting in lower recreational catches being reported and it was recreational catches may have been affected by increasing commercial effort that occurred in the 1970s.

Additionally, qualitative information that the council had received indicated that recreational catch was likely much higher in the 1970s than was reported and that, since capacity and demand of both of the user groups could catch the entire quota, the most equitable allocation would be a simple 50/50 split between the two sectors.

However, in a 1998 framework amendment, they did choose to modify that 50/50 allocation, because commercial catches were increasing and regularly exceeding their catch limit, whereas the recreational sector was remaining well below its allocation, and so they added 5 percent to the commercial side, for an allocation of 55/45.

Next, moving into dolphin wahoo, the FMP was established in 2003, and it's one of our more recent FMPs, and it established a non-binding allocation in the Atlantic EEZ. The Comprehensive ACL Amendment modified allocations, and, again, you see this half the mean landings for a longer time period, 1999 to 2008, plus half of the mean landings for the shorter time period, 2006 to 2008.

Then, in Amendment 8, the sector allocation for dolphin was set at the average of the percentages of the total catch for 2008 to 2012, and so, getting into what I'm sure are Brian's favorite memories, as he was chair of the Allocations Committee during his time on the council, they were formed in 2007, and they met four times in 2008, and their charge was to address this Comprehensive Allocation Amendment, which was eventually morphed into the Comprehensive ACL Amendment that was triggered by the Magnuson-Stevens Act reauthorization.

They developed four alternatives for the council to consider, and the first alternative was to allocate based on a long time series, 1986 to 2008, allocate on a shorter time series, 2006 to 2008, allocate based on 50 percent the average from the long term plus 50 percent the average from the short term, or split allocations equally among the three sectors, and so commercial, recreational, and for-hire.

At one point, the Allocations Committee and the council had considered using social and economic criteria to set allocations, but, at the time, there were concerns about both lack of data availability

as well as the amount of time it would take to do the analysis necessary to use those types of criteria.

One of the things we did at this meeting was chat with the council a little bit about qualitative allocation factors and tried to get them to have a bit of a value discussion about allocation, since, at its core, allocations really can be sort of a value judgment, and we threw up on the screen this sort of list of possible factors that they could consider, fairness, whether they wanted things to be equitable versus equal accomplishments of a sector, perhaps rebuilding a stock, the needs of the common good, this idea of reciprocity, you know sectors that have less discards or report more, the idea that no group could be set below a set minimum, the cultural importance, the dependence on these different fisheries, and, of course, this just gets at the tip of the iceberg of different values that can be considered when talking about allocations.

Since I felt like this list of things could seem a little obtuse, we did give a few specific examples. If the council wanted to prioritize the common good, they could choose to allocate based on a sector's ability to use the resource, or, if they wanted to prioritize social relationships, perhaps they could consider allocating the resource equally, or, if they're looking to prioritize sector welfare in developing a sector, they might choose to allocate based on who needs the resource more.

Of course, these are challenging questions to answer, and so we reminded them that there are qualitative methods that they can use to help answer some questions, such as what did the fishery look like in the past, how might it look in the future, how much cultural importance do commercial and recreational fishermen attach to a resource, or, of course, the question that all social scientists have endeavored to answer about fisheries, how dependent are commercial and recreational fishermen on a particular resource.

We really wanted to remind them that they can use both. This doesn't have to be an only qualitative or only quantitative discussion, and, oftentimes, these two types of information are going to work together to answer a single question.

When they discussed it, they did express an interest in wanting to use this sort of hybrid quantitative-qualitative approach, where they would consider qualitative sources, such as oral histories, as appropriate, along with some more quantitative data, like landings histories, in order to determine final allocations. They also listed these criteria as specific things they were interested in exploring more, and, of course, landings history, market needs, the idea of fairness and equity, the cultural importance of a species, accountability of a fishing sector, and importance or dependence of a fishery to a particular sector.

They also wanted to get a little bit more information about which fisheries might be served by managing using a single allocation, and so no allocation, and information on expected discard rate, this idea of, if the expected discard rate is high, should a sector be allocated more fish, and so that was sort of the charge to staff, is to sort of begin to look into these criteria and ways that we can provide information on these different criteria that they are interested in.

With that, I'm going to go ahead and stop, and I know there's been a lot of other information that's been sent around regarding allocations, and, again, this will probably be a fairly high-level discussion, and this is just the first time you guys are going to get to discuss allocation, and certainly we'll be bringing stuff back to you on multiple occasions, as the council starts to go

through this process. Here are the discussion questions, and, with that, I will turn it back over to you, Scott.

DR. CROSSON: Okay. I'm looking at these again. I guess the first one -- I won't say it's the easiest, but does the SEP recommend an approach to be used for conducting economic analysis of allocations? We'll just tackle these in order. What do folks think?

MR. HADLEY: Scott, if I could, really quickly, before we get into these discussion questions, I just wanted to express that one of the -- If there is any kind of out-of-the-box approaches that we should maybe be looking at, that's certainly something that staff is interested in, as far as whether it's the analysis portion or just how data or what data is presented to the council, and, in the past, as Christina went over, the allocations have largely been based on landings information, and so any sort of out-of-the-box approaches or different ways of approaching things, we're certainly in, and so, in that context, I will leave it off there.

DR. CROSSON: John, looking at this, like the first question about how the economic analysis should be done, or the second one as well, the social analysis, is a very different question from the last one, which is about how you present all of this to the council, and so I guess, the last one, you're looking more for how the council should go about having the discussion, versus how the analysis should be originally done? So you want both?

MR. HADLEY: Yes, that's correct.

DR. CROSSON: Okay.

MR. HADLEY: Also, I will state this. Scott, we've had this discussion on kind of the planning sessions for the SEP meeting, and on the email exchange earlier, but this is likely a multi-year process. This is kind of the first step, and the council is really starting to get into the allocation discussion, which is never an easy one, and we're coming to the SEP this year, and we're very early in the process, and we'll likely come back to the SEP next year, down the road, once we've gotten into it, with more of a nuts-and-bolts approach, as I mentioned in the email, as well as a request for review of some of the allocation analysis that we've done, and so that's just something to keep in mind for SEP members. You will likely be seeing it -- You're seeing it this year, and we'll likely have a slightly different take on things, and we'll be a little bit more down the road and in the weeds, so to speak, of the allocation analysis, but it will likely be a two-step process, at least.

DR. WATERS: John, this question seems to be seeking the in-the-weeds information about our recommendations for the in-the-weeds approaches.

MR. HADLEY: It is, and, if we want to go there, that's absolutely appropriate as well. I guess, when I was saying in-the-weeds approach, I was thinking more along the lines of we have taken these recommendations, and this is thinking to next year, but we've taken the SEP's initial recommendations, and we've taken the council's discussions on the topic, and, at that point, we would probably develop alternatives, and then we're coming to the SEP for review and that sort of thing, and so I guess that wasn't exactly well worded on my end, but if that makes sense as part of the step one, step two approach. It will be more of a review next year.

DR. WHITEHEAD: Am I missing something, or should the answer to this first question simply be we think an approach that should be used is to consider efficiency between sector allocations?

DR. CROSSON: I mean, that's the standard answer that I would come up with. Traditionally, I think this committee has stated, and it's pretty much the norm, that you should be looking at some of the consumer surplus and the producer surplus numbers to get an idea of how productive each of these are, in terms of providing social benefits to society, right? Then also the second question about -- I guess, really, you can immediately jump into opening this can of worms that happened in the Gulf when they had the red snapper reallocation, which is how efficient the allocation is inside each sector as well.

DR. WHITEHEAD: Yes, the Socioeconomic Panel has said that repeatedly over the years, in reference to the first part of your comment.

DR. DUMAS: I was just going to say that I've done some work over the last few years looking at sort of general allocation mechanisms for allocating a resource, taking into account both efficiency and equity, and it turns out that there's been a lot of work done on this in the public choice literature, which is sort of overlapping literature between economics and political science, and there are a number of different methods and algorithms that are used to try to get at equity and fairness, different ways of including that in an analysis, in addition to efficiency, and there is one particular mechanism, and it's algorithm, that I've been working with over the last couple of years that is a -- It's a general algorithm. It's an interactive algorithm that achieves both efficiency and equity, equity in the sense of non-envy, and non-envy is one way of defining fairness, defining equity.

