SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

HABITAT PROTECTION AND ECOSYSTEM ADVISORY PANEL

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Transcript

Habitat Advisory Panel

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Thomas Jones
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Casey Knight
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Attendees and Invited Participants

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Observers and Participants

Other observers and participants attached.

The Habitat Protection and Ecosystem-Based Management Advisory Panel of the South Atlantic Fishery Management Council convened at the Marriott, Charleston, South Carolina, on November 1, 2023, and was called to order by Chairman Stacie Crowe.

MS. CROWE: Good afternoon, everyone. Welcome to the fall 2023 Habitat and Ecosystem Advisory Panel meeting. One quick announcement, before we get started. If you're not staying here in the hotel, you need to see Michele to get hooked up to the Wi-Fi, so that you can connect your computer.

Okay, and so Cindy Cooksey took a position that required her to move out of state, and so, today, I'm going to be serving as the chair, and I think I would like to go ahead and start with a round of introductions, since some of you might not know me, but my name is Stacie Crowe, and I am with the South Carolina Department of Natural Resources, the Office of Environmental Programs, here in Charleston, and so let's just go ahead around the room. Roger.

MR. PUGLIESE: Roger Pugliese, staff responsible for habitat and ecosystem activities for the past thirty-eight years, and I'm wrapping up, and this will be my last meeting for the council.

MS. HOWINGTON: Kathleen Howington, and I'm going to be the new Habitat and Ecosystem Scientist taking over for Roger, and so hi everyone. I am just introducing myself.

MR. WHITAKER: David Whitaker, and I'm from Charleston, South Carolina, and I'm retired from South Carolina DNR.

MR. WEBB: David Webb, and I live is Islamorada, and I'm a recreational angler and a board member of the West Palm Beach Fishing Club.

MS. BUSCH: I'm Laura Busch, with the U.S. Navy out of Norfolk, Virginia.

MR. SPANIK: Kevin Spanik, South Carolina DNR, with the Reef Fish Survey.

DR. CHERUBIN: I am Laurent Cherubin, with Florida Atlantic University.

MS. KEENER: Paula Keener, marine biologist, retired from NOAA.

MS. DEATON: Anne Deaton, North Carolina Division of Marine Fisheries.

MS. KNIGHT: Casey Knight, also North Carolina Division of Marine Fisheries.

MR. JONES: Tom Jones, Georgia recreational fisherman, and I'm on the Georgia Wildlife Federation Board and the CCA Georgia board.

DR. RUNDE: Hi, folks. I'm Brendan Runde with the Nature Conservancy, representing North Carolina.

MR. WILBER: I am Pace Wilber, with NOAA Fisheries, and I'm not a member of the AP, but I've been asked to come here and speak this afternoon.

MR. MILLER: I'm Steve Miller, and I'm with the St. Johns River Water Management District in northeast Florida.

MS. CROWE: Wilson.

DR. LANEY: Hello, everyone. I'm Wilson Laney, with North Carolina State University.

MS. CROWE: Okay. Kathleen, do we have anyone online?

DR. QUINLAN: John Quinlan, and I'm with the Southeast Fisheries Science Center, and I'm not on the AP, but I'm here to give a presentation.

MR. SIMEN KAALSTAD: I'm Simen Kaalstad, and I'm with the Atlantic States Marine Fisheries Commission, and I'm also the coordinator for the Atlantic Coastal Fish Habitat Partnership.

DR. MORDECAI: Hi, everyone. I'm Rua Mordecai, and I coordinate the Southeast Conservation Blueprint. I'm not a member of the AP, but I'm here to give a talk.

MS. CROWE: Okay. Great. Thank you. Next, going down the agenda, it looks like we need to seek approval of the agenda, and so just a reminder that we do that by consensus, and so do we have approval for the agenda for this week's meeting? Okay. It looks like we've got nodding of heads sufficient for a consensus, and so the next thing is the Approval of the May 2023 Advisory Panel Meeting Minutes, and those were in your briefing book that Roger sent out, and so, again, we do this approval by consensus, and do we have approval of the previous meeting's minutes? Everyone, no objection? Okay. Great. Thank you.

We do open our meeting twice, once at the beginning of the meeting and once at the end, for public comment, and so, at this time, if we have any members of the public that would like to make a comment. Anyone? No. Nothing online? Okay. No public comment. Okay. Great. Thank you, and so, next, it looks like we have Trish Murphey, who is our Habitat and Ecosystem Committee Chair, who is going to make some remarks.

MS. MURPHEY: Thank you, Stacie. Yes, and I'm Trish Murphey, with the North Carolina Division of Marine Fisheries, and I'm the chair of the Habitat Committee on the council, and also vice chair of the council, and I just want to take a moment to welcome everybody for coming here, and I want to thank -- I know that Cindy is no longer part of the Habitat Committee, but I want to thank her for being the chair of this committee, and I also want to thank Stacie for stepping up as vice chair to fill in her shoes, and so thank you so much, and it's a big role.

I also want to thank Roger for all his time and efforts here for habitat in the South Atlantic Council and, you know, being a champion for our habitat for over thirty-eight years, and so, you know, we're going to miss you. I know this is your last meeting, and we're going to miss you. This council is going to miss you, and the habitat is going to miss you, but, you know, thank you for all your time and efforts in all the work you've done.

I know that I just also really appreciate everybody here, and I know it takes a lot. This committee takes a lot of effort and time, and there's a lot of work that this committee does, and I just want to thank you all for taking the time to be here and participating, and I'm looking forward to hearing

about the EFH five-year work that I know you all are working on, especially Simen and Casey and Wilson. You know, thanks again for being here, and I will just let you guys get to work, and so thank you.

MR. PUGLIESE: I guess the next thing we have on the agenda was the confirmation of the chair, and Stacie, with Cindy moving on to another job, Stacie is stepping forward as the chair, the way we have the rotation, and what you all need to do, before the end of the meeting, is elect a vice chair, so that you can have the coordination, and that's usually where we're working closely. When she is unable to do things, we work with the vice chair also, and so just, by the end of the meeting, if we can -- You all talk about it some and then figure out who would like to be able to help on that end and just get that wrapped up before we get done, and I will pass it back to Stacie.

MS. CROWE: Okay. Great. Thank you. It's a transitional period for our advisory panel, with me being new and Kathleen being new, and Roger, and all of his wisdom, getting ready to step away and leave us with the reins, and so bear with us as we kind of work through the agenda and figure out what we're doing. Today, we are mainly focusing on our EFH topic, and so the first presentation is Pace Wilber, with NOAA Fisheries, and he's going to give us an update on consultation activities this year.

MR. WILBER: Well, good afternoon, everybody. I am Pace Wilber, and I'm the Branch Chief for the South Atlantic and Caribbean Branch of the Habitat Conservation Division at NOAA Fisheries in the Southeast Region. We do essential fish habitat consultations in our group, and it's not the only thing that we do, and I will go through a little bit of some of the broader things that we do at the beginning of my presentation, but our goal here, usually with this, is to just give a quick overview of the program and the volume of consultations that are running through it each year.

This is our typical sort of org chart, and usually we show this organized by location, but, this year, I thought that it would be better to organize it by function, and so we essentially accomplish three different functions within the branch. We have a fish passage group, a coral conservation group, and an EFH group, and there are three people in each of the fish passage and coral conservation groups. Right now, we also have three people in the EFH conservation group, but we're planning to add some additional staff, that hopefully will be onboard by the end of January.

The fish passage team is quite busy. In addition to being focused on Georgia up to North Carolina, they're actually responsible for fish passage work throughout the whole region, and so that goes from Texas to North Carolina, and, yes, there are even fish passage projects in Puerto Rico. There are FERC dams in Puerto Rico that our group works on to provide safe, timely, and effective passage for NOAA trust resources.

As you can see from this figure, we do focus on watersheds that are on the South Atlantic side of the region, and that's largely because that's where most of the FERC dams are, and we have a system that we use for scoring each dam and then assigning it a priority for NOAA trust species, and those are the red areas here, and most of the areas that are most important to NOAA trust resources are in the South Atlantic, and so that's why that group focuses on the Atlantic side.

This table is way too busy. If you want to spend some time looking at it, you know, in your notes, you can, but it basically identifies where we are progress-wise in the focal watersheds, and I think

the most important thing really to realize is that this one column here in the middle, passage in place, that has a little number there in parentheses underneath, the year that passage was put in place is the number of miles that we have made accessible for NOAA trust resources just in the last ten years, and, if you total those up, we've been a pretty successful program, providing passage for over 1,400 miles, or opening up passage for over 1,400 miles of fish habitat in the region.

This is probably our most famous project, and it's certainly the one we like talking about the most, and this is Cape Fear Lock and Dam 1 on the Cape Fear River in North Carolina, and we worked with the Army Corps of Engineers and environmental groups to put a rock arch ramp in place of the dam, and now we're working to tweak the rocks that are in the rock arch ramp to provide a flow pattern that's more conducive to American shad and other species that we really are targeting for success at this facility. Moving to our coral conservation group --

MR. JONES: Who operates the lock, and how is that funding, when you've got -- Which is a great system, but funding the program?

MR. WILBER: So that particular lock and dam is a U.S. Army Corps of Engineers structure. It still is, and it's operated by the U.S. Army Corps of Engineers. The passage that was put in place there was mitigation for work that was done in Wilmington Harbor around the year 2000. It took them about ten years to actually construct the rock arch ramp, to mitigate for the impacts to shortnose sturgeon for the deepening in Wilmington Harbor, and then, since then, the modifications that have been done have been paid for by a mix of funds. Some of it is the port authority has contributed funds, and some of the individual port facilities have contributed funds, and some of the funds have been federal, and so it's much more of a composite kind of funding, you know, in the last five years.

MR. JONES: Great. Thank you very much.

MR. WILBER: Sure. Wilson.

DR. LANEY: Just real quickly, Pace, I know the modifications were done to hopefully improve fish passage, and, if I'm remembering correctly, they are still doing some acoustic telemetry, and do you have a brief update on whether things have improved a whole lot since the modifications to the rock weir?

MR. WILBER: So we're in the middle of a study to gauge the effectiveness of passage at this structure after the modifications were put in place, and I believe two summers ago is when the construction ended, and so that study is still underway, and certainly we've gotten briefs from the scientists doing the study, but we haven't really gotten what I would call a hard set of numbers, but I will tell you that I do believe the passage rate for American shad has gone up a little bit, but it has not gone up to the level that they were originally targeting, but, you know, as far as are we happy with the rate of passage there, we were happy with the rate even before the modifications, or at least that's the opinion of NOAA Fisheries, that we were happy with that rate, and certainly there is room for improvement, but it has worked pretty well, and we're happy to see this project continuing to try and improve itself.

AP MEMBER: Can I ask what the maximum depths are out there?

MR. WILBER: You can ask, but I have no --

AP MEMBER: Are they expected to run through six inches or water or a foot of water or eighteen inches?

MR. WILBER: The maximum water over the rock arch ramp?

AP MEMBER: Yes.

MR. WILBER: That varies a lot with river flow, and so there are times when the water is literally trickling through the cracks in the rocks, and so much of the ramp is exposed, and there is times when -- In the picture that we just showed, it was just sort of barely over the top of it, and there are heavy water periods, where the whole thing is underwater.

MS. DEATON: I was just going to add that I think it's fifteen feet deep upstream of the dam, and then, you know, you can see if there's breaking rapids, and it's not that deep, but they're also doing some -- They're working with the corps, and TNC is working with the corps, to do some flow releases, to like pulses, and so they will be pseudo-natural now, to get the water higher at times, and get the fish up more, and so I've heard it's a combination of that and the fish passage that's helping.

AP MEMBER: Well, I've observed American shad crossing really shallow areas, and seeing them come in, when just their back starts coming out of the water, and a lot of fish won't cross it, and some will. Some are jumping over, but it seems to be a real barrier about body depth.

MR. WILBER: Moving on to the coral team, our coral team is located in southeast Florida and the Caribbean, as you might expect, and they do a whole suite of activities focused on coral conservation. In the last few years, they've been focusing on stony coral tissue loss disease, usually abbreviated as SCTLD, and trying to survey corals in the reefs, to determine how prevalent the disease is, and testing various ways for treating the disease.

This is a picture of Dr. Dinorah Chacin, who works in our group, and she leads an effort in the Virgin Islands to survey and treat stony coral tissue loss disease, and, in the last few years, they've done over 22,000 interventions by applying or testing various types of antibiotics for corals and moving them to nurseries and so on, and they work at eighty-four sites, and they've had almost a thousand dives in the last few years. It's a lot of work to kind of keep this stuff organized and keep it moving forward.

In addition to the stony coral tissue loss disease, we work closely with the scientists at NOAA, and at universities, to study various things that are important for coral conservation, things like the effects of sedimentation on corals and whether it affects their health, measured through a wound healing kind of assay, and we also look at the effects of herbivores on corals and how the density of herbivores affects the conservation success, or the restoration success, of corals, and we also look at sediment accumulation on corals in major ports, and, if you kind of read the newspapers, at least in southeast Florida, we released a report, in August of this year, that provided a wrap-up view of how corals were affected by the deepening of the Port of Miami in -- The dredging occurred in 2013 through 2014, and our studies were done in 2015 and 2016.

They found almost 300 acres of impact to corals from the dredging event that were not anticipated, and we're now working with the Army Corps of Engineers on the best path forward for addressing that impact.

These kinds of studies are very labor intensive, and it requires organizing dive teams, you know, from multiple agencies, collecting data, and putting it through a lot of rigorous QA/QC, because the conclusions of these reports, you know, can be pretty volatile at times.

AP MEMBER: Regarding the sediment and the impact on the corals, other than dredging exercises, there has been a lot of news coverage of the shallow ports, Key West for example, where the large cruise ships come in and stir up tremendous amounts of sediment, and then it goes out to the nearshore reefs, and are you guys involved in looking at that, or is that on the list?

MR. WILBER: We are not involved in looking at that. We do recognize that as a real problem, but we have not had the human resources, really, to look at it directly, but, yes, we totally hear the same stories that you're hearing, and we share the same concerns.

Okay, and so we're going to move on to EFH, which is what I really get asked to come here and talk about, and so our EFH responsibilities stem from the Magnuson-Stevens Act, which was reauthorized in 1996 to add the essential fish habitat provisions to it, and we often get asked, well, how does the EFH relate to our previous, and still extent authorities, that existed outside of the Magnuson Act, and that other authority is predominantly the Fish and Wildlife Coordination Act and the Federal Power Act.

Under the Federal Power Act and the Fish and Wildlife Coordination Act, we largely can go from the mountains to the EEZ and talk about anything that was affecting NOAA trust resources. What the Magnuson Act did, with its EFH provisions, is it did not add to or subtract to our authorities, and it simply gave us a lens for focusing those authorities, and that lens is to really focus on essential fish habitat, which obviously is going to be predominantly within the coastal area.

These are three somewhat lengthy quotes from the Magnuson Act that essentially summarize the EFH program. The first quote basically says that federal agencies that are taking actions are going to consult with NOAA Fisheries on actions that may adversely affect essential fish habitat, and so one of the first questions there is, well, what is essential fish habitat, and that is something that we look to the council to do, and so you're going to have a lot of discussion today about updating essential fish habitat designations and the importance of doing that, and, well, that's something that the Magnuson Act requires, and it's something that is really essential to us in operating our EFH program.

The second real big pillar of the Magnuson Act is that, once essential fish habitat is designated, and someone is consulting with us, if we become aware of actions that will adversely affect the habitat, NOAA Fisheries must provide EFH consultation recommendations for it. It's not discretionary. If we believe those impacts are present, we must provide those recommendations, and then the last pillar of the Magnuson Act is in the bottom part there, and that is a requirement that a federal agency receiving EFH consultation recommendations must respond to us telling us what they did with those recommendations, and, if you go back to what was going on in the 1990s, when the Magnuson Act was amended, that was a time when the government was really kind of

looking at itself and trying to gauge its effectiveness. You know, how good are you at doing things?

When it came to NOAA asking, well, how good are you, under the Fish and Wildlife Coordination Act, at protecting NOAA trust resources, we largely just sort of shrugged our shoulders, because we had no information stream really to kind of base that on, and so, when they added the EFH provisions to the Magnuson Act, they avoided repeating that mistake, and they're making a feedback loop into the act, and so agencies, when they get our recommendations, they have to respond back to us, telling us what they did, and then that puts the onus on us to actually manage that information and put it together into summary tables and to report on it.

We did talk a little bit about the council's role in identifying essential fish habitat, and there's, in the rules, a system of levels that the information is based on, and those levels basically go from presence/absence, which is a very simple hurdle to get over, to areas where the fish live that are actually going to be recruiting into the fishery, and so that's a relatively small area, and a very important area, because that's where the actual fishing is kind of occurring.

Then there's some intermediate levels there, and so, when the council designates its essential fish habitat, it's very valuable, to us, for them to identify the level of information used for that designation, because it helps us in our triage process. Obviously, if somebody is proposing an impact to an area where fish just happen to occur, in a presence/absence sense, that's not going to get a very high priority for us in trying to evaluate the impacts, but, if they're proposing an impact to an area where we know fish have superior rates of growth, survival, and reproduction, well, that's a really important area for that fish population, and we're going to put in a lot of effort to try and conserve that area and protect it from any proposed actions.

DR. RUNDE: Pace, can I jump in and ask a quick question?

MR. WILBER: Sure.

DR. RUNDE: Thanks. To what degree is it the prerogative of NOAA Fisheries to determine where a habitat in which a proposed impact might take place falls on this triangle, if it's a habitat that is one that is usually or has never been disturbed in the past?