In the case of a fishery, non-envy would be a situation in which no fisherman would want to trade places with any other fisherman, in terms of the allocation that they receive, in terms of the costs and the benefits of the allocation that they receive, and that would need to be true simultaneously for all fishermen in the fishery.

There are a number of different algorithms, but there's one in particular that I've been focusing on, and it was sort of a general mathematical algorithm, and I've been working on allocations to fisheries and other things also, pollution cleanup allocation, and there are lots of different potential applications, but the fishery is one that first came to mind, and, in this framework, you've got a resource that you're allocating, and the resource can be heterogeneous, and so it can have many different characteristics, and it can be different in different locations or different points in time, and then you have different individuals, and you are trying to allocate the resource to the individuals, and the individuals can be heterogeneous.

They can have different costs of allocating the resource to different places or different times, and they can have different benefits from giving the resource to different places and different times, and the algorithm is an iterative process that goes through allocating different shares of the resource to the different individuals, and it's a bidding process. For the individuals, it's actually participatory. The stakeholders participate in the process, and, at each round of the algorithm, the participants put in bids for different shares or different locations, different parts of the resource, and they go -- It's an iterative process.

You put in a bid, and you go through some calculations, which allocates the resource, and the stakeholders put in another bid, and then it's reallocated, and so on, and it goes to -- The iterative process continues, and, in the end, you end up with an allocation that's both efficient and maximizes the value of the resource and it's also fair and equitable, in the sense of non-envy, in the sense that no fisherman would want to trade his or her allocation and costs with any other fisherman, and so it's pretty cool. I mean, it's got some potential advantages.

Another interesting thing about this method is you can also add to the method any ad hoc restrictions that you think are important to the situation, and so, for example, if you needed to add an ad hoc restriction that no individual fisherman or sector's allocation was above some cap, that could be added, or no sector's allocation was below, below some minimum level, and you could add that, or that no sector's allocation got above a certain percentage, and so you could add any ad hoc restrictions.

What the algorithm does is, subject to those ad hoc restrictions, it makes the allocation as efficient as it can be, subject to those restrictions, and also fair, equitable, in the sense that no one would want to trade his or her allocation with anyone else, and so one thing that the algorithm needs though is that the stakeholders need to be able to put in bids in order for different allocation shares or different amounts of allocation in different regions or areas or points in time, but there might be different ways we could think about how to operationalize that.

Anyway, I will put that out there, and I've got like a reference list to some public choice literature and some of the papers and books that show different methods of trying to get at equity and fairness and including that in economic analysis, and then this particular method that I've kind of focused on, to me, seems to be the most relevant out of all the methods that I've reviewed so far as being appropriate sort of in a fisheries context. I will stop there. Thanks.

DR. CROSSON: Chris, I've looked at this before, and then I forget about it again, and, after I don't look at something for a while, it just escapes my brain, but this is in terms of -- This is basically an argument for Pareto efficiency?

DR. DUMAS: Yes, and so the algorithm achieves Pareto efficiency and fairness, in the sense of non-envy, non-envy criteria, which is that no individual would want to exchange the benefits and costs of their allocation with any other individual's allocation, and so no one envies anyone else, and so everyone is happy with what they get relative to exchanging it with someone else for what the other person got, and so that's one way of defining fairness and equity, is the non-envy criteria.

I have presented this at AFS, and I've presented it at the Southern Econ meetings, a couple of times, but it's so different, and I think it's so new, and I haven't seen any application of this method in the natural resource economics literature, and I've got to search that, and so it's applied some in the public choice literature to different situations, but it's the first time I have seen it in the -- I've been working on a paper to send to *Marine Resource Econ* or something, because I think it could potentially be useful.

I originally came upon this method, and there was an article in the *New York Times* that was talking about using this method for allocating an apartment. If you have an apartment with four rooms, and there is four roommates, and you're trying to decide how to allocate the four rooms to the four roommates in a way that's both efficient and fair, and the rooms have different characteristics.

One has a bathroom, and one has a bigger closet or whatever, and the four roommates like different things. They have different preferences, and so how do you -- There's a total rent that needs to be paid for the room, and you have to figure out what share of the rent should be paid by each roommate.

The problem is allocate the four rooms to the four roommates in a way that both gets maximum value from the rooms, and so that's efficiency, but, also, it allocates the rent shares among the individuals, but then you also end up with an allocation of rooms and rent shares that's fair, in the sense that no roommate would want to trade his room and his rent share for the room and rent share that any other roommate gets.

DR. WATERS: Can this approach be scaled up from four people to 4,000 people?

DR. DUMAS: Yes, it does. It scales up to any number of people.

DR. CROSSON: How about when the apartment is free, and nobody is paying rent, and you still have to figure out how to divvy up the rooms?

DR. DUMAS: Right, and so there were different ways of doing that, and so there are different ways of operationalizing the general algorithm, and so it works for when the resources are good, like the rooms, and you're trying to allocate the rooms, the shares of the good, to individuals, and it also works when the resources are bad, something that you have to allocate bad things to individuals, and so like chores.

Like there's different chores that need to be done in the apartment. There are different chores, and the four roommates have to do the chores, and you're trying to figure out which roommate should be assigned which chores, and you want to do that in an efficient and fair way, and the roommates have different abilities, in terms of their ability to do the chores, and they have different preferences, in terms of which chores they like and dislike, and then the roommates submit -- They're submitting bids to avoid during certain chores, and so it's sort of the same process, but everything is -- Just put a negative sign in front of everything, and it runs through the same algorithm. It works for that, too.

I mean, it's very general, and it can include a lot of different -- Both good and bad, and it can include ad hoc restrictions that need to be added on for various reasons, and it achieves both efficiency and fairness, and here's another thing. You don't have to know -- You don't have to know the preferences of the individuals. Through the bids that they submit, they reveal their preferences, and so you don't have to know each individual likes or dislikes.

You wouldn't have to ask the fishermen what they like or dislike or what their costs are, even if they know what their costs are, or the benefits of different things, because the fishermen reveal that through the iterative process, through the bidding process, and you don't have to know all the characteristics of the resource. That can be based on the fishermen's knowledge, and so the fishermen are submitting bids based on their own private knowledge, and you don't need to know. You just need to know what your resource is that you're trying to allocate, that you're trying to provide.

This particular mechanism may or may not work in the end for this, but I think there could be a lot of insight gained for looking at it and thinking about either how to apply it in some modified form or thinking about the methods that were used to develop it to develop a method that would be appropriate for the allocation issues that the council is considering.

DR. WHITEHEAD: I have a question for Chris. You're talking about bids, and how is this different than an ITQ?

DR. DUMAS: Because not only does it give you efficiency, but it also gives you equity, fairness, in terms of non-envy. It's similar to an ITQ, but it also achieves the equity fairness goal, in addition to the Pareto efficiency goal.

DR. WATERS: Following up on John's question, how would this differ from an auction process for an ITQ fishery?

DR. DUMAS: Because, with an auction, you get efficiency, but you don't necessarily fairness. You don't necessarily get non-envy in the end. Those who don't win the auction may envy those who do, in the sense that they would want to trade places with them after the auction is over, or maybe not, but those auction mechanisms, as far as I know, what I know of the auction literature, which is not the most up to date, but, as far as I know, the auction stuff does not give you equity. It doesn't give you fairness. It just gives you efficiency.

I have actually been teaching this to my masters, and even to my undergrad students, teaching them the method. In my classes, I've got a couple of examples that are very practical, very limited examples that kind of give the flavor of the method, and I've got the apartment example, where you've got four roommates and four bedrooms, and it kind of goes through the calculations of the algorithm, and it shows how the allocation process works, and the mechanism doesn't actually require any kind of crazy calculus or matrix algebra or anything, and it's just adding and subtracting and going through the algorithm, and so it's very much like a computer algorithm rather than an analytical method.

I've got the apartment example, and I've also got a fisheries example, where you've got a fishery resource, and you've got four different fishing areas, and you've got four different fishermen, and you're trying to allocate the fishing areas to the fishermen, and, in that example, they're fishing areas, but they could be -- Instead of fishing areas, they could be different quantities of catch. You could take the total allocation and divide it in four parts, or divide it into any number of parts, in terms of pounds of landings, and the fishermen are bidding for the right to harvest those different catch bundles, or landings bundles, and that works for that, also. If anybody would like to see that, I could forward that, and it kind of explains -- It's a little example.

DR. CROSSON: We'll take a look at it, and I think we should definitely put something in there about Pareto efficiency and how you can try and move towards a system where groups are at least somewhat satisfied with their current allocation, what they have right now, and we'll have to see that. If you could write that down briefly as a -- Write it up, but I just have to -- You have mentioned this thing before, but I have to see this, and I think I have some questions about it.

DR. DUMAS: It's already written up, and I've got examples, and I can send it, but just in general for you guys to write down, for staff to look at, the topics in public choice literature are fair division

problems, and that's the name of the general topics of fair division problems, and one example is the cake cutting problem, and that's one that people have known about, but this method that I'm talking about is different from -- A lot of those things gets you fairness, but not necessarily efficiency, and so that literature is different. This is the only one that I have -- This is the method that I've found that's closest to the fisheries problem, the fisheries allocation problem, but, anyway, I've got a --

DR. WHITEHEAD: What are the chances that you can get this published in the peer-reviewed literature before the process that John Hadley described is completed?

DR. DUMAS: That would depend on the charity of the reviewers.

DR. WHITEHEAD: Have you submitted it?

DR. DUMAS: No, not yet. They're working on it, and I've presented it at conferences.

DR. WHITEHEAD: I think that would help to get the attention of the council.

DR. DUMAS: Yes, that's the plan, and I just wanted to mention it here, but just to let you guys know that there is stuff out there to help you look at the equity fairness side, in addition to the efficiency side, and so, if the SEP wants to limit our comments just to issues related to efficiency, that's fine, and I just wanted to put it out there that there are some methods that might be useful to help address the fairness and equity side, also.

DR. WHITEHEAD: I don't think we want to limit our attention to efficiency, but I did not hear that word mentioned during the allocation presentation, and I don't know if the Allocation Committee has rejected efficiency or not, and so we definitely don't want to just focus on efficiency.

DR. YANDLE: First of all, I really loved Chris's discussion, this modeling approach that he's working up, and I think you and I talked about this before, and I just find it absolutely fascinating, and I hope we can introduce some of that into this, but, just more generally, I think we may need -- Let's be careful about how we're using the term "efficiency" and be really careful to define it, because I think it means something different more positive to us economically-oriented people in the room compared to what it probably means to the council. Some of the things that Scott was saying earlier about it means better consumer surplus and this and that, and this is why it's good, I think we need to give them a little bit almost of a 101 on that, as part of the notes that go back, and please don't tell me that I just volunteered to do that.

DR. WHITEHEAD: I would be happy to do that, since I can go back in my notes, and I think we sent that to them before.

DR. YANDLE: Perfect.

MS. WIEGAND: Scott, if I can jump in here real quick, Steve Poland, one of our council members who is on the webinar, did just send a message making a note that efficiency is something that the council has to consider as part of the National Standards, and it just can't be the sole reason for a particular allocation, but it is something that needs to be considered, and so, while it didn't make

the specific list that I brought up, it is something that the council will be considering as they go through the allocations process.

DR. CROSSON: Let me add too, and I don't think there's anything -- If Steve wants to talk to us for a minute, I'm all ears, if he's volunteering to do that, but I think it would be helpful for us to hear from him, if he's willing to, about what the council is looking for.

MS. WIEGAND: Steve, I don't want to put you on the spot, but I did unmute you, if you can add any information.

MR. POLAND: Thank you. I mean, I don't have a lot to add, but I just wanted to point out that National Standard 5 does require us to consider efficiency, and it doesn't really define what that efficiency is, and I think Tracy was really hitting that, and as far as, a lot of times, in a fisheries management context, efficiency could mean a lot of things, and, a lot of times, we talk about it around the council table as more efficiency in certain types or gears or extraction rates or like that, and not necessarily from an economic perspective, but, in something like allocations, my personal belief is that social and economic factors are probably the most important things to consider when determining how to divvy up the pie.

Chris used the example of assigning rooms in an apartment, and, I mean, I think that fits what we try to do fairly well, and I just like the efficiency discussion, and I don't want you guys to feel like that's the only thing that we will consider or that we'll discard it because it's more of a standard economic approach.

DR. CROSSON: Are you guys ready to move on and talk a little bit -- I mean, we can come back to this, but maybe we can go a little bit further in and talk about the second question about approaches for conducting social analysis of allocations.

MS. WIEGAND: Just to add a little bit here, for amendments, we typically use the standard social approach of looking at commercial and recreational engagement and looking at the regional and local quotients, which I know I have gone over with this committee in the past, and there have been some concerns expressed about perhaps other information that should be included with that, and so, like John Hadley said a little bit ago, we're really looking for some out-of-the-box approaches to social analysis and things that maybe we haven't considered in the past that might lend themselves well to allocations.

DR. YANDLE: The first thing I'm thinking about is it really depends how deep of a dive you want to get and how into the weeds you want to get with this stuff, and so the obvious one that we're all aware of, as far as not getting too into the weeds, would be those community profiles and the relative dependencies for various geographic areas, and I think they've got it between, and Jen might know this more than me, between sectors as well for the different communities, and there could be -- Sort of at the lighter level, you can get your sort of thirty-thousand-foot level information with what they've worked on there, sort of combing the census and some other data.

Then, once you get beyond that, it's really how much those sort of reports we've been working on with the advisory panels and how you work on institutionalizing those, and, long-term, those could start becoming a resource for you, and then, after that, I'm sure there's opportunities to go into the

oral histories and surveys and a lot more labor-intensive effort, but it's just a matter of how much resources and time you want to throw at it.

MS. WIEGAND: Well, and I think that's a good point to bring up. We're in a little bit of a different situation now than we were back in 2012, when they were working on the Comprehensive ACL Amendment, where we're not under the same sort of time constraint now that we would have been back then, and that's not to say that the council is going to want to endeavor on getting into some type of social analysis that may take a years to get finished, but I do think we have a little bit more leniency, in terms of the amount of time we can spend doing some of these analysis, then we would have back in 2012.

DR. WATERS: I would just like to note that the suggestion described by Chris would span both the economic and the social perspectives.

DR. SWEENEY-TOOKES: I had a thought as you were talking about this earlier, and, in fact, I shot off an article to you, Christina, but trying to make these choices going forward and gathering data going forward, especially in the Georgia case, and that's where I can really speak to, these communities are hardly fin-fishing at all anymore, because of past regulatory decisions, and so I almost feel like we're trying to catch the horse that's been gone out of his barn for a few years now, and so we might really need to go back, like Tracy was saying, to those original community profiles and to oral histories, because I don't know that there's really any contemporary qualitative data, at least from Georgia, about what sort of impact these would have on fisheries now.

MS. WIEGAND: I did get that email that you sent, Jennifer, and thank you for sending that along. I appreciate it.

DR. SWEENEY-TOOKES: Absolutely.

DR. YANDLE: Just thinking out loud here, I am also wondering -- I am remembering, a few years ago, those efforts that you were doing sort of with the outreach, and really trying to bring sort of more people from the community than would normally show up for say APs together and doing sort of some of those guided discussions and notetaking and all that. I wonder if intensified efforts sort of focused on some relatively specific questions could be a more time-efficient way of gathering some of this qualitative information and even possibly quantifying some of it, making some trips actually down to the coast to key geographic areas and trying to have these discussions, and so that might work, but that's going to, again, be a fair amount of effort on you guys part.