MR. WILBER: So this triangle is supposed to be essentially a science exercise, and there are various source documents that are fed to the councils, or, in the few cases where the Fisheries Service is the actual manager of a fishery management plan, these source documents feed into the group that then designates the essential fish habitat. These source documents ideally very clearly identify the kind of information that those are based on and then make a recommendation for what should be EFH, and then, once it's up to the -- Once we get into actually doing an EFH consultation, we shouldn't be making a judgment call on what the level of EFH information is for that area, and we should be referring to the source document that the EFH designation is based on.

DR. RUNDE: Thank you, and not to start a back-and-forth, but just, in a case where you know there is presence, and you may know there's concentration, but you don't know the answer to growth, reproduction, survival, or recruitment, whether or not that particular habitat, or area, may be important to that degree, and how does that work?

MR. WILBER: Well, operationally, we tend to kind of err on the side of going up the triangle, rather than going down, but that usually does not affect the actual recommendations we make, and it affects whether we have the time to work on it, and we'll get into that question in a couple of slides.

DR. RUNDE: Thank you.

MR. WILBER: Go ahead, Roger.

MR. PUGLIESE: One thing I think we have tried to, in the South Atlantic, very different than some of the other areas, is identify a lot of the habitats, and then the fishery information supports those habitats, in terms of the designations, and so there's -- I think it has set us up in somewhat of a good position, in terms of protecting larger amounts of areas, because you don't have as much detail. Then, when you get down to the actual permitting areas or whatever, you get even further into some of that information, and can fill it in, but I think the good news is that, by doing that, by going down that road where we have gone and identified those, there may be some resiliency, in terms of the long-term climate issues on this, because, as habitats are shifting or whatever, you're still identifying and characterizing those habitats with the fishery information detail, wherever it falls, to then justify even more significant discussions in the consultation process. That's all.

MR. MILLER: Can I ask -- How do you consider -- I mean, when you have a nursery habitat in an estuary, you have a dynamic component, which is flows, or salinity, and you have a static component, which could be grasses, or it could be oysters and stuff, and how do you consider a project that will change the salinity regime on these static habitat components and, over the long-term, probably make them unsuitable, and fish will search out the salinity, instead of the particular habitat, and the answer has been, well, those habitats will migrate up the river, but sometimes there's not spaces for them to do that, and so my question is how do you consider that in this?

MR. WILBER: We do our best to consider that issue. In order to do that, obviously, we need a good forecast of where salinity regimes are going to be moving, and that is a very difficult forecast to get, and, when you get it, it tends to be tied to very complicated projects, high-budget projects, that can afford the modeling effort needed to do that, but we do consider things like that in the deepening of Charleston Harbor, for the Post 45 project, and we did it for the Savannah Harbor expansion project, and hopefully we'll be doing it for the Wilmington project that's planned in the next couple of years.

MR. MILLER: I'm familiar with it from dredging the St. Johns River, and, basically, they looked at the main stem of the river only, and all of the surrounding marsh habitats, and critical habitats, were not considered in the EIS for that port dredging, for that dredging project, and it concerns me that they're thinking those oyster flats are going to move upstream of Jacksonville, because I don't think that's going to happen. Well, maybe over a hundred years, but --

MR. WILBER: So I remember that project, and we did recommend that the Corps consider the migration of salinity regimes up the St. Johns River, including the tributaries, and we even named specific tributaries for them to look at. We make recommendations, and we don't make demands, and so the recommendation largely wasn't followed by the Corps, and, as you'll see in a little bit, we don't have a lot of staff in northeast Florida, and so we didn't really have the human resources to really duke it out.

MR. MILLER: Well, I just have been involved with an intense study to look at the impact of freshwater inflow on that estuary, and we've identified that, and I went to one of the initial dredging meetings, and I was never invited back.

MR. WILBER: I can identify with that. All right, and so this map here is all of the EFH consultations and Fish and Wildlife Coordination Act consultations that we've done in our office from 2014 to 2022, and there's a couple of things to kind of note from this, is that the EFH program is really honestly an intertidal program, and, I mean, we talk about EFH out in the Gulf Stream, and we talk about it way up river, but, when you actually get into how the program gets implemented, where are people proposing actions that trigger a consultation, these are largely actions within the intertidal zone, and, if it's not in the intertidal zone, it's awfully close to the intertidal zone. We don't really do a whole lot of stuff out in the ocean.

The other thing that I will note too is that the little table there on the right -- Most of the actions, not surprisingly, in the South Atlantic, you know, are proposed for the Atlantic coast of Florida, and South Carolina is second, followed by Georgia and North Carolina essentially tied for third, and then we get very few proposed actions in Puerto Rico and the Virgin Islands, and so, geographically, it's largely a Florida intertidal program, for the most part.

This kind of gets to some of the things that we alluded to a few minutes ago, and we have a relatively small EFH team. We have a lot of consultations coming into the office, and so we obviously can't get to all of them, and, in fact, we barely get to 50 percent of them, you know, in most years, which means the other 50 percent go unreviewed, and so this particular bar chart here, going from 2014 to 2023, shows, in blue, the ones that we have reviewed, and it shows, in orange, the ones we have not reviewed, and the ones that are at the bottom part of each bar, which has the blue hash marks, those are the ones that get EFH consultation recommendations, and the ones in solid blue get no objection responses, because our best judgement is that no significant impacts to EFH were proposed.

The difference between the hatching and the solid orange lines is, you know, back in the day, when we were fully staffed with admin folks, we could respond back. Even when we didn't review something, we could send what we would call a no-staff letter back to the action agency saying, sorry, we're just too busy, and we can't get to this.

Even that takes time, and even that builds a federal record, and that federal record must be managed for at least five years, and so, in order to further get more time to focus on high-priority projects, we stopped sending those courtesy response letters, and we just now just ignore it. If people send us a public notice, we don't respond back at all. That way, we're not producing a federal record that we need to manage for five years, and we're not taking the time, you know, to provide that, and so that's what the hatched area is in orange. It's unfortunate, but we're not even really responding back, on the negative side, as much as we used to.

The black line that bisects each of these stacked histograms, that's the 50 percent number, and that's the number we target, you know, for response every year. If I had the 2013 bar chart up here, it would be pretty low, and we were down around like 25 or 30 percent in 2013, and we started a new program at the end of that year, to try and increase our response rate, and we've done a pretty good job. We've gotten above 50 percent in almost all of the areas since 2015, and I'm

not sure we're going to get any higher than where we currently are, but, you know, we're feeling that we're doing a pretty good job at that rate.

Now, one of the ways to look at that rate is to think about it in terms of acreage, and so what this graph shows is, if you imagine, for one particular year, and this is actually 2013 data, but, if you took all the projects we looked at that year, which was almost 900 projects, and you assigned an impact acreage to each one of those projects, and then you sorted them all out, and so the smallest one was on your left and the biggest one was on your right, and now all you're going to do is you're just going to make a cumulative curve, and so you're going to add the smallest one to the next smallest one, and then add that sum to the third smallest one, and so on and so on, until you get up to the very end.

The first thing you will note is that, for most of the projects, their cumulative acreage is really, really small, and there's only a couple of handfuls of projects that literally get into the hundreds, and sometimes even thousands, of acres of impact that really constitute 80 percent, or 90 percent, of the acres that come across my desk, even though they might only be a couple of percentage of the consultations that come across my desk, and so that black line in the middle there shows you about where the 50 percent number would be on that curve.

I could do 50 percent of the acres that come across my desk and barely get to a hundred acres, or I could do -- From the other side of the curve, I could do 50 percent, and I could do over 25,000 acres, and so we always want to try and get to these projects based somewhat on size, and so we come at this from the right side of the curve and not from the left side of the curve.

The other question we often get asked is, well, what happens after you provide these EFH consultation recommendations, and, you know, how successful are you at actually changing a project, and this graph here kind of depicts that, and we're going to talk really mostly about FY17, which is the third one over from the left, to FY23 first, and so what we've done is looked at the conservation recommendations we made, looked at the responses that we got back from the action agency, and we sort of categorized the response as either being fully responsive to all of our conservation recommendations, partly responsive to our recommendations, and like they took some, but they didn't take others, and then the red is they completely blew it off, and they did not accept any of the recommendations.

You can see that, fortunately, from 2017 on, the height of the red bar inside each of these histograms is relatively low, and so we get blown off very, very rarely. The height of the green bar is actually pretty good, you know, and, most of the time, we're getting all of our conservation recommendations accepted, and the blues are the ones in the middle, and so we're feeling pretty good about that.

If you look at 2015 and 2016, there's no blue there, and that's largely because of the way we were collecting the data, and so we basically have mixed the blue and the red together in 2015 and 2016, because of the way we did the data, and we haven't had the time to go back and reclassify those particular years, but the height of the green bars there is still pretty good.

AP MEMBER: What do you attribute the trend towards more compliance? Is there more enforcement, or is there more pressure, or what -- Do you have an idea?

MR. WILBER: Sure, and I have an idea, but the first thing to note too is that the height of all of these bars has gone down over time, and so we're actually making fewer recommendations that we used to make, and that's kind of something you can see in the previous graph. By making fewer recommendations, we are providing more focused recommendations, and we're having more focused follow-up with the individuals at the action agency, and so we're kind of building that peer-to-peer relationship that really is important to making a lot of this stuff work, and so I think that really is what's accounting for the large percentage of fully successful recommendations.

Then the other side of this is we often get asked, well, what's the lag in time between when you provide a conservation recommendation and when you know what the outcome is, and there are times when it happens like within thirty days that you know what happens, and there are times that it's five or six or seven years before you know what happens, but this graph has, on the X-axis, the responses, the number of recommendations made, and the Y-axis is the number of times we've heard back from the action agencies.

If you allot for a two-year lag, which is the typical time between making a recommendation and getting a response back, you get a really nice straight line here, and so it's typically a two-year kind of timeframe.

Okay, and so the last thing I'm going to do is go through some of the major projects, the big, time-consuming ones, and the high-impact ones, and the high-profile ones, that are in our area, and Brian Hooker I thought would be here, and I guess he's going to be here tomorrow, or he may be online, and so I get to say a whole bunch of stuff about BOEM that he won't hear about.

Offshore wind energy, CVOW, in the upper-right corner, and, even though CVOW technically is inside the region of the Greater Atlantic Regional Office of NOAA Fisheries, Cindy Cooksey, and others within our office, spent a lot of time helping CVOW through its EFH consultation. That consultation was completed in July of this year, and, yesterday, BOEM actually announced signing the ROD for CVOW, and so hopefully CVOW will have a smooth sailing forward and will be able to be implemented within the next couple of years. Now, crossing the line from Virginia into North Carolina waters, we get to the two Kitty Hawks.

AP MEMBER: Sorry, Pace, but can we stay on CVOW for a second?

MR. WILBER: Sure.

AP MEMBER: I don't want to derail you. You had a head of steam there.

MR. WILBER: Go for it.

AP MEMBER: In Brian's absence, or, if he were present, maybe he would say the same thing, but I was just wondering if you could comment at all on that record of decision, since you brought it up, and maybe it's not on topic, but the fact that they might be -- Alternative C, if you're familiar with the Sand Ridge feature, wasn't chosen there, and just maybe a brief --

MR. WILBER: You're going to have to ask Brian that, and I didn't get a chance to read the ROD, and I do know that, if we were color up whether these recommendations were fully accepted, partly

accepted, or not, this would definitely be a partly one, because of the issue that you just brought up, but you would have to talk to Brian.

AP MEMBER: And a lot of acres, too.

MR. WILBER: Yes.

AP MEMBER: Thank you.

MR. WILBER: All right, and so, jumping to Kitty Hawk, Kitty Hawk is broken into two components by the lease holder, Avangrid, a part they call Kitty Hawk North and a part they call Kitty Hawk South. Honestly, I think, if most of us looked at these on the map, we would think of them as Kitty Hawk West and Kitty Hawk East, but, you know, the owner gets to name them what they want.

Kitty Hawk North, Avangrid has been pushing that pretty slowly, but steadily, since they got their lease, and, right now, the EFH consultation was supposed to largely occur between December of this year and October of 2024, and there is actually a proposal now to have the dates for this slide at least two or three months, and so it largely will be an FY24 and FY25 consultation for us. We don't have really solid dates yet, but we know that they have run into some issues with their marine mammal permit application, and that's kind of forcing some delays.

Kitty Hawk South, that project was looking to be an October of 2025 to June 2026 kind of EFH consultation, and we have a proposal, from Avangrid right now, to slide that another whole year, and so it looks like it will be a 2026 and 2027 kind of consultation, and so Kitty Hawk South is going to take a while.

Carolina Long Bay is a joint effort by Duke Energy and TotalEnergies, and one of them owns one-half of the lease, and the other owns the other half of the lease, and their site characterization work is underway. They have been really, really cooperative, and they're communicating with us constantly about buoy deployments and how they intend to put the buoys out there, helping us contribute to the kinds of data the buoys will be collecting, and so we're really hopeful that that project is going to move pretty smoothly, but they're still in the very early site characterization stages, and they really don't have any kind of timetable yet for when the EFH consultation will be done. Just as a trivia question, on the lower-right there is a picture of the only absolutely installed and operating offshore windfarm in the United States, and does anybody know what windfarm that is?

AP MEMBER: It looks like Block Island, and I will take the opportunity to ask a question.

MR. WILBER: It is Block Island, the most photographed windfarm in the U.S., because, every time somebody wants a picture of one in the water, there's only one place they can go to get that picture.

AP MEMBER: Does the EFH consultation for offshore wind include the cable export route?

MR. WILBER: Yes.

AP MEMBER: In the case of Kitty Hawk South, where that is far from determined, but there are several on the table, how does that work? Do you look at all of them?

MR. WILBER: Yes, and so that's the next little chapter on windfarms here, is Kitty Hawk South. Kitty Hawk South is proposing two routes to get their power ashore, and one keeps them out in the ocean, for the most part, until the very last minute, and then they cut across Bogue Sound, and then the other route takes them into Pamlico Sound, essentially as quickly as they can get, and then they go through the whole length of Pamlico Sound to get to the same endpoint, near the Marine Corps Air Station in Cherry Point.

Largely because Kitty Hawk South is just slow in its development, we're not really aware of any, I would say, incremental decisions that are starting to show which of those two directions that Avangrid is going. We are aware of data that they're collecting, and we're aware of modeling studies that they're doing, but, as far as like decision-making, I'm not -- I'm not aware of anything that's kind of heading in that direction.

I mean, I think, as everybody in here knows, because many of you guys are from North Carolina, every resource agency has told BOEM, and Avangrid, under no way are we going to let you go through Pamlico Sound, but, you know, maybe it's still on the table, but I don't know how seriously it's on the table.

All right, and the last thing that I want to talk about, very briefly, is Port Everglades. It seems like I've talked about Port Everglades during these yearly synopsis meetings for close to twenty years, and this project does not go away. It goes on and on and on, and so this is sort of a schematic of Port Everglades, and there are some things in here that are just sort of distractions, for the most part, and that's the Navy excluded area that's in gray down at the bottom, but the areas that are kind of around the channel, that are drawn out here, are different impact areas that the Army Corps of Engineers is considering in determining the impacts from Port Everglades.

You know, the bottom line to know about Port Everglades is it's almost like being in a high school yearbook contest. It is the largest amount of impact ever proposed by the United States government to coral habitat. It is the largest coral restoration project ever proposed in the world to mitigate for those impacts, and that mitigation plan requires the largest coral relocation plan ever attempted by anybody in the world, and it's just superlative after superlative, in order to really understand how this project differs from all the projects that have preceded it, and, because the scale of the impacts here, and the scale of the mitigation are so huge, and so unprecedented, it's taking a lot of years to kind of get through all the studies on this project, and, unfortunately, those time delays are leading to increases in costs in the project, and those cost delays are really starting to take their toll on what the overall project budget is and what the overall project feasibility might be.

We are working with the Army Corps, and the state agencies and the Fish and Wildlife Service and EPA, to try and make sure that, if this project does move forward, it moves forward in a way that minimizes the impacts to coral habitat, and we've heard many people say that this project does not end up repeating the mistakes that we saw in Miami, and, as I mentioned in the beginning, you know, we have two-hundred-and-seventy-some-odd acres of indirect impacts to coral habitat, at least, from the Port of Miami Phase III dredging, and we want to make sure that we don't end up with the same situation here.

It's a very controversial project, and I could talk for days about it, but, you know, Roger is telling me that I need to stop talking now, and so I'm happy to talk to you guys more about it tomorrow evening, during the social, if you would like, and I'm sure every one of these meetings, for the next couple of years, will be talking more and more about Port Everglades.

I have one more slide on Port Everglades, and it also -- Aside from being a huge impact, and a huge mitigation, and a huge relocation effort, it also has some really novel uses of technology to monitor the dredging in real-time, and hopefully have like stoplight indicators that can actually affect how the dredging gets done, and this basically shows how some of those stoplight indicators would be operating, and this shows, in particular, the buoy placements that would be around the port, but, right now, these buoy placements, as the picture shows here, is draft, because we're thinking about relocating some of these buoys to be in more strategic locations, but it will be -- If the project does move forward, it will also be the most intensively monitored project ever, because not only are you going to have all the commitments from the Army in the port that make it intensively monitored, but every university, every NGO group, you know, every high school group out there is going to be doing something to monitor this project and report on what they see.

To wrap up, the EFH program is largely an intertidal program, focused mostly in Florida, but we do have substantial work occurring in the Carolinas and Georgia. The number of projects that we review each year has been kind of dwindling, if you kind of go back to our peak in like 2015, but I used to report that it was continuing to decline, and I don't think it's really continuing to decline anymore, and I think we're kind of stabilizing now at the number and percentage of projects that we're reviewing, and the large projects get most of our attention, and so it's the infrastructure projects, the ports projects, and offshore wind, and so that largely means like the marina projects, the beach nourishment projects, the dock projects, and those are the things that don't get as much attention as they used to, because, you know, with the limited human resources available, we have to focus on the bigger ones. If anyone has any more questions, I would be happy to answer them. Paula.