DR. CROSSON: This is good, and some of this is bleeding into the third question, and so some of the things you've mentioned. The third question is about what data sources are available for conducting analysis, and some of those are ones you just mentioned. Obviously, we have the -- For the economics side, we have Chris Liese's reports that he just showed us, that kind of stuff for measuring profitability, and maybe even approximating rents in the commercial sector, and, on the recreational sector, there is quite a bit of literature that's out there, including by some of the people here, about consumer surplus and willingness to pay estimates for the recreational sector. Is there anything else? I mean, we didn't mention I-O modeling, and does anybody think that's important for this stuff?

DR. WHITEHEAD: In terms of efficiency, and I think Chris Dumas should talk after I do, that it seems like, when you only consider the dockside price, the -- I won't say -- The allocations are always favoring recreational fishing, but that doesn't capture the value of the commercial catch down the supply chain, and so I have not seen studies that have captured that, and that doesn't mean that they're not out there, but I think the I-O stuff is important for efficiency and for some measure of equity. Let me say I-O in industrial organization, and, when Scott mentioned that, I was thinking of economic impact analyses.

DR. WATERS: I am not altogether satisfied with using I-O models to determine allocation, because they tend to be linear in nature, which means that the marginal benefits of a larger allocation are constant, and the marginal costs of the smaller allocation are constant, and the mathematical implication of all of that is 100 percent of the available quota would go to just one sector.

DR. CROSSON: That's a really good point, and I'm writing that down, and we'll definitely make sure that we put that in the notes.

DR. DUMAS: Following up on what John Whitehead said, we're working on a study right now, and John is part of the study, in North Carolina, where we're looking at tracing, for the commercial fisheries, tracing the fish as they go through the processing and distribution chain, to try to gather information we would need to sort of capture the value of the commercially-landed fish as they go through the whole distribution chain, and, traditionally, we've used I-O models to look at economic impacts of commercially, and recreationally, landed fish on the supply chain, and this is the supply and support, both recreational and commercial fisheries, and I-O analysis has been used for that, and I-O meaning input-output analysis, economic impact models, but it's not used as much for the distribution chain.

After the fish is caught, it goes through processing and packing and transportation and warehousing and wholesale and retail, looking all the, potentially, economic value that is created there to the economists, in terms of producer and surplus and all those different levels. There have been different models that have looked at are there ways to capture all of that downstream producer surplus at one stage of the market, at one stage of the distribution chain, and sometimes at some market conditions that's true, but, in other conditions, it's not, and you have to get to get the detail and all the stages of the distribution chain. In any case, we're getting that for North Carolina in the study we're doing now, and so, hopefully, we'll be able to answer that.

To Jim Waters' point, I agree with him that input-output models are linear and have the problem that Jim identified, but, if we could capture the impacts on the recreational and commercial fishermen themselves, through other types of models, then, as far as all the economic ripple effects in the economy, the multiplier effects of the suppliers and the distribution chain, those effects might well be relatively linear, and so those may be problem, and I agree with Jim that the initial effects on the commercial fishermen and recreational fishermen themselves are probably non-linear, but maybe one of the multiplier ripple effects on down the distribution supply chains could be linear, and so input-output models, I-O models, could be useful in capturing some of those.

I would just like to further point out that, if that were not the case, if there are some non-linearities in those distribution chain and supply chain effects, then there are other types of models called CGE models, computable general equilibrium models, that are like I-O models, but they add non-

linearities to the models in those places where the non-linearities are significant. Generally, CGE models are regional. There have been some built at a national level, but those would be less relevant, because they wouldn't have the detail that we would need sort of at a regional level.

There are some CGE models that are built for different states and for different regions, and usually most state universities have someone who can do CGE modeling, and so there may be some existing CGE models for our region, and I don't know, but, essentially, they're doing the same thing that an I-O, an input-output, model does. They're just adding some non-linearities in key places where those are important, but, looking towards the future, that would be an option, if we needed that and if it was useful and relevant in the future. Thanks.

Also, I just sent a couple of articles about the allocation method that tries to achieve both efficiency and equity. I sent a copy of those to Scott Crosson, and then he can forward those to the rest of the committee, for you guys to review later if you want, and there are references in there too, and it's just some of the key papers and books in the literature on equity. Thanks.

DR. CROSSON: All right. Tracy and Jennifer mentioned some different social sources in the previous items, and so I think we have a lot of that, and I don't know that there's anything missing there that you guys want to add. John and Christina, what factors should the council take into account, what does that mean, what factors? We're discussing social and economic factors.

MS. WIEGAND: As part of the Modern Fish Act, the council had to come up with an allocation trigger policy that basically says, once these triggers are met, we will review allocations. Just because they review them, it doesn't mean that they necessarily have to choose to reallocate, but they do have to review the allocation, and so this question is getting at, once one of those triggers has been met and it's time to review whether or not there needs to be a reallocation, what factors should the council consider when making that determination.

DR. CROSSON: I mean, an obvious one is if one sector or another is continuously not making -- Not landing its portion of the existing allocation, and that's one potential problem, and I don't think that's particularly innovative, but that's something to take into account, especially if the other one is.

DR. WATERS: I would like to suggest something a little bit different, and it's a qualitative approach, and these allocations represent constraints on a sector's ability to land fish, and, if you tried to model this process mathematically, there would be an implied shadow price that represents the marginal value of an additional pound of fish or the value of an additional day of fishing if that sector had a slightly larger allocation, and so reallocation would suggest a movement towards -- I guess, ideally, you would reallocate until each sector had approximately the same value of an additional day that it could fish, and I'm wondering if one possible indicator of differences in the shadow prices might be the hypothetical length of a fishing season that might result if some of our management measures, such as trip limits and bag limits, did not exist, and so, if one sector had a really short hypothetical season, and the other sector had a really long hypothetical season, this might indicate that the sector with a short season really could use some extra fish.

At any rate, there is no reason to believe that an equal length of season would yield maximum economic value, but economic efficiency is not the only objective to consider in the allocation, and allocation that might equalize hypothetical season length might satisfy each sector's sense of

equity and fairness in the allocation process, and so I just thought I would throw that out and see what you all think.

DR. CROSSON: I think that's good, Jim. I like that, because the inverse of it is just that, even if you did a massive reallocation from one sector to the other, you might result in a very small change in their season, especially for the recreational sector. Just allocating a bunch more pounds to the sector might not increase its season by a significant amount.

DR. SWEENEY-TOOKES: I would like to echo that. I think that's a great approach, and I think that that will not only economically, but almost psychologically, sort of make the whole system more equitable for commercial.

DR. DUMAS: To follow up on Jim Waters' remarks, to look at sort of practical examples of implementing something like that using information on constraints and shadow prices to allocate more efficiently, there is the economics literature on groundwater allocation and irrigation water allocation from rivers, especially out in California and the west, that would provide examples, practical examples, of taking a resource, for example a groundwater pool, and allocating it among a number of different users when there are additional other constraints on the allocation, and those methods use shadow prices, just as Jim was suggesting.

Also, there has been some literature looking at the actual implementation of some of those methods and how they actually worked out in practice. Now, those methods try to get at efficiency, and I can't remember to what extent they address fairness, other than in an ad hoc way, but there might be some lessons learned there, if the staff has not already looked at that, and so that would be the water allocation literature for groundwater and surface water allocation out in California and Arizona and New Mexico and those places where water use, in agriculture in particular, allocation, that might be useful. Thanks.

DR. CROSSON: Okay. If we don't have anything additional for that, then the last one is always an interesting question. How should this be presented to the council, any of this information?

DR. DUMAS: I think it would be useful -- I think the council is familiar sort of with efficiency as a concept and trying to allocate fisheries efficiently, and maybe to sort of review that with the council, sort of how economists think about efficiency and sort of practical rules of thumb to use to determine whether you have efficiency would be useful.

Also, I think having a discussion with the council about constraints, different types of constraints, like bag limits, but other different types of season limits and other different types of constraints, and how those things generally interact with efficiency and then also fairness, equity, and several of the different major ways that economists and political scientists and public choice people have thought about fairness and equity and different ways of measuring that or conceptualizing that, just in general, just in words and not in math, might help the council kind of think through some of these things and how sort of efficiency constraints and equity -- How those three things relate to one another and how some of the concepts and ideas that come from the relevant literature has helped them think through some of these things and conceptualize these things might be useful.

Sort of a presentation that briefly reviews efficiency, but then also kind of spend a little time talking about concepts and principles from the idea of constraints and getting at the idea of shadow values,

without maybe even using that term, but getting at that idea, and then, also, the idea of how to think about equity and fairness and different ways that people have thought about trying to implement those ideas. Thanks.

DR. CROSSON: Are there other comments?

DR. MURRAY: This is probably a dumb idea, but I'm going to throw it out there anyway. When we were talking about Chris's apartment example, and Scott pointed out how does this work if the apartment is free, Chris said, well, you have an example where chores work, and that example, I think, is somewhat compelling to the overarching problem of allocation here, in that there may be sort of non-simple cost versions of mechanisms that lead to fair and efficient allocations, and so just presenting that example in some easy-to-describe way to the council might have some value, and, again, that's probably not a good idea, and so I'm going to shut up now.

MS. WIEGAND: I actually think that's a fantastic idea. We've been using examples like cutting a cake to describe how the MRIP revisions may impact allocations, and I know, for me personally, someone who is not very well versed in modeling, a simple example, like an apartment and allocating rooms if no one is paying rent, really helps illustrate what we're talking about, and so I think that is actually an excellent suggestion.

DR. WATERS: I would like to add that this fishery management in general, and the allocation problem in particular, has many different objectives. There are many different perspectives to look at the issue, and there is a whole list of them in the presentation that we heard earlier on. If we try to get too quantitative about this thing, I think that tries to make the whole problem of allocation sort of an automatic technical thing, and I think we ought not to rely too much on that automatic approach. We ought to keep it a little bit general, so that you can take into account all of these qualitative objectives without having to rely on some formula telling you what the overall answer is.

MS. WIEGAND: Absolutely, and I think that's something that we would like to keep in mind, and one of the things that I personally have struggled with is how to explain to the council or how to illustrate some of these more value-based criteria that I think can seem a little obtuse sometimes, and how do we get from these values that we're identifying to a concrete allocation, and I feel like that can seem like a big jump, and so, if you all have any suggestions on how to guide the council or illustrate how these more qualitative value-based ideas can eventually make it to concrete allocations, that would be very helpful, because I know I've struggled with how to communicate that or illustrate that in a way that doesn't seem sort of very high level and hard to wrap your mind around.

DR. YANDLE: Can you give us a such-as?

MS. WIEGAND: Such as -- Let me scroll back in the presentation here. How do we take this idea of cultural importance of a species, how do we take that and use it to determine how we should allocate a fishery?

DR. WATERS: I am glad you scrolled to this particular slide. If you could, in a very qualitative sense, identify some advantages and disadvantages, or benefits and costs, associated with some of the more important factors that you have listed here, I think that would help to focus the council's

thinking on how it wants to allocate, and so, if you looked at cultural importance of a species, for example, if you can identify somewhat, in a very qualitative sense, what some of the benefits of considering that criterion in the decision would be, or some of the -- Anyway, just focus on the benefits, and then people can weigh the different benefits across these different criteria, and I think that would help to focus their thinking and perhaps arrive at a really good solution for the allocation issue.

DR. YANDLE: Using that cultural importance one, it also may be one where, if you have examples, and like I'm making one up now. Say this particular geographic area, or sub-part of the community, holds this particular fish really important for this area, and they're not going out and catching it so much, but they're relying on it being caught, and then they're buying it in the stores for X, Y, Z celebration or holiday or whatever, and that might be an indication of, okay, so, therefore, there's a cultural importance to this species being caught commercially, whereas, in another community, one of the things that people always do and always talk about is having memories of going out and catching this other species with their dad.

Then that's a different type of cultural importance, and you could have some of the qualitative data to show these usages, and that could be just things that came up in your focus grouping, or it could be you're pulling it out of oral histories, or it could come from any number of sources, and Jen probably can say a lot more about this more eloquently than I can.

DR. SWEENEY-TOOKES: No, I think you nailed it, Tracy. The only thing I'm sitting here thinking is that, unfortunately, at least in my experience, we often don't realize the cultural importance of something until we don't have access to it anymore, and so, trying to think about how to get people to pinpoint specifically which species they really care about before allocations impact them, that's going to be the tricky task.

DR. YANDLE: Just a totally random example for you is I'm actually following, on Facebook, a whole lot of the low country fish stores and fishermen and that kind of thing, and you see a lot of discussion ensue around, right before Christmas, the Festival of Seven Fishes, and it's like I had no idea that people were still doing that, but they are, and so that kind of thing.

DR. DUMAS: I've got a question for the other panel members, and that is so we -- There are a lot of studies that attempt to measure the consumer surplus, the recreation value, or willingness-to-pay value, to the recreational fishermen of a recreational fishing trip, and what about -- Are you guys aware of any studies that try to measure the consumer surplus, the willingness-to-pay value, to a commercial fisherman of a commercial fishing trip?

We know that a commercial fisherman receives producer surplus value from a commercial fishing trip, but, in terms of sort of the cultural heritage or lifestyle value of commercial fishing to the commercial fishermen, in a sense, it seems like that would be captured in the consumer surplus value to the commercial fishermen of a commercial fishing trip, and it seems like a pretty obvious and straightforward type of study to conceptualize and to attempt, and are you guys aware of any studies like that that have been done in the fisheries economics literature?

DR. WHITEHEAD: Chris, I've seen some stuff I think on subsistence in like remote Pacific Islands, when you're comparing like fishing days versus farming days, that would vaguely get at that, but I don't think I've seen it in the relevant context.

DR. DUMAS: I've seen studies looking also at your next best job that you could have if you were a commercial fisherman and that type of thing, and I've seen those types of studies in, for example, the U.S., but I have not seen -- I can't recall, but I haven't done a literature search to look for this. If it hasn't been done, this would be a great thing to do, but what's the consumer surplus value to a commercial fisherman of a commercial fishing trip?

This would be sort of the commercial fisherman's enjoyment value of the commercial fishing trip, above and beyond any sort of net revenue value that he obtained from the commercial fishing trip, of what's the consumer surplus value, the enjoyment value of that commercial fishing trip, to the commercial fisherman.

It seems like that could capture some of the cultural importance and value, at least to the commercial fishermen, and it might not pick up the cultural importance of commercial fishermen to other members of the fishing community who are not fishermen, people who live in the coastal towns and things, the cultural importance to them, although, potentially, we could get at that through sort of a willingness-to-pay-type studies, stated preference things, and perhaps John Whitehead would know much more about that than I do, and there may be some studies with that already, what are the values to community members, non-market-value community members, of the commercial fishing activity occurring in their community, what's the non-market value of that, and there may already be studies of that, and John Whitehead would probably know. John, do you have any knowledge of things like that?

MS. WIEGAND: I see Brian has his hand up, and I think he might want to jump in here and add something. Brian, I'm going to go ahead and unmute you.

DR. CHEUVRONT: This is an interesting discussion. In socioeconomic surveys that were done by DMF, going back nearly twenty years now, they have been collecting this kind of information, but not in a consumer surplus context specifically, but they had been asking commercial fishermen about quality-of-life issues and other things that they might be doing, what is the importance of commercial fishing to them, and why are they commercial fishermen, things like that, as opposed to doing something else.

Scott probably can jump in on this, because he took all that over after I stopped doing it, but there was a lot of data, but it just wasn't done in a consumer surplus context, which is like, now I'm hearing this conversation, and it's like, wow, why didn't we do that that way, because what a great framework to hang that in, but there is a lot of data that North Carolina, at least, has on their commercial fishermen, collecting that kind of data, and a lot of it is longitudinal, for some of those people going back and asking the same questions multiple times at roughly five-year intervals, and so I don't know. Scott, I guess I would see if you would want to elaborate on that.

DR. CROSSON: I took that dataset, and there was an article that I published, and it was North-Carolina-specific, but I published it in *Society of Natural Resources*. I did a regression, looking at entry and exit decisions, and I included some of those different social variables that were in the DMF surveys, and family history came out as really important, and I remember that. Your willingness to stick in a fishery was much stronger if you had a family history of commercial fishing.