MS. KEENER: Thank you, Pace. That was an excellent presentation. When you say large projects, I know, initially during the presentation, you mentioned size, and is that the only variable that defines large in your decision-making?

MR. WILBER: No, and it's a deliberate oversimplification, but like, obviously, large, when you're talking about oyster reefs, is different than when you say large when you're talking about a coral reef, or large when you're talking about like a sand habitat, and so you can produce those curves on a habitat-specific basis, and we've kind of done that. They're not really show quality, but they're decent enough curves to guide us.

We do consider the nature of the habitat, in addition to the acres, but -- And even the geographic location sometimes also affects the nature of the habitat, but, you know, you used to work for NOAA, and NOAA likes to really simplify metrics, and so I get asked to report on acres all the time, and they just want total acres, and so that's the one that we usually track.

DR. LANEY: Thank you, Pace, and I echo what Paula said. This is a really excellent presentation, and I think I said this last year, but I will say it again, that it would be nice if my former Fish and

Wildlife Service colleagues could provide us the same sort of detailed analysis of their regulatory review program that you provide for the Habitat Conservation Division, and I really appreciate it.

I have just one comment on that one slide that shows basically the triage and the decline in the number of what we used to call no-action letters, which were kind of the courtesy letters, and I understand why you do it, and I'm totally emphatic, and sympathetic, with the lack of staff that -- You know, would be required to do a comprehensive response under the Fish and Wildlife Coordination Act, and Magnuson-Stevens, for each and every project that you receive, and I guess my concern stems back to a paper that Bill Odem wrote, many, many years ago, and you know which one I'm talking about, and Bill talked about the death of a thousand cuts.

I know, you know, a small dock project is not to be compared to Port Everglades, for sure, but, when you total up the numbers, the impact is there. You know, the cumulative impact is there, and have you all -- Even though I know you don't have the staff time to respond to all of those, have you, or anybody else, taken a look at what the cumulative impact is of all those other smaller projects that don't meet your triage criteria?

MR. WILBER: We have looked at it at times, and I would not consider the analysis to be comprehensive, but the one that sticks in my mind comes from 2014, and, in that year, we totally ignored somewhere around 2070 dock projects, and the cumulative acreage of those 270 dock projects was less than ten acres, and so that made us feel kind of comfortable about blowing off the docks. Paula.

MS. KEENER: One more question. You also mentioned that, overall, you all were making fewer recommendations, and is that because you're reviewing fewer projects, or is it fewer recommendations per project? Thank you.

MR. WILBER: It's a little bit of both. I mean, honestly, there's some cherry-picking that goes on. The 50 percent number is a pretty hard number that we have to meet, and Tom is here from Georgia, right? Okay, and so Georgia has greatly increase its dock permitting in the last couple of years, and they do a really great job in the Georgia CZM program, with making sure that the docks proposed in Georgia are already doing everything they can to minimize impacts to essential fish habitat.

They've become very easy, low-hanging fruit no-objection letters from us, and so we go and grab all the Georgia projects, in order to kind of get closer to our 50 percent, without having to spend a whole lot of labor to get there, and so back to your question, and there's a little bit of that kind of going on, and, you know, we're reviewing fewer projects, but we're also trying to also make sure that the projects we review have kind of a very clear exit for us on the EFH consultation strategy. Anne.

MS. DEATON: Just a question on that, and I was thinking -- Don't you think that scoping meetings and all that, and I guess it is consultation, but beforehand, and they modify their project, right, and so you don't have to have as many conservation recommendations, because they've already accommodated it in their process, or do you --

MR. WILBER: No, and I totally agree, and so then the question is, across our geography, how common are these pre-application meetings, and, in North Carolina, they're extremely common,

and I think even they're required by North Carolina law. To get a state permit, you have to go through a pre-application process. You don't see that anywhere else in the region. You know, we do a pretty good job tracking our pre-application meetings, and it's easily ten-times more in North Carolina than are occurring in the rest of the region.

MR. PUGLIESE: I think you bring up a really significant point though, because that's something that I was going to raise just in general for their activities in the past, and we've talked about this many times, is that there's so much done in the background, and advancing policy, advancing what recommendations, trying to get those -- I remember, you know, that there was a time where we really had done a lot with the Corps, in terms of beach renourishment, kind of getting some of these upfront, and so, before they ever actually were even proposing, they were accomplishing some of those, and so it gets lost in some of the statistics of that, and I think that's a huge thing, and so, the more you can advance that kind of dialogue, advance the policies, advance the comments and recommendations, you can kind of front-end load, and eliminate a lot, and that's got to be part of what you've got going on, but hopefully that goes on. The only thing is that I remember the other side, the flip side on that, is that changing nature of the Corps, and you build all that knowledge, and then -- It's a challenge.

MR. WILBER: Yes, and, I mean, just to reinforce that, fifteen years ago, the venue for these pre-application meetings was a Corps of Engineers office, and they handled most of the meeting logistics, determined who was going to these meetings and so on. For the same human resource pressures that we're under occurring at the Corps, they stopped doing those meetings, and, really, the states haven't really stepped in to fill the void, except for in North Carolina, where they've actually done an outstanding job filling in that void, and so the number of meetings is -- Like I said, I mean, we probably do, what a hundred a year in North Carolina, easily, and we do maybe six in the Savannah district, and we do zero in the Charleston district, and we do maybe fifteen or twenty in Florida, I mean, just to kind of give you an idea of the disparity in the numbers. Puerto Rico used to be a very big investor in these pre-application meetings too, but they have trickled down to zero there as well.

MR. WEBB: Without trying to drag you into a political comment, when you're looking at the different states, and you're looking at the zealous way that they either approach dock and seawall permitting, or not, which obviously impacts how much work you have to do after the fact, but where does Florida rank with that, and the reason I ask is that I live in Monroe County, and I know for a fact that Florida DEP has one investigative officer in the entirety of Monroe County, and so I have personally seen a lot of things happening, in residential areas and commercial areas, that are obviously not compliant with what we're talking about here.

MR. WILBER: So, I mean, I don't mind too much getting pulled into a political thing, and that's what happens when you're kind of like Roger's age, and you're ready to kind of like leave, but the amount -- We did an analysis one time where we looked at the number of proposed actions affecting EFH based on the per capita number of people, you know, and we did it on a county basis, and the number of impacts per whatever number of people we were using in Florida was like three-times higher than what it was in the other states, and, you know, there is just some things that are just every day that you see in Florida that you don't see anywhere else.

Like, every day, I get a public notice proposing to fill a saltmarsh, or a mangrove area, in order to build a residential development or, you know, a strip mall or something, and I literally get one of

those every day. I have never seen one of those in North Carolina. I have never seen one of those in South Carolina. The only time you see really impacts to those kinds of habitats, in the Carolinas or Georgia, is usually when there is a DOT behind it, and the DOT really has no choice but to run the road in this particular direction, and you've got to figure out some way to help them do that with minimal impact. The general -- In my opinion, the general public's perception of appropriate land use is very different in Florida than it is elsewhere within the region.

MR. PUGLIESE: One other thing too is I think it's a decentralized system in Florida, versus some of the CZM programs in the other states, where I think the history behind like South Carolina's -- I mean, they dug their heels in a way, way, way long time ago, and they established some of these, and I think that's why we don't see proposals like that, because some of those battles were fought back when they were trying to -- All types of things, and there were huge battles that were fought, and I would say, in Georgia, they were having to balance that with the fisheries, and so it's right there, and they can reinforce some of these issues, and so I think some of the logistics in the way that operates is probably what kind of feeds that beast.

MS. CROWE: Any other questions for Pace? Okay, and so kind of our action item for Pace's talk was to decide if there were any areas that he discussed that might be a priority for the panel to provide more input, or guidance, to the council, and does anyone have any ideas about that?

MR. PUGLIESE: Part of that is -- I guess it kind of bounces to Pace too, in terms of focus too, because I think -- He has indicated this before, but, as some of these bigger projects are moving forward, sometimes there are certain key points, where, while they're in the full EFH consultation process, there may be a benefit of having direct coordination, and maybe potential input, as an additional letter, or additional input, from the council, and so it's the opportunity to see if some of those are -- Then also this whole effort of looking at the whole thing is really folded into the bigger picture of are there things in the wings that are going to become significant that this panel can help the council provide additional recommendations into the future, and so I think that's kind of putting it into that context to be ahead of the curve before things just fall on top of everything.

MS. CROWE: So, along those lines, one of the things that I will bring up on the state side, and I'm pretty sure, Pace, that you've been seeing this as well, but a lot more of is proposals for tide gates, which the immediate impact is small, but the greater impact on EFH, and habitats down the road, is great, and, from my perspective, they kind of get bounced back and forth, where recommendations get ignored, and I don't know, Pace, and do you have any input on that, from your perspective?

MR. WILBER: I mean, if I were to pick an emerging issue, it would be tide gates, and I'm going to throw living shorelines into that hopper, too. In a lot of literature, living shorelines are dirt and vegetation plantings and oyster shells, things that no one really can object to, but, in a lot of practice, living shorelines are concrete that might eventually have an oyster attached to it, or might be protecting a potted plant that's really just mangrove, you know, and anything else, but they're breakwaters, and they're not living shorelines, and those are getting to be more frequent, and more problematic, as Anne can attest to, because we've been making kind of a stink about those in North Carolina in the last few months, but, yes, that would be something that the council could weigh-in on, you know, what is an acceptable kind of living shoreline kind of approach.

When you start building these breakwaters, how much fishery access needs to be available to the habitat behind the breakwater? I mean, is it okay to put 2,000 feet of rock literally at the marsh-vegetation mudflat interface, with no breaks for animals to access the marsh? I mean, we recommend, constantly, that those breaks need to be in there, but there's a huge environmental community, and a huge environmental consulting group, that argues that, no, that isn't necessary, and you can go ahead and separate that access, and, you know, right now, the nexus for most of those discussions is North Carolina, but we've had those in the other states as well.

MS. CROWE: Paula, I think you had your hand up first, and then Anne.

MS. KEENER: Go ahead.

MS. DEATON: I was going to say that both of those issues are all about sea-level rise and climate change, and maybe could be tied into the climate change policy, or it could be a separate thing, but, anyway, it's just going to keep getting worse, because the data is showing sea-level rise rate is greater than they expected, and, you know, we're not on the low end of that rate, and so the question is, you know, what can you do, and what should you do? It's a big question, and so we just had a whole habitat tradeoff workshop in North Carolina, to try and get some -- To get everybody on the same page, and it just needs follow-up on what does the research show, you know, what are the best options, and what does everybody have to take into account and find some kind of happy medium, because all this resilience money, from all these transformational grants, that's the kind of thing that they're -- You know, they like them, because it does look good, but is it good in the long run, and that's the question.

MS. KEENER: Thank you, and that was the perfect segue to my question. Pace, there are members on this AP that are serving on a working group to update the council's energy policy, specifically as it relates to wind, and you mentioned, in your presentation, that you all are involved, or have been involved, in very few offshore consultations. Given your knowledge, and understanding, of the uniqueness of our region, can you offer any forward-looking guidance to us, as a committee, regarding considerations, or pre-guidance, in our deliberations? I know that's like a thesis, isn't it?

MR. WILBER: Well, it's too bad that Brian is not here for this one. So, for the last year-and-a-half, I've been attending almost all of the meetings in Northeast about wind, and so I've been part of all of the struggles they're having. I think we're very fortunate, in the Southeast, that a lot of the issues that are prevalent up there are not going to be that common here, and so, you know, where you see a lot of problems, in the Northeast, is where you have fairly abrupt habitat changes that are kind of related to how glacial retreats happened and how they changed sediments. The glaciers didn't come down this far south, and so we largely have just flat, featureless sand, you know, compared to many of the areas in the Northeast.

My honest feeling is that the EFH impacts from the windfarms themselves is lower here than what GARFO is used to seeing. Now, when we talk about the export cables, that's a whole other issue, but, you know, we haven't really had to wrestle too much yet with an export cable, and so, as long as these kind of stay away from the hardbottom, which they are motivated to stay away from the hardbottom anyway, for their own economic reasons, and, you know, we're kind of looking at the world through the same lenses, but, when you start talking about marine mammals and endangered species, and you talk, in particular, about the North Atlantic right whale and its calving area and

its migrating area, and it all runs right through all these windfarms in the Southeast, my personal prediction is that's where you're going to see most of the contention, is going to be on the marine mammal side.

MS. CROWE: Wilson, go ahead.

DR. LANEY: Thank you. I would pretty much concur with what everybody else has said, and in particular with respect to the tide gates being problematic, from an access perspective, and, in some cases, that could be for river herring, which a lot of us has been working for a long time to try and get restored, and don't seem to be making much progress, particularly in the South Atlantic.

One other thing I will mention, and I think Anne is probably aware of this, is that, in northeastern North Carolina in particular, where we have a lot of large corporate farms, there is some new discussion, in particular with respect to water management, I guess, at Pocosin Lakes and Alligator River National Wildlife Refuges, and maybe more up the coast than Alligator River, but about changing the configuration of some of the historical ditches and making them sort of a two-step, and I may not be using the right term, Anne, and I'm sure that you can correct me for the record here, but they're sort of like bench channels, and the idea here is to benefit water management, by having, you know, flooding that might occur at two different stages, so that -- If you can envision kind of a stair-step kind of thing.

The upper step would then have emergent vegetation on it, and potentially even be usable by river herring for spawning, and, of course, it's highly complicated, because of the hydrology of these systems and the fact that you don't know, necessarily, how much rain you're going to get when, and you don't even know if you've got a viable river herring run in those areas, and then, if you put a tide gate at the end of it, that then creates additional complexity, and so I will just throw that one out there as a possibility, and I don't know how widespread that is.

I know that, in South Carolina, for many, many years, you all have had rice field trunks that are essentially tide gates, and some of them I think allow -- Certainly they allow ingress by larval and juvenile organisms, which then proceed to grow up in the rice field impoundments, and whether they get back out again or not I don't know, and I know there was some effort, a number of years ago, to try and make those kind of bidirectional, and so, whether that falls into the tide category, I don't know, but we might want to consider that as well.

Then certainly I would agree with Pace about the offshore stuff, and I think marine mammals and protected species, Atlantic sturgeon in particular, are going to, you know, require a lot of attention, and, again, I think, based on recent conversations with some of my New England colleagues at the ASMFC meeting in Beaufort, a week or so ago, the issues in the South Atlantic hopefully will be less contentious, and egregious, than they will be in the Northeast, simply because there are so many lobster fishermen up there, you know, and it's a huge number of traps and pots and challenges, in terms of how to manage those to try and get rid of as many vertical lines as possible, and I think that's it. Thanks.

MR. PUGLIESE: That was some excellent discussion, because the whole intent of this kind of discussion is to focus on opportunities to advance these, with some of the frameworks that you already have in place, and so there is climate variability and fisheries policy, and we specifically could begin to address some of the hardening in that whole issue, because I think that is really

significant right now, because everything is looking at resilience and looking at all of these to make sure that you're not reinterpreting or using things that are going to be really problematic for the EFH, and so the opportunity is the priority to begin to look at that and address this issue that is what comes out of this.

The other one is you do have a standing policy on alteration to riverine, estuarine, and nearshore flows, and so the whole discussion on tide gates can be a focus, again, as an addendum or a modification there, and so, again, the opportunity to relook and focus on those discussions, and so this is exactly what the intent of this kind of discussion, is things that are in the background, opportunities to build from where you are, and, you know, update beyond here, and then you're already working on energy, and so I think advancing some of those discussions we had here are going to be part and parcel of that whole discussion.

MS. CROWE: Go ahead, Wilson.

DR. LANEY: Thanks, Madam Chair, and so one more little parenthetical comment on the water management stuff is that, and some of you from North Carolina are well aware of this, is that, many, many, many years ago, before NRCS, there was SCS, and one of their missions was to provide agricultural drainage, which they did through a very successful, I guess, from their perspective, PL566 project, which resulted in some counties in North Carolina, and Pitt comes to mind in particular, having very few, if any, unaltered stream systems, because most of them were channelized with what is called a travel way adjacent to them, which took out a lot of the riparian vegetation as well, and so it really had a significant ecological impact on those systems.

What was somewhat disconcerting to some members of the agricultural community was that, because of that channelization, they discovered that their water table dropped rather dramatically during some periods of the growing season, when they didn't want the water table to drop rather dramatically, and so they wound up going back in and putting in literally inflatable dams, in some of those systems, to try and raise the water table back up, and how much the legacy of those sorts of projects is still there with us, I don't know, and I know that some of those systems have --

Due to lack of maintenance by the federal agency that created the project in the first place, they have sort of naturalized and reverted back, and whether there's been any sort of studies on those or not, I don't know, but that's something we might want to, you know, throw out there that we may want to look at, and, again, I think it was probably more of an issue in North Carolina than it was in other southern states, South Atlantic states, but I may be totally wrong about that, and I don't know, and I haven't taken a hard look at the record on PL566. It was a national program though, and so it could be that it's a problem -- I will defer to Paul about Georgia, and Stacie about South Carolina, and David about Florida, if that's an issue in any of those South Atlantic states, and I don't know.

MS. CROWE: Thank you, Wilson. All right. That was good discussion, and, in Pace's talk, he touched on the role of the council in determining EFH and the importance of having good source documents, and that kind of leads us right into our next topic on the agenda, which is our NOAA Fisheries EFH Five-Year Review.

If you recall from the spring meeting, Cindy walked us through the regulatory requirement for the councils and NMFS to periodically review EFH information once every five years, as part of

fisheries management plans, and we know that our next review is due in 2024, which is a couple of months from now, and so, with that being said, in the spring, we kind of talked through some ideas and came up with what I think Wilson termed as a lean-and-mean plan to get our review completed in the short timeframe that we had.

What we identified were three focus areas for review, and those were the buttonwood clarification, the limited FEP II and prey availability update, and then -- I guess that included a prey matrix, just to be clear on what that was, and then we had the tidal boundary subcommittee, which was looking at where the tidal freshwater line is in our coastal rivers in all of the states in our region. I think we do have updates from the different subcommittees on that, but I think, before we go to the updates, we were going to take a short break, and so it's 2:25. Let's say fifteen minutes, and so 2:40, and we'll see everyone back here.

(Whereupon, a recess was taken.)

MS. CROWE: Okay, and so, once again, we were going to start with updates from our subcommittees for the EFH five-year review, and so our first subcommittee was the buttonwood clarification, and that is Simen, who is online.

DR. KAALSTAD: I apologize for the lack of visuals and the overall dull presentation here, but, given the relatively short nature of the EFH designation for this species, I didn't want to overdo it, per se. I mean, primarily, just a preliminary paragraph or something would be where the two were clarified, that buttonwoods and mangroves sort of have the same functions, relatively speaking, and, based on my conversation with Pace, it seemed like the intention for the clarification is just also to have this EFH users guide align with the habitat plan.

It almost seems like it needs to be a little bit more of a conversation than me just walking through this, but it seems like the intent would be to essentially add, for the snapper grouper category, to just simply state, you know, "and buttonwoods", but maybe a tiny bit of clarification would be necessary, and so I'm sort of open to suggestions, but, primarily, this document just shows -- It kind of highlights the similarities and, again, emphasizes that buttonwoods are not necessarily a true mangrove, but they do function the same, and so they share several similarities, in terms of ecosystem services and their value to habitat, especially in coastal ecosystems, and so, while buttonwood is not a true mangrove species, and they are different taxonomically, they do often coexist with mangroves.

Usually mangroves do dominate, but there are cases where buttonwoods are the dominant vegetation along the marsh banks or the coastal shoreline, and so they do play an equally crucial role in supporting coastal environments. I would say, for the sake of the EFH user's guide, that the primary similarity between the two is that they both serve as nurseries for several ecologically and commercially-important fisheries, and then I guess, on the abiotic side, they function as natural buffers against coastal erosion, and storm surges as well. If you scroll a tiny bit down, it's just sort of very high-level similarities continued between the two.

I guess my question is how do you all foresee this information being included in the user's guide, because, you know, there's not a lot of literature included, and so I don't want to make it a research paper on mangroves and buttonwoods, nor do I want to sort of make designations without having any sort of scientific support, and so, primarily speaking, I would say the easiest solution is to just

add "and buttonwoods" in those areas where mangroves are suggested as essential fish habitat, and I guess I'm open to any questions, or any sort of direction, for how this may be implemented.

MR. PUGLIESE: Thanks, Simen. I think what you have created right here, and I was just talking with Pace on it, is really what we were trying to get to, is to be able to incorporate this type of terminology directly into the user guide, and so it clarifies that, when we're talking about mangroves, we really are also talking about buttonwoods as part of that package, and that's the whole point of the user guide, is to not only present the baseline information, but clarifications exactly like this, and so I think this gets to exactly what we were trying to do.

DR. KAALSTAD: All right. I also do want to note that ASMFC has worked on a similar sort of our version of the EFH document, called the Fish Habitats of Concern, and I know that Pace was instrumental in helping get that put together, as well as Wilson, who is there, and that was recently approved, although there is a tiny, tiny clarification on the striped bass section, and so I did want to mention, and that was sort of working on a similar thing, and, again, thank you, Pace, and thank you, Wilson, and, if there's anyone else that I'm missing, I will get that document together, and so we're sort of dealing with the same sort of clarification.

I do want to mention that I did add -- I had references that are more specific to mangroves and penaeid shrimp, but they are from the Gulf coast, and I can forward that to you guys, and I just remembered those articles yesterday, when I was kind of getting ready for this, but those are more in the context of mangroves and shrimp in the southern parts of the states in the Gulf of Mexico, but, ecologically speaking, it sort of highlights the fact that penaeid shrimp are very affected by the shifts in habitat type, and so, in the context of the Gulf, what does it mean if -- Are they completely taken over by this woody mangrove species, and the penaeid shrimp are very clearly demonstrating preference for one habitat or the other, and so I guess, in this context, in terms of coastal development and in terms of any kind of EFH consultations, I suppose, you know, the alternative habitat type would be no habitat, but shrimp are very reliant on those marsh grasses. That's just a paper by Scheffel, or two papers by Scheffel, actually, but I can answer any questions, but it's a pretty short clarification.

MS. CROWE: Thank you, Simen. Does anyone have any comments on -- Go ahead, Wilson.

DR. LANEY: Thank you, Simen. Did you have any insight into when the fish habitat of concern document will be available?

DR. KAALSTAD: So I spoke with Toni Kerns yesterday, and I believe you were in the same meeting with Lynn and Jim, and it was sort of tackling the striped bass clarification, and I would imagine that it wouldn't be more than a week or two, and the only thing is just looking into some of the information, and we're waiting on Marek Topolski, from Maryland, to sort of add his revisions to what Jim has provided, and so I'm sort in the process of boiling that down.

You know, the striped bass section of the FHOC document was originally maybe two paragraphs, and what I was sent yesterday was like a four or five-page document that read kind of like a book report, and so I'm waiting on a couple of revisions from Marek, and then I'll try to boil it down and see if they have any issue with that, and, once we sort of agree, myself, Lynn and Jim, on what the striped bass section looks like, I'm going to send it back out to the Habitat Committee for a

last glance, and then we will get the final version out, and so by the end of the year definitely, and let's hope by the end of the month.

DR. LANEY: Okay. Thank you. That sounds good, and, just FYI, I'll be seeing Jim in a couple of weeks here too, and so, you know, hopefully we would have all of this resolved before then.

DR. KAALSTAD: Yes, and I think it was just a matter of making some of the habitats more region-specific, to at least the Chesapeake and Maryland state waters, but the information remains the same, and so it's just a matter of condensing it down without losing any value.

MS. CROWE: Any other comments about -- Go ahead, Anne.

MS. DEATON: I just have a question on the buttonwood. The way I -- From what I know, they're more like just a -- They're like a high-marsh-type species, and they're usually like right above, or next to, the mangroves, and so are they considered -- Would that be a problem for EFH designation, is what I'm asking, or maybe -- I mean, maybe they're intermixed more than I picture, and is it intertidal, or is it a wetland species? Is it okay to be EFH, because, I mean, people have them on their -- They plant them in their yards too, and so they're kind of like -- What would you call that, a facultative wetland species?

MS. CROWE: I think that's a great question, but I don't know the answer.

DR. KAALSTAD: Actually, to your point, and I was actually just in Florida last week, sort of connecting through Miami, and I spent the day there, and, just driving around town, I realized that, wow, they have a lot of buttonwoods everywhere, and I was seeing them in people's yards, but, to your point, they do go further inland, and you don't typically see them as much in the intertidal zone as you do with mangroves, but it's not impossible, and I think, for the sake of further clarity maybe, it would be necessary to add a sentence or two, you know, sort of describing that they --

When they are existing in the intertidal area, they sort of prevalent over mangroves, and they do exhibit sort of the same functions, although not as often, and you might not see, you know, intertidal buttonwoods dominating as often you do mangroves, but it depends on the nature of the activity as well. It's usually if, you're know, digging, and you're bringing with you some of the higher marsh as well, and so, again, it's open for discussion, because, yes, buttonwoods are tricky. They're like a sneaky mangrove, and they're not considered a true mangrove on the physiological side, but they do function as the mangroves do, and so they are important, but they're just not as often seen to dominate the intertidal zone as the mangroves are.

MR. WILBER: So there's like an overall governing thing on EFH that's in the designations that is the maximum extent of the tide, and that's up rivers, but it's also up into the uplands, and so the way we would interpret that is like, if the buttonwoods are within the intertidal zone, they are treated the same as mangroves, but they have to be within the intertidal zone.

DR. KAALSTAD: Right, and that was my understanding as well.

MS. CROWE: So do we need to clarify that in the paragraph then, that it's only buttonwoods occurring in the intertidal zone?

MR. PUGLIESE: I think this is connected so closely with the other part, where you're designating what those upper bounds are, and I think that's what you are doing.

MS. DEATON: I just googled a Florida plant atlas, and it said that they're an obligate wetland species found around -- Here it is. Occurs almost always under natural conditions in wetlands, facultative wetlands, and it usually occurs in wetlands. It's a wetland species. Let's keep it.

MR. PUGLIESE: Like I said, I think the reality is that you have built this, in terms of clarification of what it is, and you're going to designate where the upper bounds are, with the other actions that we're going to be talking about a little later on, and so you're kind of shoring up any of those questions, in terms of extents, I think, and so I don't know if you need to actually specifically say it in there, and I think it's inherent with the next step that you're going to talk about, in terms of the boundaries.

DR. KAALSTAD: Right, and it's funny that you say that, because I did have a sentence in there that said that, while they occur further upland than mangroves do, yada, yada, and I was like let's just -- I kind of took that sentence out, but, again, I'm going to defer to Roger's opinion.

MS. CROWE: Okay. Sounds good. Anything else on buttonwoods? Kathleen.

MS. HOWINGTON: Sorry, and just for me, because I'm taking notes, and your audio sometimes got a little garbled, the main recommendation here is to include this wording into the user guide, which would then designate buttonwood as a mangrove, and therefore an EFH, correct? That is the recommendation?

DR. KAALSTAD: Yes.

MS. HOWINGTON: All right. Thank you. Just making sure.

DR. KAALSTAD: Sorry. If you guys can't hear me, let me know. I will try and speak up a little bit.

MS. HOWINGTON: You went in and out, and so I was able to get like 90 percent of it, but it's just I was making sure that I had -- Because the recommendation is big for the record, and so just double-checking.

MR. PUGLIESE: An additional word is a clarification that's going to be integrated, and it's not a new designation, and it's a clarification of what mangroves mean under the EFH designation.

MS. CROWE: Okay, and so we're good with buttonwoods, and then let's move on to the next subcommittee, which was the limited FEP II update, which included prey and references, and that is Wilson.

DR. LANEY: Thank you, Madam Chair, and so I am going to report that we have nothing to report at this particular moment in time, which I explained to Paula is because I've been -- My attention had been diverted to working on Atlantic sturgeon fish habitat of concern and striped bass reports to Congress and a few other things like that, which have diverted my time, but my intention is, with our small group who will be working on that, to hopefully work closely with

Lauren Gentry at the Florida Fish and Wildlife Conservation Commission and try and update the predatory-prey section in particular.

I know one of the things that's evident, if you follow stock assessment processes, is that some of the species that were principal prey in the past are not nearly as abundant as they used to be, and so whether or not there is a lot of literature that shows us that some of the predator species are rather plastic in their diet, and able to adapt and eat other things, I'm not sure, but that's the sort of thing that I think we'll be looking for, among other things, and so hopefully, between now and our next meeting, we will make a tremendous amount of progress.

MS. CROWE: Okay. Thank you, Wilson. Does anybody have any questions for him? None? Okay. Roger.

MR. PUGLIESE: Just a follow-up, and some of our contortions here is that transition with Cindy leaving, and there was going to be a lot of follow-up, and we just didn't have a chance to do a lot of this stuff, and I didn't want to emphasize too much about how we're moving forward, and you do have some time, because this will be completed in 2024, and so the good news, on Wilson's side, is that he knows that the whole matrix just needs to be refashioned into how it connects to our managed species, because, you know, the lion's share of information is there, and so that's going to be a good thing, but I just wanted to kind of just temper it a little bit, because I think everybody did what they could to get forward on this. The opportunity now is to, you know, move beyond here, and everybody is heading in the right direction, and, again, the good news is a lot of things are there, and so you'll be able to further it quickly.

MS. CROWE: Great. Thanks, Roger. Next up is Casey and the tidal freshwater boundary sub-committee.

MS. KNIGHT: Awesome. Thank you. Well, not to disappoint you and make you look bad, Wilson, but my committee also did not meet. We were able to email a couple of times, and so really what probably is going to happen here today is probably the initials of what a sub-committee meeting would have looked like, and so, really, what I have done, since I inherited the tidal boundary, or the head of tides GIS layer from NOAA's Biogeography Branch -- Remember that I was nominated to run this sub-committee under duress at the last meeting, and so we'll just kind of go through what I've got, and we'll see where the discussion goes from there. Thankfully, like Roger said, we've got a little bit of time to continue to work on this.

Just to kind of update you guys again, like we talked about, really the exercise here is to try to designate that upstream tidal boundary for the essential fish habitats in the South Atlantic, and we discussed using the head of tide, and the head of tide is the tidal limit, or tidal head, and it's the farthest point upstream where the river is affected by the tidal fluctuations, or where the fluctuations are less than a certain amount, and this applies to any of the rivers that flow to the tidal bodies, such as ocean bays and deltas.

In this nice very small table that you see here, it basically has the GPS coordinates and the locations for each water body within the southeast region that I had available. Stacie was able to provide me with the South Carolina -- The U.S. Corps of Engineers Charleston District navigability study from 1977, which also had some river miles, which I just did some quick tabletop calculations, and it looked to pretty much line up pretty well with the points that we've got, and then I put

together, with Chip's help, this interactive map, where we can actually go in and look at the different EFH layers and the points marking the head of tide for the different water bodies.

Before we get into playing with that, let me go back to the presentation here and just kind of go through some of the questions that we need to answer, looking at the interactive map, and so the first question is, you know, basically, are we comfortable using what we consider the head of tide in these kind of approximate locations as the upstream tidal boundaries for EFH, and then there are a couple of water bodies that don't have approximate indicators for head of tide, and so how are we going to deal with those?

Then the one thing that I didn't have here, that I added to the presentation later, is there's actually a couple of occurrences, especially with the shrimp EFH, that goes above where these tidal indicators -- Where the tidal boundaries are indicated, and so how to deal with those, and then, finally, what are we going to show if we do decide to include this in the five-year review, and how are we going to include it, tables, coordinates, static maps, and so that's kind of the presentation, and then we can kind of go back and look at, you know, any of these areas and the discussion, and I will kind of leave that up to the committee now.

AP MEMBER: Thanks for the presentation. With respect to the second bullet point on your discussion slide, how do we address water bodies that do not currently have an approximate indicator, how many are we talking about, what proportion-ish?

MS. KNIGHT: So, obviously, I'm much more comfortable with North Carolina and our water bodies, and so I know, in North Carolina, the Pungo is really the only one that's missing one, and it looks like there are several in South Carolina, just me eyeballing it, and it looks like most of Georgia and Florida are pretty well covered. Wilson.

DR. LANEY: Thanks, Casey. Great job putting all this together, and, to your point about the penaeid shrimp and, you know, the possibility that they may, in some cases anyway, extend above head of tide, I was going to ask, and are there other species that are council-managed species, aside from penaeid shrimp, that we know go further upstream? I mean, I know, on the Roanoke, striped mullet, at least one of the flounder species, and I don't know whether it's southern or summer, but we do see those, you know, way upstream, above head of tide on the Roanoke on occasion, but those are not council-managed species, and so I guess we don't have to worry about those at the moment, and is it just shrimp, as far as we know, is the only one that may --

MS. KNIGHT: So the three that I see as possible issues are definitely shrimp, and I will just kind of show you here, and shrimp is definitely -- You know, it can be an issue, especially down here, where it shows snapper grouper essential fish habitat, you know, almost to Fayetteville, and so that's kind of -- These are kind of the issues that we need to decide, is, you know, is that really what we consider essential fish habitat all the way up that way for snapper grouper.

DR. LANEY: Yes, I agree, and I guess that is just one of those things that we'll just have to vet and try and figure out. As far as the snapper grouper complex goes, gag is the one that comes to mind, you know, that would be the most inland species, but I don't think it would go almost all the way to Fayetteville. We found them on the Cape Fear, like eight miles up the river, because we used to catch them on the screens at the Brunswick Steam Electric Plant there, and so certainly the

estuaries, which fall well within the head of tide range, but, other than gag, I'm not aware of any of the rest of them that really show up that far upstream.

MR. PUGLIESE: The reality is that these are guides, and I think there's going to have to be some, you know, ultimate flexibility, and maybe Pace could weigh-in, because the whole idea was to at least get some clarification on a little firmer information, but I think the consideration is that, while this gets put in, and the whole idea is that you want some of this clarification directly in the user guide, so that, when you look at it, you add some boundaries, but the real focus is, as you move into the future, there are going to have to be considerations on, you know, the dates of some of these points, and different things like that, because of some of the changes that probably have happened since sea level rise and different things that are shifting.

I think the best you can do is create the baseline and then evolve with it. If Pace has a better idea, but I think this gives you, you know, what was totally a nebulous kind of thing, other than just wording, but some baseline to start with.

MR. WILBER: So, I mean, our request, our desire, to kind of have this clarified is kind of two-pronged. You know, one is purely a communications issue. I mean, the designation says to the maximum extent of the tide, and we all know that the tide -- To measure the tide, you have to make some technological constraints, you know, like how much of a variation we're looking for, and I've worked with the Office of Coast Survey, and they have like their official tide gauges, and then they have a network of unofficial tide gauges that are farther inland than the official gauges, where they are waiting to see if they can see a regular enough fluctuation, in order to claim that area as being tidal, but they are seeing a tidal signature in those areas, and so my question has always been, for the council, like, you know, white shrimp is sort of the marquee species for all this, and it's like do I find any hint of a tidal signal and call that EFH for white shrimp, or do I need some kind of practical kind of filter for it?