Richard Pollnac has done a bunch of stuff on fishermen's job satisfaction, and a lot of it relates to commercial fishing overall and not specific species, but there is literature, and, if you start with Pollnac, you will a lot of stuff from him about job satisfaction, and a lot of it is in the Northeast. I think I'm the only one that -- One of the few people that has done anything in the Southeast for this, but that's an area to look at.

DR. DUMAS: John Whitehead, have you seen anything on the consumer surplus value to commercial fishermen of a commercial fishing trip, if you have run across -- Or Tracy, maybe.

DR. WHITEHEAD: I have not, no.

DR. YANDLE: I haven't seen anything with the terms you're using. The closest I am thinking about is Scott's and the old -- Bonnie McCay's old work looking at status and what motivated fishermen up in the Northeast. It's one of those understudied fields.

DR. DUMAS: If we have not seen something like that, if we could do a quick lit search and see if something like that exists, but it seems like, if we could -- If we had something like the consumer surplus value to commercial fishermen of a commercial fishing trip, that would help us compare that type of enjoyment cultural value of commercial fishermen relative to the consumer surplus value to recreational fishermen of their recreational trips, and it might help us more compare apples to apples, or comparing commercial to recreational fishing, and the consumer surplus to a commercial fisherman of a commercial fishing trip may not capture all of the cultural importance in other types of qualitative issues that are important and should be considered by the council, but it might capture some of it, some of that, at least to the commercial fishermen themselves, and it would sort of help everyone involved in the situation compare those types of enjoyment -- The enjoyment value of fishing and the unique aspects of fishing and how those would be of value to the fishing participants, help us compare that across commercial and recreational fishermen on a more equal basis, a more comparable basis.

DR. CROSSON: Chris, I'm thinking about this operationally. If you're commercially fishing, and you're choosing to do this to make money, there are opportunity costs that you conceivably have, and we've never had a great -- We know a lot of guys that will go hammer nails and do construction, especially in coastal towns, when the weather permits, but there are certain opportunity costs for going commercial fishing, things you could be doing otherwise that are more profitable, but you choose to do it, and so it would be -- Once you account for these opportunity costs, then whatever remains is probably the way that you could conceptually measure that, and does that make sense?

DR. DUMAS: Yes, but I'm thinking sort of more generally, in the same way that we try to measure consumer surplus value for recreational fishermen, and they're both revealed preference methods, and they're stated preference methods, and John Whitehead is an expert at actually combining revealed preference and stated preference methods and ways to try to estimate that willingness-to-pay, that consumer surplus value, and so I'm thinking some of the same methods that have been applied to recreational fishermen -- Let's think about how to apply them, as much as possible, in the same ways to commercial fishermen, in terms of revealed and stated preference methods, and think about how can we apply those methods that have been used for recreational fishing to commercial fishing in ways that are as close as possible to the ways we've done it for recreational

fishermen, and they might have to be modified somewhat for commercial fishing, and I'm not sure.

I mean, I've had that thought before in the past, what's the commercial -- What's the consumer surplus value to the commercial fishermen of commercial fishing, and I've had that thought for a while now, but I haven't allocated time to really pursue that, but we've got John Whitehead, and he's, in my opinion, one of the national experts on doing that type of thing, and so he might have some comments or thoughts about how that could be operationalized in way that would produce results and be most comparable to the results we get out of recreational, consumer surplus in recreational, fishing.

DR. WHITEHEAD: I do have some thoughts, but I don't know how practical that would be for the South Atlantic Council.

DR. DUMAS: Looking to the future, those might be some really -- If we could think of a way to operationalize the revealed preference and stated preference studies, to try to estimate the consumer surplus to commercial fishermen of commercial fishing, that might be some really useful information that could help capture some of the heretofore unquantified value to the commercial fishermen of participating in commercial fishing.

DR. CROSSON: If we're done with this, there is one other thing that I wanted to bring up with the Socioeconomic Panel, and it's that question that I sent out in an email, that, because of the MRIP revisions, there are significant shifts that are potentially underway between the recreational and the commercial sector, which is going to change the selectivity, which means it will change the ABC recommendations, and you have more than one variable moving at the same time, and are there any thoughts from the panel about how that might be addressed in doing analysis for this stuff? It's a very technical question. Basically, the decision about how to divide the pie changes the size of the pie at the same time.

DR. DUMAS: On that issue, I have a question for Jim Waters. Jim, would your model that you had built in the past -- I'm pretty sure that had selectivity in it, and could that -- Could you model be used to help answer that question?

DR. YANDLE: This is maybe taking us way back to basics, but, going back to the pie analogy, is there any reason to think that we always want to maximize the size of the pie before we think about the allocation, or vice versa? Is there one of these that we would particularly want prioritized for any reason?

DR. CROSSON: Tracy, that's one factor that also popped into my head, because I had this discussion with the Regional Office, with Steve Holliman, before he retired, and it was about this -- Recreational fishing, for a lot of species, you don't necessarily want to optimize yield, in terms of MSY. They may want to value other things, like encounter rates, at a higher number, and so they may not want to fish all of their allocation if they think that the encounter rate is higher than it would be fishing at MSY. Now, of course, both sectors are fishing the same stock, and so that gets a little bit more complex, but that's something that always has to be accounted for.

DR. YANDLE: So it is possible then to have a situation in which not -- First of all, there is the obvious, in terms of sheer volume, and there is occasions where a smaller piece of a larger pie is

going to get you more, is one observation. Then the second is off of what you said. Often, they would rather get either the same absolute amount of pie or less, if it means that they know there is more pie out there, just stretching this analogy to the breaking point and beyond. Is that accurate?

DR. CROSSON: I think that's a funny way of putting it, but you're more likely to get more pie tomorrow if you don't take a bigger slice today.

DR. YANDLE: That's another sort of one of those fundamentals of there will be bigger pie tomorrow than today, and then -- Yes. Then what exactly are you asking us to provide some advice on here? Is it pointing out all the different permutations and combinations in which the pies can change, or are we just wanting to make a more general statement of don't always assume you have only got these two ways of looking at the pie?

DR. CROSSON: It was something to keep in mind. If we don't have any comments on it, then we don't have any comments on it. It's going to be something that the Beaufort is going to have to deal with this with their analysis. They have always just -- Because the shifts in allocation in the past have been relatively small, they have tended to ignore the changes, the effects of the changes, of selectivity on the recommendations that come out of the analysis, but now it actually is a factor. How much of a factor I think may be -- It may be like 5 to 10 percent in some species, and so it's still significant, but I don't know that it's an overwhelming factor, but, if we don't have anything to add to it, then that's fine, and we can leave it to the stock assessments.

DR. WATERS: The classic bioeconomic optimization problem includes both long-term allocation across years and short-term allocation among sectors within years. An increase in the size of the pie is talking about that longer-term allocation across years, and I think, from a practical point of view, we're just assuming that the pie is given to us -- The size of the pie is given to us by the biological stock assessment.

DR. CROSSON: Okay. If we don't have any further comments on this, that's fine. Is there anything else that we want to add to this discussion on allocation, or is there anything else that Christina and John would ask that we would be able to help with? Are the council staff satisfied with what we've done?

MS. WIEGAND: I won't speak for John, but I feel like this discussion has been incredibly helpful, and it has given staff both some new things to think about as well as some additional literature to look at, and so we really appreciate you guys taking the time to discuss this, and we certainly will be asking you for more in the future.

MR. HADLEY: I will mirror Christina's comments on that. Absolutely the same here. Then, as far as the question that Scott just asked, maybe -- We could always revisit it next year as well, if we have some concrete -- I should say not if, but as we get assessment outputs and that sort of thing, species-specific examples, and it may be a little bit more clear on how we may need to tackle those.

If I could, really quickly, I didn't want to disrupt the discussion, but just in how the -- This is more so probably in how the report is written, but, when we get into the discussion of economic data, I know that there's a pretty good kind of portrayal of the economic analysis and the data situation that we often face in the GAO report, which starts on page 33, and it kind of discusses the data

deficiencies that we can kind of face at times regarding efficiency analysis. Any sort of data streams, particularly on the consumer surplus side, either existing or directions we could go, and a lot of the discussion focused on that, but that's certainly helpful from a council staff perspective. That's all I have, and I just wanted to reiterate a thank you for the discussion.