Then the other question too is like is this really just an academic exercise, and does it really matter that you go to -- What's that power plant on the top of the St. Johns River, you know, where they find white shrimp every once in a while on the intake screen? I mean, it's 180 miles from Jacksonville, and, I mean, was it really the intent of the EFH designation to go that far up the St. Johns River?

What I'm really kind of looking for is like what's the intent of the EFH designation, and how far upriver are we really going, and, if that's clear, then I have something that's a lot more mappable, and I have -- Because it's mappable, I can communicate it better. Then the other side of why we're interested in this, and that came up during my presentation, is, with all the sea level rise going on, is the EFH moving upriver or not, just from a strictly scientific perspective, and is it or not, and what rivers is it moving up the most, and how do I become aware of that, and how do I implement that in my program?

MS. KNIGHT: Real quick, and, to that point, I meant to mention that, obviously, these points were mapped out in the late 1990s, or early 2000s, and so there's already a little bit of time on them, and then, obviously, depending on the gradient of the system, and the impacts downstream, like harbor deepening and stuff, you know, how far that tidal influence -- You know, that can change, and so, you know, keeping these EFH above that, you know, obviously lends towards that migration of those habitats, too.

MR. WILBER: I will note that I can still use the Fish and Wildlife Coordination Act to comment on anything, all the way up to the mountains, and so it's not like they lose their protection if we pick a particular bridge, for communication purposes to the public, and say the upward limit of EFH happens to be this bridge.

MS. KNIGHT: Something that also might be interesting to look at with those maps is looking at your presentation earlier and what you all have commented on, and looking at those green dots, compared to those gray dots, and seeing where they fall on these lines as well.

MR. WILBER: Yes, and so I didn't really mention it, but you can see that the dots, or the EFH consultations, really coincide with population centers, and so, the rivers that you don't have a report of where the head of tide happens to be, those are probably not going to be population centers, you know, and so the consequence of just leaving that best professional judgment, on a case-by-case basis, is not going to be huge, I mean, because we're not going to get a lot of consultation requests there.

MS. KNIGHT: Some of the South Carolina people might be able to speak to it better too, and I also had questions about some of the ones that were marked, and they might just be completely tidally influenced, and so there might not be a head of tide, because they're just shorter, smaller systems.

MR. MILLER: I would agree with Pace that you wouldn't want to go all the way to Lake Monroe essentially to identify essential fish habitat, but you do get a number of estuarine species that go up there, and, actually, I think some reproduce there, like the naked goby, and we have some stingrays.

My question is about American shad, and they go far beyond that. There are some areas that can clearly be identified as major spawning habitats for this species, which is in decline in the river, and is that addressed? I mean, that's essential fish habitat, but it's only used a few months of the year.

MR. WILBER: So we'll get to Wilson, I guess, but so the problem with American shad is they are not a commission-managed species, and, in order to have essential fish habitat under the Magnuson Act, you have to be a council-managed species, and they're not managed by the South Atlantic Council.

MR. MILLER: I thought they were managed. They have an American shad management plan at the --

MR. WILBER: The commission does, but the council doesn't. I misspoke in the beginning, and I said -- You always have to keep council and commission separate from each other, even though they share the same letters in their acronym, and it becomes very complicated.

MR. MILLER: Well, rats.

MR. PUGLIESE: Just quickly, I mean, we've highlighted those in the habitat plan, and into the Fishery Ecosystem Plan, about the importance as prey for managed species, and so I think there is

linkages that I know have been picked up, but, in terms of actual designation for their habitat as EFH, under the way Magnuson is right now, we can't do it, but we have highlighted how important they are to the overall system and the connections that do -- Those get picked up by Pace and the Conservation Division.

MS. CROWE: Wilson, did you have something?

DR. LANEY: Pace touched on it, and Roger touched on it, and what we did was -- So, technically, and this is based on my discussions with NOAA General Counsel, is the diadromous species, or at least the anadromous species, and I'm not sure about American eel, are included in the Magnuson-Stevens Act, and, as Pace pointed out, the catch-22 there is that you can only designate essential fish habitat if there is a federal fishery management plan, and there isn't, because ASMFC is not a federal agency, even though it was created by Congress back in 1942.

The dilemma we faced, when we did the 1998 fish habitat plan, was to describe what would be essential fish habitat for those species if a federal plan was ever prepared for them, and it never has been, and so that's why Pace came up with the concept of this fish habitat of concern document, which we worked on for quite a few years, or, actually, over a decade, I think, probably, that Simon referred to earlier, and so that document now basically sort of picks up that same concept of identifying what meets the NMFS definition of essential fish habitat, but calls it now fish habitat of concern, to try and avoid some of that confusion, because, when ASMFC makes a designation, there's no regulatory consultation requirement for it.

It's just information that we're putting out there for regulatory review folks and interested stakeholders to say, hey, these habitats that we have documented being used by these species are very important, and essentially equivalent to essential fish habitat, but there's no consultation requirement, and you're absolutely right about American shad. They used to go up the Roanoke River, all the way to Salem, Virginia, before the hydropower dams were constructed on that system, and so, you know, we can certainly have some further discussion, and it would be interesting to have some further discussions about, you know, whether or not there should be a federal plan for those species or not.

Some of the councils, including the South Atlantic Council, in their 1998 fish habitat plan, but also the Mid-Atlantic Council and the New England Council, have all attempted to put management measures in place that address the impacts to these anadromous species, especially river herring and American shad, which are impacted by the Mid-Atlantic -- By mid-water trawl fisheries in the Mid-Atlantic, and also by the Atlantic herring fishery, and so it's not like, you know, they've been completely ignored, and they haven't been. They are trying to address the management of those species and reduce the impacts that occur to them, and there are unintended impacts. I mean, these fisheries are targeting other species, and they just incidentally pick up river herring and shad as bycatch, and so it's complicated, as always.

MR. WILBER: I just want to add one thing to that. I remember, ten years ago, the Pew Commission was putting a lot of pressure on NOAA Fisheries to designate EFH for prey species, and the outcome of all of that Wilson summarized, and, you know, our council basically told us that there is no fishery management plan for prey species, and fishery management plans are the vehicle for designating essential fish habitats, and so you can't go that next step.

There are some sort of ways around that, and, you know, one of them is that you can look at the estuary and say, well, the estuary is clearly essential fish habitat, and why is it essential fish habitat, and, well, one of the reasons why it's essential fish habitat is the supply of food to the estuary, and much of that food comes from shad, American eels, you know, and other things that are up in the river, as they're kind of migrating towards the estuary, and so we have said that a particular action way upstream, including FERC dams, FERC-licensed dams, are affecting essential fish habitat, because they are diminishing the supply of food to the estuary, you know, because of the way they operate that particular dam.

We've used even that same logic train when we talk about sound impacts. You know, people drive pilings all the time, and does a piling really affect essential fish habitat? You know, probably not, especially if you quantify it on an areal basis, but, while the piling is being driven, it is putting out a pressure wave, and that pressure wave is basically chasing fish out of the essential fish habitat, and so that marsh, or that intertidal area, or that seagrass bed that's nearby is not able to perform its function, because the pile driving is chasing the prey out of there, and so we use that train of logic to put EFH recommendations on how pile driving is done, to minimize the amount that happens, when it happens, during the time of year and stuff like that, but, you know, if somebody could wave a magic wand and create a fishery management plan for prey species, that would be really great, but we don't have that wand.

MS. CROWE: Paula, go ahead.

MS. KEENER: Thank you. Kevin, I cannot remember, and were you at the MAC meeting a couple of weeks ago? Okay. At the South Carolina Department of Natural Resources Marine Advisory Committee meeting, a couple of weeks ago, there was a presentation on flounder, and I don't remember which species it was right now, and I can probably go back and find it, but various life cycle stage, life history stages of the flounder, go way, way up, and is anybody aware of this, other than me, at this point? Do you know what species it was/

MS. CROWE: It's probably southern.

MR. WILBER: Yes, and summer flounder too, but southern flounder are the ones that go super far up.

MS. KEENER: Summer or southern?

MS. CROWE: Southern.

MS. KEENER: Southern. Okay. All right. Thank you.

MS. CROWE: Wilson.

DR. LANEY: So I originally raised my hand, a while ago, to address a different topic, but Pace diverted me there to one of my pet topics, which is diadromous species and EFH. The question was, and I think Casey touched on it, is, you know, we all know that sea level rise is coming, and it's going to have an impact, presumably, on EFH, in particular, as it changes the salinity regimes in these river systems, and I just wanted to mention, and I think I had mentioned it before, but I, and colleagues, are working on -- We're doing a project that is funded by the Climate Adaptation

Science Center at NC State on the Roanoke River, where we're looking at the hydrology of the system, and various climate change scenarios for the future, to try and develop ecological thresholds for the diadromous species, but also for the riparian forest itself.

That work is ongoing, and it will probably be coming out in another year or so, and we haven't added salinity in as a metric of interest, but we've had some discussion about it, and so we might possibly be able to do that. Our overseer, the principal PIs on this, are Julie DeMeester at The Nature Conservancy and Simian Yurek at USGS in Gainesville, and Simian is trying to keep us very focused and on task and not get diverted by things like should we be including salinity as a metric, but, you know, we might be able to sneak some other things in there, and it's the kind of study I think that would be very useful on other rivers as well, and so maybe it will serve as a template for us to be able to go back and look at some of these things at some point in the not-too-distant future.

MS. CROWE: Thank you, Wilson. That would actually be great, and I think any additional data we could get to solidify where these markers are would be really helpful. I know one thing that we talked about, in the spring, was having a physical marker, and I honestly just don't know how we would do that, because that would be such an undertaking, and so it looks, to me, like as far as what to include in the EFH five-year review, it seems like the most practical thing would be the table with the GPS coordinates. That way, as Roger mentioned as well, we can adjust those limits as we get additional data, as things change in the rivers, and I don't know, and does anybody have any input on that, any comment, or anything else, Roger, that you want to --

MR. PUGLIESE: I would just pretty much bounce it to Pace, because, I mean, I think, you know, the whole point of making these modifications, making these clarifications, is to enhance the utilization, or the utility, in this process, and is this something that would at least create the baseline from which then to revise, because I think we're going to get into some discussion later on that maybe we have some avenues to do it, with our partner -- Rua Mordecai is going to be presenting on SECAS, and all the work that's done on river flow and water and species utilizations, and there's an amazing amount of opportunity that maybe will provide an additional stream, or an additional opportunity, to do this. I think what we need to do -- The question is would this provide a baseline from which to then advance, and does it address the need, or the request, that's been made.

MS. CROWE: Go ahead, Pace.

MR. WILBER: The short answer is yes, and that would be really helpful, and, you know, we would put it on a GIS somehow, but, yes, it would be really helpful to have that table fleshed out and reviewed.

MR. PUGLIESE: A follow-up before -- I know we have multiple questions, and I think that would provide -- We've been building all the EFH, and now, again, these are just reference maps, and our EFH maps, as you know, and you've made it clear in the past, the wording is the foundational information for EFH, but we've created all those EFH layers, and we assume that then there could be some adjustment to some of those layers or whatever, relative to what these boundaries are, and then, again, shift as needed, based on state input, or other input, that can be collected. Does that sound good?

MS. CROWE: Anne, did you have your hand up? Go ahead, Wilson.

DR. LANEY: Well, pursuant, again, to this whole question about how things may change in the future, a recent example popped into my head, and this is somewhat along the lines of what we're talking about, relative to species that may occur, in the future, in areas where they don't presently occur to such a great extent now, and the example that comes to mind is the recent proposed green sea turtle critical habitat proposed rule, I think, Pace, but, anyway, the question there was should Albemarle Sound be included in that critical habitat designation, and NMFS Protected Resources elected not to include it, because the density of green sea turtle juveniles is pretty low in Albemarle Sound, at present.

At least one conservation organization that commented on their proposal suggested that it should be included, and the reason being twofold, and one is that the use of large-mesh gillnets, which are one of the entangling gears for juvenile green sea turtles, is more intensive, within eastern Albemarle Sound in particular, than it is in Pamlico Sound, which is being proposed as critical habitat, and then the other argument they put forth is that, well, we have rising sea level, and a salinity regime that's likely to continue to change in Albemarle Sound, to make that habitat more attractive to, and more utilitarian for, green sea turtle juveniles.

That may be something that we should think about, as we're going through this exercise, and I guess, right now, the only two species, and, Pace, correct me if I misspeak, but summer flounder has EFH, and the penaeid shrimp have EFH, and are those the only ones that we should have a concern about, you know, A, going upstream beyond the head of tide, but, B, also being even maybe positively affected by sea level rise, because, if the salinity regime continues to increase further upstream, then habitat for them would expand, similar to these arguments that were being made for green sea turtle critical habitat. Any thoughts on that?

MR. WILBER: In a practical sense, penaeid shrimp is the one that really drives most of this discussion. Summer flounder is an important add-on to the discussion sometimes, but we have to remember that summer flounder are designated by the Mid-Atlantic Fishery Management Council and not by the South Atlantic Council, and so we don't spend a whole lot of effort worrying about Mid-Atlantic EFH designations that encroach into our area. We should be spending more effort on it, but, honestly, we don't. Then the third point is lots of strange things happen in North Carolina, and I would defer to Anne on what species are in places they're not supposed to be, according to the textbooks, in North Carolina.

MS. DEATON: Well, I thought, when we were looking at the maps, snapper grouper uses -- Palustrine wetlands is an EFH for snapper grouper, and so the maps would indicate that snapper grouper is maybe way up the --

MS. KNIGHT: It was the Cape Fear was the example that I used.

MS. DEATON: Fresher than we would normally use right now, but I was just going to add that maybe, just getting back to the coordinates, if that's helpful, that it might take some descriptive text to say that, since we don't have it for every water body, head of tide or the essential fish habitat or, or and or something -- You know, some documentation of the fishery species, and like have a little it's up to professional judgement, and add a professional judgment in there. That's all.

MS. KNIGHT: Pace, just for clarification, you said that you don't think that it would be important to go back and reidentify some of the areas that we know are missing, like say the Pungo?

MR. WILBER: The Pungo might be the exception, because we do have a fair number of projects there.

MS. KNIGHT: Well, good. That's an easy one. It's the 264 bridge.

MS. CROWE: Does anyone else have any other comments or input? Do you have anything else?

MR. PUGLIESE: No, and I think, you know, we've pretty much shored everything up, in terms of at least identifying how to integrate, and what can happen next is the discussion about actually putting it into the user guide and addressing it from there, because I think you've got two activities to complement each other that can enhance the clarification for both of these issues, and, as everybody has indicated, you know, these are evolving, and so making sure it's clarified in there that, you know, dependent on future sea level rise or climate issues, but this is where it starts, and then you go beyond that, and then making sure you do that, where there are other areas that may not have that boundary, what some of the qualifying issues are. With that, I think that accomplishes the request, and the need, and we can advance that and fill in those portions of the review activity.

MS. CROWE: Okay, and so it sounds like we're good with that, and we're ready to move on to the next one, which was an update on the climate vulnerability assessment overlap with EFH, and that goes to John, who is online.

DR. QUINLAN: Thanks for having me here to talk about this. The meeting has been great, and I'm going to walk away with many, many ideas about things we could potentially do with some of these climate models and approaches and things like that. Some of the things that I will say at the end, I think you're already thinking about, which is wonderful.

Getting to our review of the South Atlantic climate vulnerability analysis, fisheries vulnerability analysis, that was just completed, and I've got some comments on distributions and essential fish habitats and things like that, and Mike Burton is the person who was leading this one, and he retired just before Roger, I guess, and so I just wanted to have him here.

I thought what I would do is talk about what a CVA is, how it works, what some of the assumptions are behind them, and give you a better feel for what these things actually are, and I will do that throughout the talk, while I'm presenting the structure and the results and things like that, and so what these things are is it's a method using expert opinion and climate model projections to assess a species' environmental exposure and biological traits and sensitivity to expected climate change, and there is a methodology behind these things that is being used all around the country within NOAA Fisheries.

This thing provides a measure of what's called the relative vulnerability for a species to climate change, and vulnerability is related to reductions in a species' productivity and/or abundance in response to climate change, and so exposure -- As I use these terms, I want you to think about environmental conditions, and that's going to come from an ensemble of climate models, the average result of a bunch of climate models, and the sensitivity has to do with life history traits, and it's a scalar, or a categorical ranking, of where a species fits with respect to extremes for given

life history traits, and, if you take prey, prey, or feeding behaviors, and it would be the difference between say a full generalist and a full specialist, would be opposite ends of -- Or the extremes in that, and you have to figure out where a species is within that range, and there's a whole series of them for each trait that's used. Again, there's a few things that end up being in vulnerability.

This is sort of what it looks like, and so I just went through and I said the exposures, which are the environmental characteristics, and I've got a bunch of things listed here, and a lot of these were used in the CVA that I'm talking about, and then the sensitivity, and we used twelve of them, and the standard for the CVA is people can use them or not, and they cover things like dispersal and early life stages, adult mobility, habitat and prey specificity, pH preferences, thermal preferences, and that sensitivity to those two things, and then information about population growth rate and stock size and status.

Uncertainty can play into all this stuff as you're going along, and so things -- You know, some of this down here, some of these metric depend on things like how quickly the population is growing and what the stock size and status is, and the people who are doing the scoring may know those numbers directly, and they may also know about the uncertainty.

These two things are brought together, and there's kind of a multiplication that happens here, and you get the species vulnerability, overall vulnerability, and there's also vulnerability in the exposure term and the sensitivity term, and we'll present some of that stuff later on. This is supposed to go into informing science and management, and that's the goal of what these things will do.

On the environmental stuff, it's quantitative, in this case, and we're using climate model data, and the projections are good as we had at the time when this thing was run, and you need an estimate of species distributions, and you need to understand -- You need to come up with, or pick, an assumption about what the emissions are going to be, and this has changed a little bit in some of the newer models, and then timeframes for a reference period that you're comparing things to, and then a projection period, and these are relatively long blocks, and I will show you what they are in a second for this model, and things have changed a little bit later, and I will show a little bit about that, too. Then which environmental factors, and so you can use these, and you can pick some others that are regionally-specific.

On the biological side, it's quantitative, and it relies on expert judgment and group discussions, and they go through and do the ranking, talk to each other, come back and adjust their scores, if they want to, and Wilson was involved in this, and other -- Some of you may also have been, and so he's very familiar with what this part of it is. You need to pick out which species you're going to focus on, and, in the end of this thing, you have to collect what's known about the life history and ecology, because that's the information that you need to build out the scores for each of these sort of categories, and it would be great if you had stuff that was for say the South Atlantic. If it's not, you borrow things from somewhere else, which isn't ideal, but it happens a lot.

In this case, what we did -- There is a series of decision points that need to be made during this thing, and then there's how it's implemented, and so the scope of the project here is we had seventy-one different species, and those are picked from managed species to forage species, threatened and endangered, things like that, and there are seven environmental variables, and I will

show you those later, and there is twelve life history traits that I mentioned, and the domain for the project was the South Atlantic LME.

This picture on the left is not what the climate model that we used looks like. This is a brand-new one that is essentially an in-development model at the GFDL, and it's a wonderful model, and it's really interesting. The model selection that we used is something called -- It's part of the CMIP5 series of models, which is the last IPCC release, and not the most recent one, but the one before that, that class models, and then we used something called the representative concentration pathway, which talks about emissions, and that's 8.5, which is -- Some people describe it as status quo, but it's essentially what we have is what we're going to continue with, and we're not going to have mitigation and things like that involved.

There are other less-aggressive things that you could pick, and we can be critiqued on this, and this is sort of a pessimistic view of how things are going to go, and the people we were working with felt that way about this, and there are other -- Like I said, there's others that are lower, and some of them are very, very optimistic, and the truth is that, when you look at things like temperature for all these different pathways, the period of time of what we're looking at, there isn't much of a difference between the different pathways. It's when you get out to a hundred years or so when you start seeing things as being quite a bit different, and so it may not have mattered as much that we used this particular pathway.

The temporal scale, and so this is the historical period, your reference period, and then your projection period, and this -- The bottom should be 2055. The historical period that was available to this was 1956 to 2005, and so these are hindcast model runs, and what you're doing is you're taking the average of a bunch of different models, and it's the annual output of these models, and that's what you're looking at. There is some measure of variability in this thing that you can get to, and it's actually in the CVA, and I'm not going to present that, and that's used to talk about the variability that's present there, but this is your historical period, and then the projection period is this long period of time as well, and you're thinking about what's the average sort of condition going to be like during that reference period, and so it's not every year, and it's like this is what the condition is going to be like during this particular period of time.

That's what you have, and those things have sort of changed a bit, too, the sensitivity attributes that I mentioned before, and there's a manuscript that's available now as a NOAA tech memo. There is some new options, that I will talk about in a bit, and CMIP6 is available, and there's some other models that are out there too, which are really pretty interesting. The downscale on these models is also something that's fairly recent, and there was one area that could do this within NOAA Fisheries, and they did it. There is multiple what they call SSPs, and so I will pick that up in a second, but these are the replacements for these RCTs, these concentration pathways, what the emissions are going to look like.

These new things have more to do with how society is developing, and what they expect CO2 to look like during the process, and I will talk a little bit more about that later, and there is multiple time periods. Some of them are shorter, and some of them -- There is shorter, more recent things that you can use for the reference period, and they're shorter, and a series of different future periods that you can use, and so very interesting stuff.

This slide just says here's -- We went through and gave you what was involved in this thing, roughly what the environmental factors were, and the biological traits. This table, the environmental factors are in the top row, and the biological traits are in the bottom row, and then there's things that we consider and then the things that were determined to be most influential for the overall vulnerability of the species in the assessment.

The things we consider are, you know, sea surface temperature, air temperature, salinity, ocean acidification, precipitation occurrence, sea level rise. Most of these were available from the model itself, and I'm not sure we got -- We may have gotten currents, or, actually, I don't think we did, and the sea level rise also was something we didn't get from the model, and so those had to be developed externally, and those were ranked by the experts. The other things were fully quantitative right from the climate models.

Biological traits is the twelve that I had mentioned, and there's some other stressors here, which takes into account things not listed. The most influential things were sea surface temperature, and air temperature played a role in this, but I think there was some division in terms of how the scoring went on that, or at least the determination of ranking. The salinity, which was pulled in here, and ocean acidification, and so the pH change, and then the other things were population growth rate and stock size and status, and so those are things that were pulled out of this model as being the most influential, and there's a whole series of rankings of these things that you can look at in the memo to figure out where other things sort of play out.

The results, this is the overall -- What I'm going to say that I think of as sort of the major result from this, and so along the bottom -- It got cut off, but along the bottom are the exposures, the environmental exposures, and it's categorized from low to very high, and so conditions will be sort of the same, and conditions will be quite different, on the environmental side. On the sensitivity side, it's the biological traits and how those things were sort of ranked between those extremes that I mentioned, and you go through, and it's sort of a comparison between the exposures and the sensitivities that way, and then you look at the colors, and the green is low overall vulnerability, yellow is moderate, orange is high, and red is very high.

In the South Atlantic, which came out a little bit different than the Gulf of Mexico, environmental exposures were mostly very high, we had one for Atlantic sturgeon, where the environmental exposure was high, and the Gulf of Mexico had this, but it was -- The mixture was a little bit different. The biological sensitivities vary from low to very high, with most things ranging from low to high, and Atlantic sturgeon, again, had very high biological sensitivities.

The thing that's really kind of interesting is that there were -- So, overall, there were very high environmental exposure, and the biological sensitivity varies in this thing, and no species in here had low overall vulnerability, and so everything had moderate to very high vulnerability. The Gulf of Mexico had it a little bit different, and there were some things that had low. The species in this table, you will look at it, and they are sort of in rank order, and there's things in here with asterisks and bold, and that has to do with potential rank changes, and there's a bootstrapping sort of exercise that happens to try to figure out if the scoring would change anything, differences in scoring, and that's -- You can read about that in the tech memo, if you're interested.

Another way to look at this, and I sort of like this, and now these two axes are not completely independent, and so keep that in mind, and the overall climate vulnerability has some of the

components that are used to calculate the potential for species distribution change, all right, and so, at the bottom, it's the potential for species distribution change, and I will talk about the color-coding in a second, and, along the Y-axis, it's the overall vulnerability, and the colors along the Y-axis are what you're used to, and it's green to red, low to very high, and then, on the potential for distribution change, it depends on what your viewpoint is.

I color-coded them this way, and it's different in the tech memo, and Mike had a different viewpoint of this, but, for me, if something has a low potential for a distribution change, and it may be -- It may have more problems with climate change, and so I thought a low distribution change probability would be a risk factor, and then very high -- I felt that, if something could move around quite a bit, it would have less of a risk factor, and that's a problem if you're trying to manage something within your management boundaries and things might move out. You would probably color-code this the opposite way.

The take on this thing is that there are some species that have both a low potential for movement and very high, or high, exposures, and then, on the other end, you've got some things that have a high potential for movement, or very high for mahi, and relatively low to moderate overall climate vulnerability, and so the things that are up in the top-left-hand corner are things that the environment is going to change, and they may not move as well, and they may experience some stress. The things on the other side are things that the environment is not going to change as badly for them, given their distributions, and they also have the ability to move around quite a bit, and so they're sort of in a better situation, and, again, you might view that differently if you're thinking more about your management jurisdictions and what might happen.

From here out, I'm just -- I was thinking more about we have some results from the study, and there are pieces of that that I think are useful and pieces that you may want something that's better, and I think there are some tools out now that could probably help with some of the things that you've been talking about.

I'm not sure that the model that you've got in place, or at least the CVA -- Like those particular results are exactly what you want, because it's these big blocks of time, and you may want something that's got say every year sorts of climate status estimates, and then follow that along and look at how that's changing, and then base things in terms of what might be happening in the system, and so some things are being considered on EFH, or habitat, and fisheries CVAs are highly vulnerable species, depending on highly vulnerable habitats for one or more of their life stages, and there's some work up in the Northeast that's happening that's looking at some of this stuff, where they're overlaying a habitat CVA with a fisheries CVA, and they're doing something quite like this, and some of the products are nice that they're coming out with. Michelle Bachman is the person who's been working on that.

The next thing is currently designated essential fish habitat change, and will the area that you've got right now set up for essential fish habitat change markedly if the physical and chemical conditions shift, and I was thinking about some of the biogenic sorts of things, like temperature and salinity and things like that, if that changes some of the structure that you've got that the fish are using in these things.

Is there a need to identify areas outside of your current designation that will offer EFH in the future, and I think what Wilson was talking about with green turtles is something like this right

now, and there are ways that you get at this, and I will talk about that in a second as well. Part of those areas are outside your existing management boundaries, and do you have to negotiate with things above Hatteras, and possibly, and that's something that is -- I think it's underway, those sorts of discussions.

Species distribution changes, and what the time scales involved are, and, again, this is something where what you would want is something that's sort of a year-to-year estimate of how those things are moving along. Better estimates of the species distributions, rather than something that's fixed, which is the case for the standard CVA, and so you want the distribution to be a function of the environmental characteristics, and then have the environmental characteristics change with climate change, and then your species can move, and I'll talk about where this may go in that respect, and then, with some other set of decisions, and those decision points that I talked about, provide additional insight, and, you know, could you characterize things in a more or less risk-averse way by choosing those decision points differently.

By that, what I was talking about were the emissions schedule that we used, and, in this case, it is something like that, and, depending on what you wanted, and, if you wanted something that said, yes, we're going to do a very good job of mitigating emissions, CO2 emissions, greenhouse gas emissions, or we're not, and things are going to get worse, and we're on a trajectory, and it's going to look like this, and you can pick one of those and then put something that's more or less risk-averse, and, as I was mentioning, there are more options now, which is really very nice.

What these are, these things are basically different emissions schedules, and, you know, the top one is the RCP8.5 that we use, and then there's less aggressive sort of looks at this thing, and you will notice that, you know, where things sort of begin to part -- That's kind of the block that we were talking about, and the only one that's really a big departure is the most optimistic view of this, and I talked about the timeframes already. Are you looking at individual years, multiple years, or multiple decades? The total that you use there is probably different for each of those, and there's plans to get at some of that as well.

The baseline I think is really important, and we have used the one that was available to us, and that's what was used in a lot of CMA5 class analyses that were done for lots of different things, and that changed a bit, and so now you have a choice between several, and you need to consider that, because differences in baseline are going to change what your estimates of the magnitude of the overall change, how bad would it be, et cetera.

These are some of the new options. As I said, the CMIP6 is available now, and it's becoming much better understood. It was used in the last IPCC report, which I think was done and put out in 2021. This right now is the standard, and there's some work being done for the next generation that will probably be better, but this one still -- There is active research being done.

The discussion for some of them, the early discussion for some of them, was that they run hot, and so the output that you get is a little bit warmer than maybe it should be, and I don't think that's necessarily true, and it seems to be that maybe it isn't, and, also, the warming that we've got right now, in the last, you know, little bit that we had, where it seemed like it was really extreme, is actually picked up by these models pretty well, and it's like things are happening that aren't necessarily out of the order, and it's within the bounds of sort of the variability that they were expecting, and things like El Nino, when it happens, aren't necessarily factored in there the same

way, but they show up, and so we're probably in the expected trajectories right now, and so I think these are really pretty reliable right now.

The CMIP6 is a group of models, and it's an international collaborative, and different agencies run these models, and they submit them, and they're compared against each other. Some are picked and used in different ways, and it may depend on performance standards. The setup for the models is there's a set of conditions, and conditions that they need to run them under, and so the setup of the model, and they all use the same piece of that. There's that part, and so the model type is the thing that's really varying between the models themselves, and, by building the ensemble, you're kind of averaging away some of those differences between the models. The variabilities you're picking up, some of it, that you see in the reports has to do with model differences, but not entirely, and it can also just be the prediction differences.

The SSPs that I mentioned before, I will discuss them in this table in a second, and then these multiple reference and projection time periods, and there are some in here, but there's a bunch of other ones that are as short as like fifteen years, which are really pretty nice, and the thing that's sort of in my mind about these is, for an application, you've got all these reference periods, and projection periods, and, for the existing CVAs, we used a fixed year as your output, the output you're going to use, and everybody did that same approach, and I'm wondering if there are sort of options that somebody could use.

You've got a climate CVA that's out there, and the tool that would go into those and say I don't like the baseline, or the projection period, and can I change that, and allow that to happen, and then what can be done, in this case, is that you could use the -- Because the sensitivities are scored separately from the environment, you can use the sensitivities that were scored, by Wilson and company, and then change the environment around and do some of the calculations that brings them together and come up with new estimates for things, and so it wouldn't require this big process of assembling a large group of people to do it, and you would just be changing the environmental part, and that could potentially be more or less automated. I haven't looked into how to do it, but it's something that's sort of brewing in my mind, and we'll see where that goes.

There are a bunch of different of these SSPs, and, as I said, they have to do with how societies develop, and SSP1, in general, and these numbers have to do with some assumptions about rate of forcings and CO2 trajectories and things like that, and they're kind of standard, these things that are chosen here. The top here is basically -- It's a green environment, and we do a really good job of moving things toward more sustainability, et cetera, and the next one down -- The SSP2 are sort of a middle ground, and countries are developing -- Projects are sort of moving along, but there is sort of environmental degradation going on, and it's obvious in these SSP2.

SSP3 are -- It's inequality, and cooperating states are developing, and poorer states are having a different sort of problem, and environmental problems are being addressed in the cooperating ones, but not in the poorer, lower-education ones, and the next one down, SSP5, are fossil fuel developed, and so it's sort of what we have now, and everything is kind of moving along the way it is, and we're handling local air pollution problems, but the emissions are growing, and so the environment is going to change.

SSP3, by the way, is there's an SSP3 that shows up, and the term they use for it is rivalry, and it has to do -- I'm bringing this in because you can pick what kind of environment you think about,

and it's nationalism conflicts that push global environmental concerns into the background, and investment goes into security instead of tech and education and things like that, and so there's a loss of the ability to deal with things, and there is drastic environmental change, or damage, done in some areas, and so you pick one of those scenarios, and then you pick the CO2 growth level that you think that things will work out, and I can talk a little bit about CO2 if anyone wants to know.

Things have changed, I guess is what I was trying to get at with all that, and we've got new products available, and there's a lot of different choices that can be made, and you can kind of tailor these things a lot better right now.

Where things might go, and I talked about these CMIP6 climate models, and some of the choices that could be made in there, where we are with sort of the international thing, and, within NOAA, there are things going on -- Within fisheries, there are things going on right now, in play, that could make a difference in all of this, and one of them is this -- I'm sure you've heard of this climate, ecosystems, and fisheries initiative, and what they're doing is they're building regionally-specific climate models that will give you short-term to long-term projections, and so hindcasts as well as sort of forward looks at things, and you use different things for the different questions you have.

There are models already deployed that are sort of -- People are looking at them, and the one on the far-right is the one that covers the Southeast, and it's published, and some of the output is available for it, and people are going to play with it, and you can download it. There's an article about it, with a link, and Ross, I think, is the first author, but it's available, and these others are as well. The resolution of these models is much better than what we see in the climate models, and so it could be pretty good.

Can we pick out something like an individual reef, or something like that, and I'm not so sure that the resolution is that good, and I'm arguing that we should come up with nested models, or downscale models, from these that would address some of those issues, and depending on how things work out, and so that's what is happening there.

Then there's also some work that's being done to start thinking about what would we do now, and there are two pieces of information that are sort of on the table. There are these dynamic ocean models, which are things like there's an EcoCast model on the west coast that looks at fishing and protected resources and gives you -- It uses a lot of satellite information, and it tells you that we've got -- Here are places where you should be fishing, and avoiding protected resources, and here are other places where you shouldn't, because the interactions could be bad, and like things like that could show up, and so that's out there, and what people are thinking about is how can you blend those two and come up with something, and so I think the next-gen is --

The next-gen assessment for this is going to be some combination of these two, and, initially, it will probably be set up using something that looks more like this EcoCast, this dynamic ocean modeling piece, but it's going to move toward something that is using the products from -- Like this thing for us on the far-right-hand side, these more regional pieces, and so it will be using information from this, probably some satellite information as well, and current ideas about what fishing effort and things like that look like, catches, and it will have species distribution models built into it that can follow the habitat that is available for -- The habitat that is preferred by a given species.

So that's where I think -- That's where things are going to go, and there's a workshop, the week after next, to begin talking about these next-gen CVA dynamic ocean models and how do we do it piece.

Also in play, and it's on the same timeframe as the CEFI, the top one, the climate, ecosystems, and fisheries initiative, and it's IRA funded, and so it's a limited time, and the idea is to produce something, and it will get picked up if it's useful. There is something called essential data acquisition working groups, and there are a number of different pieces to it. There is unmanned systems, acoustics, remote sensing, and I'm on the remote sensing piece, and what they're going to try and do is come up with an EcoCast that's deployable all around the country, with two different test sites.