DR. CROSSON: All right. At this point, what's the pleasure of the committee? Can we take a break for a couple of minutes and re-caffeinate and come back and just finish up, because I did want to talk briefly about the COVID thing, and I don't have too much to add, and it just depends. I probably can speak for less than five minutes about what NOAA is doing right now with the COVID situation in fisheries.

DR. WHITEHEAD: Can we take a break?

DR. CROSSON: Yes, let's take a break, and let's come back at 10:25.

(Whereupon, a recess was taken.)

DR. CROSSON: I am ready to restart, if you all are.

MR. HADLEY: That sounds good. Scott, should we jump into the discussion of the impacts of COVID-19 on the fishing industry? I don't know if you want to lead off with the Science Center's plans for that.

OTHER BUSINESS

DISCUSSION OF COVID-19 IMPACTS

DR. CROSSON: Okay, and so this is under Other Business, and, unless we have some other Other Business, I will discuss the virus and what's going on with us. I just saw John recently, and we were up in the Outer Banks at the beginning of last month for a lecture, and I guess that was the last big hurrah before everything kind of started closing down, and I got back, and they booted us out of the office pretty quickly, first voluntarily and then mandatory.

While all of that was going on, we were told -- I mean, everything is still fluid now, but this was just like two weeks ago, and we were told to get on the phone, all the NMFS economists from Alaska to Miami, and we were told to get on the phone with your contacts, as many as possible, that you feel, or at least as many as you feel are necessary to get a feel for what was happening with the industry, both commercial and charter, on the ground, and in terms of sales impact on businesses, whether restaurants are closed in that state or area yet, by state, and so on, and so we got that information.

Here in Miami, we called -- Several of us were on the phone for a couple of days, and I was on the phone with a lot of people down in the U.S. Virgin Islands, because we do a lot of work down there as well, and then we were able to -- Basically, the idea was -- This was before the CARES Act passed, and so we were trying to get the information to Congress as quickly as possible about how bad the situation was for the businesses at the moment.

Then the CARES Act passed, and there is \$300 million, I think is the number, that's in there for the fisheries relief in the short-term, and we also helped put together -- A bunch of the NMFS economists, including myself, put together a document for Congress explaining the status of the fishery, and that was given over to them. Anyway, there is \$300 million in the CARES Act, I guess, for commercial fisheries.

Now, how that gets divided up is now the new question, and we have not surveyed anybody recently, recently meaning the past week or two, and I was contacted by North Carolina DMF, and somebody was asking me from DMF about whether we were serving a written survey about the COVID impacts up there, and we are not, and I don't know who is doing that, but what we're doing right now is looking at already existing data, in terms of commercial landings, and whatever we have from the charter landings that we can estimate, and we're just using those existing data sources to try and get an idea for how important -- Not important, but just basically a percentage of how that might be divided up on a percentage basis.

We're looking at commercial fisheries, and we have an idea of how much charter fees are in particular states, and we've done an analysis of that before, and we have a tech memo for the whole Southeast, state-by-state, and we have information from MRIP and from the headboat program and all of those things about how many trips were taken over the past X number of years.

We have, of course, all of the trip ticket data from the states, and so we're taking all of that information and trying to come up with numbers state-by-state, and so that's where we're at right now, and we're not doing any new surveys at the moment. That probably will come down the pike. Normally, with hurricane disaster relief, which is the thing that we're most familiar with here in the Southeast, we would do a -- If an impact hits a state, like Florida gets hit by Michael or North Carolina gets hit by Florence, we work with our state partners, and we have Sea Grant and the state fisheries agencies, and we try to come up with a way of surveying people, to find out how bad their damage is to their equipment and to their product, and then we also look at past landings and try and get an idea of how much that was cut off, depending on the nature of the storm.

Then we put all of those together, and, normally, when that happens, those individual disaster reliefs are granted, and we have sixty days here in Miami to get together a report and get it to NOAA Headquarters, who then often takes its time and gets it to Congress. I think there's enough of a panic that probably the pedal is to the metal right now, and Headquarters will be a little faster than they often are with hurricanes, but I don't know how that money is going to get divided up.

I asked whether it was going to be given to the states, the way the hurricane money usually is, and then the states have to come up with a plan, and I asked whether that was going to happen, and I was told I don't know, and so it's still up in the air at the moment, but all I know is we're trying to get together those numbers, based off of the existing data sources we have, to Headquarters, so they can start figuring out what to do, and that's all I have at the moment.

MR. HADLEY: Thank you, Scott, and I certainly appreciate the update from the Science Center. From the council perspective, we have -- We came up with a very brief form that we've sent out to our APs, just to describe some of the impacts that they're seeing, as far as a slowdown in business, whether it be on the commercial side or the for-hire side or the tackle shops, those sort of business impacts and how it's affecting fishing.

At the same time, we have kind of had internal discussions amongst council staff on how we can better engage the APs, and I think that's really to be determined. As Scott mentioned, this is certainly a fluid process, and the impacts and effects are ongoing.

I think one of the concerns, from the council perspective, is that we don't want to over-survey or reach out too much, do more harm than good, so to speak, because I imagine that there's going to be a lot of outreach that goes along with this, particularly from the federal government, as well as academia and Sea Grant, and so several different organizations, and we really don't want to contribute to survey fatigue, particularly if those agencies are leading directly to aid for those that are in need, and so that's something that we're trying to keep in mind, and, really, this is about information sharing and updating the SEP on where the different groups stand.

However, if you have any input, whether it be now or down the road, on what we could do through our APs or through our fishermen contacts, as far as helpful information for agencies or academia, moving forward, we're certainly all ears, and so, with that, I will leave it there.

MS. WIEGAND: Just to add one more thing to what John said and sort of alluded to, we would also really like to make sure that we don't -- In addition to not causing survey fatigue, that we don't cause any confusion, given that fishermen are likely to be receiving surveys from a variety of sources, and we would like to make it clear that anything they fill out for us -- That the council itself can't request any aid, that that's not something we do, and that's something the agency does, and so that's another big concern, making sure we don't cause confusion among who they should be providing information to and whatnot.

DR. DUMAS: I just wanted to make a comment about an effort I saw at trying to ameliorate some of the negative impacts of COVID-19, and that is, in North Carolina here, our congressional representative has been sending out a newsletter every few days about COVID-19 and government programs to help small businesses with COVID-19, and I'm sure your legislators have been doing the same, but one thing that our legislator did was, because part of his district is one of rural farm areas, he put a list of direct links in his email to family farms that were selling directly to the public, either for pickup or for delivery of farm produce, and so members of the public could go to that farm and to their website, or call them, and schedule some pickup of local produce.

I went to some of those links, and they were all sold out. All of the farms had said that they were completely booked and sold out, and people that are sort of seeking ways to obtain food, but they don't have to go to the large supermarket and interact with a lot of other people, and so going to a local farm and interacting with maybe one person at a socially-appropriate distance seemed to be a popular thing.

I thought that doing a similar thing for our fishermen, those fishermen who might be willing to sell directly to the public, either for the public coming to pick up, or maybe even for the fishermen delivering in their local area, coastal areas, might be a very valuable thing to do, and so either ourselves or getting our representatives to send a similar list of fishermen in each local area who would be willing to sell fresh seafood, to the extent they have a dealer license and that type of thing, to the public, and that might really help out some of these fishermen, and it seems as if the public demand for that type of thing is really high right now, and the public is really seeking that out, and so I would just throw that out there as something -- I don't know exactly if that could be

implemented, or the best way, but it seems to be really working for local farmers, and so it might also work for our local fishermen here along the coast. Thanks.

DR. SWEENEY-TOOKES: I just wanted to add to that. We have a really active farmers market just in the small southern town where I am, but we are still close enough to the coast that we have one person who sells seafood, and they have moved their entire farmers market online, where people order and then they show up on a given day and time and pop their trunk, and all that food is placed in their trunk, because they do sort of a drive-by through a local parking lot.