One is in the Pacific Islands, and one is in the Gulf of Mexico, and, because I'm on this, and I will help, I will try to see if we can extend what's happening in the Gulf to the South Atlantic, and I cannot promise that will happen, because I'm not really -- I'm sort of a regional person, and helping this along, and the work is going to be defined by people at Headquarters, in terms of how things play out, but that's the idea, is we'll have pieces of this play within the next couple of years, which should be really nice. Then, you know, expanding it beyond that.

That's it, and the contacts on there, and there is mine, and Lauren Waters is a person that works me, and Roldan, with some climate work, and she's at SERO, and any of us -- You can contact any of us, and we're happy to help. If you've got questions about the CVAs, I'm probably more informed about what these things are, but Roldan has probably better information about the scoring and things like that, the expert scoring that was done for the South Atlantic. Thank you for the interest in this topic. I really do appreciate it, and I enjoyed the discussions, because it gave me a bunch of ideas, and, if there's time, I'm happy to take questions on any of this.

MS. CROWE: Thank you, John. That was a lot of really good information, and I especially think your EFH considerations tie nicely into our conversation that we just had about the tidal/freshwater line. Do we have any questions in the room for John? Wilson.

DR. LANEY: Thanks, Madam Chair, and thank you, John, for that great presentation, and I will just note that Brendan Runde is now on our AP, and Brendan was also a member of that team that developed the climate vulnerability assessment, and is there a way that we can move back to that slide that showed the potential for habitat distribution shifts, because I wanted to make a point about the Atlantic sturgeon in particular.

You will note that Atlantic sturgeon is up there in the very high upper-left cell, and, while it says low to moderate potential to move, and very high climate vulnerability, that could be somewhat confusing, because most of us are aware that Atlantic sturgeon are highly mobile, and they move all over the place, and so why would we say, well, there's just a moderate potential to move, and the reason I think we did that, John, and correct me if I'm misspeaking here, and Brendan too, was that they're very tied to a specific spawning habitat, and so the moderate -- The low to moderate potential to move refers to their spawning habitat and not to their estuarine nursery habitat and their adult ocean habitat, because they go all over the place, and, as a matter of a fact, some of the sturgeon from our South Atlantic area may spend part of the year in the Minas Basin, up in the

Bay of Fundy, up in Canada, and so, again, it goes back to the points we were making when we were talking about American shad earlier.

It's the same kind of deal, and, you know, they're pretty mobile too, when they're out in the ocean, but, again, because these are distinct population segments, and they're DPSs that are genetically different, they're tied to a very specific habitat for spawning, and so you have to consider the whole life history of a given species when you're doing these kind of climate vulnerability assessments.

Thank you, and that's the point that I wanted to make for that particular species, but I think it also probably applies to American shad as well, and probably river herring and hickory shad, and, to a certain extent, to striped bass, but maybe they're a little bit more -- There's maybe some more straying there, and so, obviously, after the last glaciation period ended, and things started to warm up again, striped bass were able to expand from the South Atlantic, where they survived the glaciation, and recolonized those rivers going back north again, and probably, maybe, Atlantic sturgeon did the same thing, I guess, and I don't know that anybody has really looked into that, but it's just something that we have to keep in mind, because these things all have multiple life stages, and the different life stages may have different habitat requirements, and so forth and so on, and so, once again, it's complicated.

DR. QUINLAN: I can't add anything to that, Wilson. That was great, and I completely agree with it.

MS. CROWE: Okay. Anyone else have any comments? Go ahead, Casey.

MS. KNIGHT: Just a follow-up to that, Wilson, and, you know, I totally get that, with the site fidelity for the Atlantic sturgeon, and why you would list them as highly vulnerable to climate change, but low for the potential for changes in distribution, but then I see other species that are in the still high and vulnerable to climate change, but then are -- They have a high potential to move, but they still also show like high site fidelity, like red drum and southern flounder and a couple of other species, like American eel there, that we have good tagging data on, that shows their return to the same locations year after year, and so it's the same thing, but you have them listed as highly mobile.

DR. LANEY: Good point, Casey, and, I mean, it is. It's very similar. Things that return to their natal area for spawning, or any sort of residency, fall into that same category.

MS. KNIGHT: Kevin.

MR. SPANIK: Maybe I missed it, but is there anything in there about like sea turtles and how temperature affects the sex differentiation or anything like that, for overall ratios? That may have an effect on their fecundity as well.

DR. QUINLAN: Sea turtles weren't included. Protected resources aren't -- There is a different group that is preparing those. The marine mammals CVA is out, and I think that the sea turtle -- I think it's underway, if it hasn't been released, and I can double-check on that. Those sorts of factors would play a role in the discussions on this, and they may run the environmental part of this thing differently than we ran the environmental part on our side. Things may be more

subjective there, and so those kind of issues would come up in that process, and I can double-check on that.

MS. CROWE: Wilson, go ahead.

DR. LANEY: Kevin, that's a good question. Brendan, do you remember -- I don't remember that we discussed that with respect to any fish species, because I don't -- Off the top of my head, I don't know of any fish species where gender is temperature determined, or at least I don't think of any off the top of my head.

DR. RUNDE: I don't think it was discussed, Wilson, although I'm sure you're familiar with the summer flounder study, or maybe southern flounder study, at NC State that I believe masculinization of the larvae and juveniles -- The warmer the water, the more males, I want to say, and so that's the only one that comes to mind.

DR. LANEY: Yes, that's right, and I do remember that we did have -- Well, they have done those studies, and I don't know that we had that discussion when we were doing the CVA, but --

DR. RUNDE: The timing of that study I think was concurrent with our in-person meeting way back in September of 2019, which feels like multiple lifetimes ago.

MS. CROWE: Go ahead, Laurent.

DR. CHERUBIN: Hi, John. I wanted to ask you -- You said that ocean acidification was one of the most significant variables, but I don't really see how -- Where, in the vulnerability of the system for the species, that you talk about where its effect is being felt, or how it affects those species, and are you looking at the larval -- The effect of ocean acidification on the larval, and where is that effect acting on the ecosystem?

DR. QUINLAN: So that part of the -- The environmental part of the rankings is -- It runs through the same sort of classification scheme, and there is -- I will explain it in a second, and the biology is on a different side, and the traits -- There is something about sensitivity of the ocean acidification. On the environmental side, there's a measure of pH that comes out of the climate models, and, interestingly, to me, we have -- In I think all of these systems, pH, ocean acidification, shows up as a big factor, one of the driving factors in this entire thing.

In the South Atlantic, sensitivity to ocean acidification ended up being low, low or moderate, on the trait-based part of this thing, and so the biology is saying maybe not, but the environment is saying yes, and I will explain a little bit more about the environmental part before I shift off of this thing.

The way this thing is done is you're looking -- During the reference period, you're getting an estimate of what the variability around the system is, and so you're looking at the standard deviation of the answer across that period, and so, for pH, it's what does the standard deviation look like, and then you're looking at the difference between current and that reference period, in terms of the mean condition, and you're taking that difference and dividing it by the standard deviation, and they call it the standardized anomaly, and I think of it as sort of a signal of noise, in

that you've got variability in the system, and you've got some change in the system, and when is it large enough that you can detect it, and, when you can, how large is it?

That's the measure, and what is happening with pH is that the change in pH is much larger than the variability that is estimated in the models, and pH is relatively -- It varies over a relatively small zone compared to the others, but I think that's what is driving the pH signal, and it's not that it's not important, and I think it's the variability piece of it that is showing up in everybody's piece, everybody's assessments.

The reason for doing the standardized anomaly though is so that you can compare across these different variables, and so we have a big signal in temperature, and we have a big signal in salinity, and we have a big signal in pH, and then some other stuff, and those end up being things where the changes are relatively big compared to the variability, or the -- They're larger, much larger, than the standard deviation, and the changes across these areas is very similar, and they're just one-sigma, three-sigma, three-sigma sort of changes, to figure out where you are in a probability distribution, and some of these are large, and they're three, four, five sigma out, in terms of the changes, and the delta in the mean is three, four, five standard deviations out from the historical mean. I hope that was helpful.

DR. CHERUBIN: Yes, it was. Thanks.

MS. CROWE: Thank you, John. That was a lot of information. Okay. We are running a little tight on time, and so we're going to move on to the next presentation, which is SECAS and the conservation blueprint, and that is Rua, who is also online.

DR. MORDECAI: Hi, everybody. I will do an abbreviated version of this talk, since I know it's already, you know, pretty darned close to when things are supposed to end, but you'll have the rest of my slides, if you want to look beyond that, and so, yes, we can talk a little bit about the Southeast Conservation Adaptation Strategy and the conservation blueprint and what's new for 2023.

Just a little background here, and this is the geography that the partnership covers, and so all of the federal waters of the Atlantic and the Gulf, and fifteen U.S. states and the U.S. Caribbean as well. We've got a number of different organizations, involving, you know, from state to federal to non-profit organizations, and it really came together to connect and work across the entire Southeast, and one of the cool initiatives is crossing not just the land, but all the way out into the open ocean.

There is a few big things. It sets a bold vision, and an ambitious goal, and we're going to skip a lot of that for this particular talk, and it's later in the slides, and it designs a blueprint for action, and so I'm going to talk a little bit more about that, and it also clears barriers to cross-state collaboration.

This is the latest version of the Southeast Conservation Blueprint, and so this is depicting the priorities for a connected network of lands and waters across the entire SECAS area now, and so, collectively, all those priorities cover 50 percent of the area, and it's based on a series of ecosystem indicators, and also a connectivity analysis, and so that highest-priority area, that darkest purple, covers the top 10 percent of the area itself.

Just a few things to think about. It identifies potential areas for a large range of different actions, economic incentives and protection. It's a work in progress, and so we're always bringing in new data and partner input and information about conditions. We've been updating this every year, and, basically, connecting to what John was talking about, especially related to climate resilience, and there's a lot of different indicators, and you can see, as you're playing around with some of the data, if you want to look at some of the underlying information.

Most of the indicators are built around some type of climate resilience component, either resilient features that are going to be important to climate changes or also accounting for things like saltmarsh migration and connectivity and other components, but one weak point we have relates to the ocean, and how resilient are indicators into the ocean, and so we've been looking really closely at the new generation of climate models, GFDL models and pieces like that, and, John, I will probably follow-up with you a little bit more and check in how things are going, but we've been looking really closely at that as a potential for building in some new climate buffers into the ocean part of the blueprint. This is really designed to be a regional perspective and to be used in combination with local data and knowledge and information.

A little bit of history, and some of you all were involved from the very beginning in some of this stuff, back around the South Atlantic Conservation Blueprint, and so what we've been doing, for a while, is trying to piece together different parts of the -- Different plans to create this larger southeast blueprint, and so, back in 2020, and 2021, we had this patchwork of different plans that we were integrating, and those little crosshatches are overlap zones, trying to get them to be as apples-to-apples as possible, but there was a lot of folks that wanted to use the blueprint and have increasingly been wanting to use the blueprint over larger and larger areas, across big multistate areas, and we have multiple federal agencies that use it at that scale, and we have counties, and we have state stuff, and so folks wanted more integrated pieces. In fact, even this fishery management council was split back between two different plans, back a couple of years ago.

We've been working on consistent methods and approaches across the larger geography, and so, in 2022, we did our first big bite, which is all the land and part of the South Atlantic Ocean, and we're still including some information from the Florida marine blueprint, and we haven't really tackled a lot of the stuff around the Caribbean. We didn't even have anything for the Virgin Islands, or out in the ocean, and now, this year, just released last month, the latest version of the blueprint, and it now covers the full area, all the ocean in the Gulf, Atlantic, nearshore marine, and the Caribbean around Puerto Rico, and the Virgin Islands as well.

Here is basically the process. We start with a series of natural and cultural resource indicators. Just on land, we remove some highly-altered areas, and then we use the indicators to rank areas within sub-regions. In this case, the farther open ocean is one big subregion across the Atlantic and the Gulf, and then we bring in some extra connectivity, by identifying corridors and linking hubs, and so that's something we do on land and something we do in the ocean, using least-cost path analysis, and then we put it all together to get the final blueprint.

This year, we got a whole bunch of new and improved indicators, because the focus has been finishing the expansion of the ocean areas and the Caribbean, and so we've got eighteen new Caribbean indicators that cover the land, the freshwater, and the ocean, and we also have nine new or improved spatial indicators in the continental marine area, and so there's links, later in the thing,

if you want to look at all of them, but a few -- Actually, if we go to the next slide, a few things that might be most interesting to folks in the South Atlantic.

We have a new marine highly-migratory fish indicator that pulls together monthly density predictions from bluefin tuna, skipjack tuna, and blue shark at multiple life stages, and so this is some data that we got working with folks from the European Commission Joint Research Center, which is really interesting. It's global, but they actually parametrized and did a lot of work making sure this worked along the U.S. Atlantic, the Gulf, and off of Europe as well, and so there was one indicator there, and we made a bunch of improvements to our coral and hardbottom indicator, including bringing in those new cold-water coral mound predictions in the Blake Plateau that Derek Sowers has worked on, and so we worked with him on getting that in. We got updated models from Matt Poti on the Atlantic deep-sea coral richness, and then some updated information on the marine birds and the marine mammal things we use in the Atlantic.

We had some workshops, and we got a lot of really great comments, both on the ocean side and, in the Caribbean, and this is just an example from the Caribbean that I happen to have, but we've managed to fix about 40 percent of the issues that came up in the workshops in the final blueprint, and we documented anything that wasn't fixed, so we can work on it into the future, and so it was I think 43 percent in the ocean side of things.

There is also another cool feature, where the blueprint explores something that we're -- It's almost updated, and I have it on the test server, and I would show it to you, but I can't share my screen, but one cool thing that we released earlier this year is the ability to filter the blueprint itself based on the indicators, and so this is -- This is the older version of the blueprint, and this is last year's, and it should be up in another couple of weeks for this new one, but now you can take any of the different indicators, and even some threat layers, but, for example, if we took -- Okay, and here is the blueprint, and you maybe wanted to look at places where you could do riparian restoration, and it would benefit aquatic species of greatest conservation need.

Then you can quickly filter this down dynamically and look at all the different parts of the different indicators and say, okay, well, here are some places where the natural land cover in the flood plain looks about right for riparian restoration, and there's at least one aquatic species of greatest conservation need, and so you will be able to do -- In a few weeks, you'll be able to do the same thing with all the Atlantic indicators, you know, looking at places where you've got some of those cold-water coral mounds aligning with tuna habitat, and all that other fun stuff, and so it's pretty slick, pretty dynamic, and, as I said, we're always working on improving things. There's a lot of other cool stuff that you can do in the viewer, but I know we're short on time, and so I'm not going to talk too much about that.

Actually, we'll go ahead and skip the rest of this stuff, and I know we're super short, and we're already five minutes over time, but, basically, if you all want to learn a little bit more about the goal tracking within the larger partnership, where we have this larger goal of a 10 percent or greater improvement in the health, function, and connectivity of southeastern ecosystems, and we track kind of recent changes, this 1 percent improvement every four years, and so there's a bunch of slides, or there's a number of slides after that, that show a bunch of cool things that we've improved related to goal tracking and metrics, but, since we are over, we'll skip all of that, and let's just jump ahead to questions.

MS. CROWE: Thank you, and I'm sorry that you felt pressured for time, because that's a lot of good stuff, and we do have one question online, and so, John, if you want to go ahead.

MS. HOWINGTON: John actually typed in, and he apologizes for running long, but, John, you don't need to apologize for that, and I'm pretty certain that was a group effort, and then he wanted to add two things that were prompted by Rua's talk. The CVA for HMS is underway. The write-up is happening right now, and new research by a program called Deep End finds trophic connectivity between shelf and open water, and so, if anyone is interested, John is online, and so, if we want to follow-up with that, we can.

DR. MORDECAI: John, I'm definitely going to follow-up with you on a few things. I've been working on -- We're talking with some of the folks that do -- In NOAA that do some of that essential fish habitat modeling, and having them take a look at some stuff, but I would love to chat with you, because I think there's some really cool stuff that we could do in the future, with the blueprint, on better capturing those within marine and then marine to freshwater connections, and, yes, there's a lot of cool stuff that I've wanted to do for a while, that we want to try and build in related to climate resilience in the ocean, and I think the models are -- We're finally starting to get there, where we can resolve the mesoscale eddies and start getting at that level of resolution that we can start using in this kind of spatial planning.

MS. CROWE: Do we have any questions, or comments, in the room? Nothing? Everybody is tired.

MR. PUGLIESE: I really appreciate it, Rua, and I think it was really important, at this time, to kind of bring you into the queue on this. The council was actually really heavily involved in the Landscape Conservation, which was the foundation that evolved to the Southeast Connectivity and Adaptation, and the tools, the capabilities, the information, the extension into the true full ocean, and that was really important, and that was the foundation to get us to where you are now, and I think a lot of what has evolved has gotten to the point where so much of that information really does affect a lot of our essential fish habitat, and it's -- The detailed level of information I know on water flow, on species use, and all that type of thing I think it going to be really important to make this connection back with SECAS and reconnect into how this is evolving, especially with all of our climate activities that the council is going to be involved in in the future for climate scenario planning and different things like that, and I just think it's natural to get back there.

Also, this is one of the only places -- When we first start talking about this, about connectivity and building corridors and understanding that full connection, from the land-based areas all the way out to the shelf, and this is the only place I know that they've gone that far, and so it's nice to see this go even further, and collapsing everything too, which is really great to see, that it will finally fill in a lot of the details on this, and so just some comments, and I think, you know, getting Rua involved further into this process is going to be really important, and so hopefully you're going to be willing to step -- One big pitch I'm going to do here is that we're moving forward with looking at a regional Fish and Wildlife representative for the advisory panel, and so, given what this can bring forward for all these different discussions that we're having on water, on climate change, on the regional perspective, and think about that, and that's going to be a really important next step that we have for engagement of Fish and Wildlife and with these types of things.