We are seeing wild Georgia shrimp being sold there, and even whiting is being offered, which is not normally accessible up here, and it normally stays on the coast, and so the model is definitely in place and working, but I don't know what we would do to support that further as the SEP or council.

MR. HADLEY: I think that's useful input, as far as -- I'm not sure what we can do directly as the council, but that's information we could take back for our council members, particularly the state reps, and maybe they could filter it to somebody in the state, whether it be directly for their agency or other agencies, or at least it's good information to know going forward.

DR. DUMAS: As far as the economic impacts of the COVID-19, what about our state unemployment data? Those are updated relatively frequently, and I can't remember if we can pick out the industry, where each person who applies for unemployment -- Whether we have something like an SIC code, NAICS code, for the industry that they work in when they apply for unemployment, and maybe we could pick out fishing seafood industry people from the unemployment data, to get some relatively fast information on at least numbers of unemployed.

DR. CROSSON: The problem with that is that most of the fishermen in the Southeast are self-employed and not eligible for unemployment.

DR. YANDLE: Except they are now, but they may not know that.

DR. CROSSON: Okay.

DR. YANDLE: So, basically, what that means though is the fishing industry unemployment data pre-COVID and post-COVID is going to be completely incomparable, because, as you said, self-employed people weren't eligible until this latest bailout package, and so it's going to be a meaningless comparison. Sorry to just jump in on you there.

DR. CROSSON: No, that's useful, and thank you for reminding me. You told me that on the phone the other day, and I totally forgot about it.

DR. SWEENEY-TOOKES: It will be interesting to see though how many of those independent non-employed people will actually know about this, because I know Sea Grant has made really big efforts in Georgia to keep them updated, to keep them updated with resources, with websites and with forms. I mean, there is an email coming out like every other day on a really popular shrimp listserv to update fishers on what they're eligible for on any given day.

DR. YANDLE: That may actually be something where the council could do something that would be really useful, which would be just, through the APs, pushing out the information of, hey, these guys used to not be eligible, because they were contract employees, but now they are, and make sure all the boats know this.

DR. CROSSON: I think that's a fantastic idea, Tracy. If you send something to the panel members and ask them to forward it to people that they know that are in their industry, that would probably go a ways towards helping some people. Any other comments on the virus?

DR. YANDLE: Keep sending us those reports from the whatever it is.

DR. CROSSON: All right. If you all like that, I will send you the stuff from -- I have a subscription to *Seafood News*, and so I will send you those things as they come along. There was a good article in *The Washington Post* yesterday, and I don't remember if I sent it to the panel yet or not, but, I mean, the title of it was basically the seafood industry is collapsing, and so it was pretty dark, but I'll send it along. Do we have any other business?

MR. HADLEY: If no one else has any other business, I have a quick reminder. If you didn't get it yesterday, please let me know, but we sent out a notice that we'll be taking applications for the SEP, and the council will be discussing this in June, selecting SEP members, and I believe everyone, besides Jennifer, your first term is up.

If you recall, the term limits were implemented all at the same time, and so most of the members were kind of grandfathered in, and that's why everyone's term is coming up at the same time, or almost everyone's term is coming up at the same time, and so we really hope that you all stick around. The members on here are fantastic, and, if you do -- I know that we do have two, or potentially, three spots that will be opening up, and so, if you know of anyone that may be interested, please spread the word, and, as far as re-application, for those that wish to continue, it's just an updated CV, a cover letter, just stating your interest, and the NMFS conflict of interest financial disclosure.

DR. YANDLE: Could you let us know if we've already sent that to you or not, because I thought I got that into you guys a couple of months ago.

MR. HADLEY: I think you did, and I believe the -- I will go back and double-check, but I think that, for those that are on the SSC and SEP, those will be valid for both panels.

DR. SWEENEY-TOOKES: What is the term, John?

MR. HADLEY: I believe that the period of time is -- I would have to go back and double-check, and I can't remember if it's three or five years, but I want to say five.

DR. SWEENEY-TOOKES: I'm in year-four, and so I was just checking. Thank you.

MS. WIEGAND: Just to add to what John has already said, I mean, we feel like this is a great group, and we love working with you guys, and so, if you have any questions or concerns about re-application, please don't hesitate to reach out to us.

DR. CROSSON: Okay. I guess the next thing is the opportunity for public comment, if there's anybody here who wants to ask us anything, and I don't have a list of who is attending on my screen.

MS. WIEGAND: John and I can see who is attending, and, again, just like yesterday, if you would like to make a public comment, hit that little hand-raise button, and that will let us know that you're interested in speaking, and we can unmute you. Going once. Going twice. All right. I am not seeing any hand-raises, Scott.

DR. CROSSON: Okay. Beyond that, please -- I asked people to write down as much as they could, so we could start getting a report together. The SSC is going to be meeting remotely later this month, of course, and it would be nice to have a report done before then, and I don't know if it will happen or not, and I've got a lot of other things on my plate, but please get notes to me as quickly as you can, certainly by the middle of next week, so that I can start getting a draft of this report together for the SSC to approve. Don't just stick to -- If you have comments on -- If you wrote down things about anything, even if you weren't assigned it, send it to me, so that I can get it in there. Then hopefully we will be meeting next year in-person, with a vax team.

MR. HADLEY: That's the plan, barring world pandemics and whatnot as a caveat, right?

DR. CROSSON: Yes, absolutely. Does anybody else have anything to add?

MS. WIEGAND: I just want to say a big thank you to everyone for taking the time to still attend this meeting, and I know that we're all dealing with a new situation and trying to navigate through it, and so I know I speak for both John and I when I say we really appreciate you guys still tuning into this meeting and providing really fantastic input, and so thank you.

DR. SWEENEY-TOOKES: If I can chime in to say that I've been in a million of these meetings over the last few weeks, and this is by far the most organized and most technologically-capable group that I've been a part of, and so thanks, all.

MR. POLAND: I just wanted to echo what Christina just said, from a council member perspective, and I appreciate everyone's discussions the last two days, and we appreciate you all's time. Thank you.

DR. CROSSON: Okay. Thanks, all. At this point, we're closed, and hopefully next year some of those restaurants that we like will still be open in Charleston, and so hang in there.

MS. WIEGAND: Stay safe, everyone. Thank you.

(Whereupon, the meeting adjourned on April 9, 2020.)

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Amanda Thomas
April 27, 2020

SEP Meeting - Day 1 of 2

Attendee Report: (Wednesday)

Report Generated:

04/14/2020 08:57 AM EDT

Webinar ID

928-052-531

Actual Start Date/Time

04/08/2020 01:00 PM EDT

Attendee Details

Last Name	First Name
BROUWER	MYRA
Bianchi	Alan
Burgess	Erika
Cheuvront	Brian
Dumas	Chris
Flynn	Michael
Foss	Kristin
Guyas	Martha
Helies	Frank
Iberle	Allie
Iverson	Kim
Laks	Ira
Liese	Christopher
Martin	Felix
Mehta	Nikhil
Murray	Jason
Package-Ward	Christina
Poland	Stephen
Reiber	Ellen
Rhodes	Cameron
Sweeney Tookes	Jennifer
Travis	Michael
Waters	Jim
Whitehead	John
Yandle	Tracy
collier	chip
crosson	scott

SEP Meeting - Day 2 of 2

Attendee Report: (Thursday)

Report Generated:

04/14/2020 08:58 AM EDT

Webinar ID

538-432-699

Actual Start Date/Time

04/09/2020 08:02 AM EDT

Attendee Details

Last Name	First Name
BROUWER	MYRA
Bianchi	Alan
Burgess	Erika
Cheuvront	Brian
DeVictor	Rick
Dumas	Chris
EROH	GUY
Foss	Kristin
Guyas	Martha
Hadley	John
Helies	Frank
Iberle	Allie
Jepson	Michael
Mehta	Nikhil
Morrison	A13-Wendy
Murray	Jason
Poland	Stephen
Rhodes	Cameron
Riley	Anjanette
Scott	Tara
Sweeney Tookes	Jennifer
Travis	Michael
Waters	Jim
Whitehead	John
Yandle	Tracy
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