DR. MORDECAI: I will be here for the rest of the meeting too, listening and trying to find ways that we can build off and connect this work, and we are starting -- In other places, we're starting to -- We'll be working with the Open Ocean Trustee Implementation Group in the Gulf, around using some of this information, and we are seeing, in some spots, and like even in the Caribbean, all those pieces coming together, where we were just actually having folks talking about a slightly different conservation corridor route in Puerto Rico that they are thinking about, to better capture actually some fish nursery habitat, and on land connected to fish nursery habitat, and out into the ocean, and so I think there's a lot of cool things that we can do with even better handshakes between the ocean and the land, and so I'm excited to keep helping with that.

MS. CROWE: All right. Great. Thanks again, Rua, and thank you to all of our presenters today. Unless anyone has any comments, I think that is it for today. We'll be back at 8:30 tomorrow morning. Paula, go ahead.

MS. KEENER: Thank you, Stacie. I think everyone knows that we're having a working group meeting following this meeting, as short as possible, and certainly not over an hour, and so, whether or not you're a member of the working group, you're welcome to join, and this is for updating the energy policy related to wind for the council, and so I think this room is being reserved, correct? Okay. Great. Thank you.

MS. HOWINGTON: Are you going to need access to any of the speakers or the projector or anything like that?

MS. KEENER: No. Thank you, Kathleen.

MS. CROWE: Okay, and so that's it, unless you're staying for the working group meeting, and we will see you in the morning. Thank you.

(Whereupon, the meeting recessed on November 1, 2023.)

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NOVEMBER 2, 2023

THURSDAY MORNING SESSION

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The Habitat Protection and Ecosystem-Based Management Advisory Panel of the South Atlantic Fishery Management Council reconvened at the Marriott, Charleston, South Carolina, on November 2, 2023, and was called to order by Chairman Stacie Crowe.

MS. CROWE: Good morning, everyone. Welcome to day two. Sorry we're getting a little bit of a late start. Today, most of our talks are going to be focused on energy, but we are actually going to circle back, for a minute, to Rua's talk from yesterday. He got cut short, and he had a lot of really good information, and so he's been kind enough to come back online this morning and kind of pick up where he left off, and so, Rua, whenever you're ready, we're ready.

DR. MORDECAI: So I gave the early first half of this talk, talking about the Southeast Conservation Adaptation Strategy and the Southeast Conservation Blueprint, and we have a good, long history of working with member folks on the council, and collaborating with Roger, and, in fact, a big reason why we're even working so much into the open ocean is because of some early participation he had in the partnership, which is exciting. We're always looking to integrate with the great work that the council is doing and provide some helpful connections between the -- Basically, all the way up from the mountains out into the open ocean.

We'll go back to where we stopped last time, which is here, and so I talked -- The first section was talking a lot about the conservation blueprint, and I think there's a lot of great opportunities for integrating the spatial planning stuff, and we always look to the council to help review, but also help to integrate the work you all are doing, and so we're very interested in progress on habitat blueprint and the other work that's going on.

Another thing that we work on is tracking progress towards the SECAS goal, and so the goal of the partnership is this 10 percent or greater improvement in health, function, and connectivity of southeastern ecosystems by 2060, and that's pretty far away, and so we also track a few different metrics, based on things like ecosystem assessments, and so things like a 1 percent improvement every four years, and are we on track for those goals, and how are we doing, and we use this in a bunch of ways, particularly to focus efforts on kind of resources and ecosystems that are most off track for the goal, and so we've used it multiple times, not just as a partnership to focus effort, but also in kind of making a case to national funding sources, and other groups, when they ask the partnership on kind of priority projects and resources and things like that.

That is the goal, and, basically, we shoot for, every year, to have an updated assessment of how we're doing on the goal, and this is data from the 2023 report, and this is like the highest-level piece, and so, basically, this is looking at number of indicators around health, function, and connectivity, and so, basically, if they're in the green, we're on track for the 1 percent improvement every four years. If we're in the yellow, things are getting better, but not fast enough, and then everything in the red is basically going in the wrong direction, and so this is looking at starting from when SECAS was established in 2011, and most of these -- You know, whatever the best available data, as much as we can get, and a lot of this ends around 2021, for most of them, and some go to 2022, and so this is the assessment.

We really build on the existing work and tracking that's already happening, and so we've been working, you know, closely with NOAA, and the folks doing the indicators and dashboards and tracking, to make sure we align with that, and EPA on the coastal condition index, and a number of other things, and so some stuff we model ourselves, through remote sensing stuff, and aggregate, and then, whenever possible, we use existing tracking and put it all together.

If you go to the next one, improvements we made for this year, we have a few new indicators that we've added, things like natural land cover in the floodplains, landscape condition, and Caribbean undeveloped land. Those are a few of the newer ones, and we're also -- Whenever we have more detailed trends data, we try to represent them at finer scales than just state sort of coarse levels, and so this is an example of landscape condition, and this is one that's really not doing great pretty much everywhere, and it's summarized by county, and so it's pretty much declining across most of the Southeast.

Then we also have updated data and methods for existing indicators, and one that would be particularly interesting to this group is the aquatic connectivity one. We work really closely with the Southeast Aquatic Resources Partnership and their work in the aquatic connectivity teams, tracking improvements and connectivity over time, and so this chart is looking at cumulative miles of reconnected rivers and streams across the Southeast, including the Caribbean, and so that does include some of the improvements in Puerto Rico, and across the larger area, and so we work closely with them, to make sure we're syncing stuff, and this is includes both -- Not just dams, but also culverts and other components, and so that's fun stuff.

We also have a new quantitative approach for estimating uncertainty. With a lot of the indicators, we didn't have the data, or the approach, to really get at uncertainty in the trends in past assessments, but now we've got a little bit more data, and an approach, and so not all indicators, but a lot of them we now have uncertainty estimates for all the trends, and so the kind of low and medium confidence and things like that, and so we still try to integrate other components, but, in this case, when we have enough data, like forested wetland area, we do take that regression, and the uncertainty in the regression, to look at how confident we are in the different trends at different scales, how confident we are across the Southeast, how confident are we within a state, and, in this case, how confident are we in the trends within councils.

We're working on a prototype dashboard, and it's planned for next year to release that, and so to kind of make this thing more interactive, and so, if you wanted to dive into some of the changes in natural land cover in the flood plain by specific places, you can find all the different data and information about not just percent, but, you know, how many acres, and what's the trend in acres of change by -- In this case, these are HUC 8 watersheds, and so we're working on making it a little bit more interactive. Right now, it's pretty much like the PDF information that we have so far, but we're shooting, for next year, to have a nice little dashboard, so you can explore the trends and dive a little bit deeper in what's going on with the different indicators.

Another really cool thing we have right now, as we're getting more of these metrics, and finer resolution, is blueprint user support, and so staff that helps folks use the blueprint, for free, and I know there's some folks, even on the AP, that have used the blueprint in the past, and so we can now help with trends in particular focus areas for some of the indicators, and so things like natural landcover in the flood plain. If you have a particular focus area, or place you want to work, you can send us a shapefile, and we can run the trend estimates, the uncertainty and all that stuff, around some of these different indicators, and so we're working on expanding that to more and more indicators, but, right now, if you have your own area that you want to summarize that by, we can do that, and so that's particularly fun.

The next one is the major results for this year, and there's a lot of similarities with past years, and most of the indicators have improved. Our grassland -- Basically, our grassland indicators are the ones that are the most offtrack still, but there are a few things particularly of interest to this group, like saltmarsh area, that are going in the wrong direction, and a few other components, but that's the results, and it's fairly similar, at a big, high level, but we're starting to get better and better information within each of the indicators.

You can go to the SECAS website, seacasesoutheast, at the goal page, and that has more information about the goal, how we came up with all the numbers, the goal itself, and, also, the goal report is up there, and then, if you go to the next slide, you can also access the conservation

blueprint data information, at the blueprint page, and our Blueprint Explorer is almost up-to-date, and so you can go into the SECAS atlas, and that has all the updated data, and so, if you want all the code, the full documentation, all that stuff, and even some other kind of ArcGIS-style interactive maps, that's up, and you can just download it straight.

Basically, we want to make sure that, you know, if you want to go as deep as you want to go, into all the indicators and all the data, we have all the data sources, all the mapping steps, and, like I said, pretty much all the code for all the different indicators, and so, if you want to grab it and do something different with it, understand how it works, that's all there, and then, also, if you don't want to do that work yourself, and I don't know if I have this slide in here, but, basically, feel free to contact our user support folks, and so there's a link there, and so that's their job, to help people with the conservation blueprint, and we love doing it. It's super fun, and we do it for free, but it's a core part of how we figure out what we want to fix, how we test different things, the interfaces, and all the data, and so we love helping folks out and learning how you all are using it and how we can improve it.

I just wanted to hit a quick little bit, really briefly, about how the blueprint itself is being used, the conservation blueprint, and so now we're up to a whole lot of people, from a lot of different organizations, using the blueprint, primarily to bring in new conservation funding or to inform their conservation decisions.

Just here's a few examples of some different ways the blueprint has been used, just to help out with grant applications to protect and restore land, and this is a fairly easy and quick one too, and so, if any of you all are doing proposals for conservation efforts, we're always here to help you out with the proposals and adding in language, if there's any kind of missing context in how your work fits into the larger picture, and we're glad to do that, and we have some cool tools, and I don't think that I mentioned it as much yesterday, where you can upload a shapefile and get full reports, and data, on, you know, urban growth and sea level rise, but, also, all the different indicators and maps and numbers and cool stuff, but, yes, we love helping with that.

We've helped some folks establish new partnerships, support the reauthorization of some conservation funding sources that were at threat, and we've helped out with some city and county planning work, a whole lot of different types of things, at all different scales, from working a lot with land trusts to state level to multiple federal agencies use the blueprint in prioritizing how they use their -- How they allocate resources across the Southeast, and so lots of different, fun examples, but I just wanted to give you a flavor of some of them.

Here's a chart just showing, you know, basically the different number of unique organizations using the blueprint, and how that breaks down across different sectors, and so lots of different groups, and I think, particularly for the council, and this idea of, you know, connecting that sort of -- Basically, the mountains to the sea piece, and it's a really nice opportunity to try to figure out how we can better inform, you know, folks that are working in areas near the coast, or even farther away from the coast, about how their work can contribute to even things out into the ocean and a lot of the species and habitat that the council is working on, and so we've got a lot of folks, and we try to bring that holistic look at benefits and impacts and where things can most benefit the large suite of different natural resources and cultural resources that we care about from the area.

That's it. If you want to get involved, we have a monthly newsletter that comes out every month that keeps you in the loop, if there's some stuff you want to -- As new things come out, or you want to get involved in things, it's there, and you can contact me, or you can contact Hilary, and Hilary is our communication and user support lead, and so she's a good go-to person, regardless of what you want, and that's it. That's the other part of my talk.

MS. CROWE: Thank you. Wilson, go ahead.

DR. LANEY: Thank you, Madam Chairman. Hi, Rua. Good morning. Thanks for the great presentation. I have a question, and can we go back to the landscape condition trends slide? That one is -- It's disconcerting to see all of that red on that slide, and could you speak, for just a moment, about what are the actual metrics that go into that, that flip things from, you know, red to green?

DR. MORDECAI: Yes, and so this is one -- The landscape condition indicator is looking at naturalness at multiple scales, and so the different scales at which species experience the ecosystem., and so it's looking at, basically, you know, the whole thirty-meter pixel, but then ten acres, a hundred acres, and a thousand acres, and so it's looking at, okay, how natural is the landscape at all these different scales, and it averages them together, and so pretty much that means -- So that's what that is capturing, that naturalness, and, yes, it's -- You know, we're not getting better, in a lot of places, especially -- You know, one thing that jumps out, to me, is pretty much the entire coast, the Atlantic coast, and that landscape condition is getting -- It has been getting worse and worse and worse over time, but that was a pretty consistent pattern in most places that you looked, that it was getting worse, which I guess, you know, folks that have lived here for many, many decades, and think about the naturalness of the area you live in, I guess it isn't too much of a surprise, but that's what that one is capturing, that sort of multiple scales.

That is -- That's also one that we have -- We also help folks out with looking at the impact of how their actions impact a larger landscape, and we actually -- There is a version of this down in the Caribbean, and they were making a case for a significant investment in protection and restoration down in St. Croix, and we helped them take a look at how the protection and restoration of that site would impact not just the site itself, but also the surrounding landscape, and how it improves the landscape condition not just within the parcel, but outside the parcel, and so these are the kind of things that we can run dynamically, and so, if folks are looking at restoration -- We can do this with a few of the indicators, through user support. If you're looking at here's what we're trying to get the landscape too, we can rerun the metric and look at how those change over time with actions, and I know that wasn't part of your question, but it's just --

DR. LANEY: A follow-up, Madam Chair? I don't want to unnecessarily delay the meeting here, and I will bop over, and you and I can discuss it more at-length sometime, but I will ask one more question, because I think the AP members might be interested, and so I -- Do I presume correctly that we could zoom down to a single watershed and look at landscape condition trends on a watershed basis here, if we wanted to do that?

DR. MORDECAI: Yes, and right now -- Once we -- Well, right now, and once we have the dashboard up, then yes. This is summarized by county, but we can summarize it by landscape, or by watershed, too, if you wanted to look in -- If you have any particular watersheds. You know, if the council wanted to look at some of the changes within all the coastal watersheds, of whatever

size you want, you know, we can run that for different areas, and then you could go and look at the trends.

For the dashboard, for every one of those, right now it's summarized by county, but you can click on all of those and see the landscape condition over time, going back I think to 2011 to 2021, and so multiple timesteps, and see how it has changed over time.

The other note that is interesting in this trend is the places where things are not in the red do align with some places where there has been a lot of conservation investment, and so the red zones in areas around Georgia and Alabama, where there's been tons of stuff around longleaf, and that pops out, and a lot of places in the lower Mississippi Valley, where they've been doing a lot of reforestation, starts popping up, and so there a few of these trends that we're trying to be able to capture some of these bigger signals of where people have focused, and I think it will be more -- Even more prevalent if we start looking at areas where there is greater conservation focus, and see how that compares to the larger landscape, and so, yes, we can do it to whatever scale you want.

DR. LANEY: That's great, and, again, like I said, I will come over and talk to you more about it later. I would be especially interested in the Roanoke watershed, for sure.

DR. MORDECAI: Yes, and I know we do landscape condition, forested wetland area, and natural landcover to floodplain, and so, yes, and just let me know.

MS. CROWE: Anyone else have any questions or comments? Go ahead.

MR. PUGLIESE: Thanks, Rua. I really appreciate everything, and, you know, I think it's really a critical time to have this discussion and really highlight what is going on with the efforts, because I think this is the only place where we could look at, through the entire region, some of the changes that are affecting, you know, the habitats in combination, the waterflows, and I think the other thing that you've emphasized is that ability to go in and look at this information down to a really fine scale.

The tools in this are just pretty phenomenal. I remember how it started, and it's evolving even, you know, beyond where I anticipated. That slide that you showed of all the participation is massive, because I remember the origins, and the involvement of these bigger organizations was big, and so I think there are so many connections with our understanding of essential fish habitat across the region and some of the original things that we discussed, like waterflow regimes for the different rivers in the entire system, which was a directive under our earlier discussions by the AP and in the habitat plan and through the fishery ecosystem plan, and so there are tools, capabilities, and information I think that can really -- As this continues to go forward, and engage the advisory panel and the council, to really align a lot with our essential habitat and our information in the offshore areas.

The original Ecopath with Ecosim model that was developed was funded through our original roots with SECAS, which was the Landscape Conservation Cooperative, and so that opportunity to make some connections and enhance the oceanographic side of that I think still is there and the finetuning of some of the indicators, to maybe include other habitats, such as SAV, or different other things, and I think there's some just real synergies that are coming together now, and the states are really investing heavily into this, and so making those bridges and looking at -- Imagine if we would be

able to look at those different areas and begin to understand, in combination, those inshore habitats, the waterflows that are supporting those estuarine-dependent species, and building that connection and looking at the corridors that are supporting and enhancing and, you know, building those populations I think is huge.

I think this tool and capability and partnership is really an avenue to get closer to that than anything has ever done, and so I just wanted to make sure you're in the queue early, that the AP members had an opportunity to see how far this has evolved. You know, I know a number of the states, or whatever, are already heavily involved, and so here's an opportunity to go further with the ocean side, and building on where we first got it, to get a foot in the door, to make sure that ocean stayed in this, and here is an opportunity to go further, and I figured that was one of the most important things that I could do before I head out, is to make sure that you all are involved and that you have an opportunity to see where this can go.

DR. MORDECAI: Well, thanks, Roger. You've definitely been a huge -- You've made a huge impact in the ability to look at bigger connected ecosystems, instead of some of the classic silos, where all the agencies, and organizations, end up having to work.

MS. CROWE: Okay. Thanks, Roger, and thanks again, Rua, for being willing to come back on this morning and finish up. Now let's go ahead and move into today's agenda, and we're going to start to focus on some of our energy discussions. We're going to start off with Brian Hooker, who is going to give us an update on offshore wind activities in the South Atlantic region.

MR. HOOKER: Good morning, everyone. Thanks for the opportunity to be here again at the November AP meeting and giving the opportunity to give everyone an update on where we are with activities in the South Atlantic.

I think the topics that I mainly wanted to highlight in this presentation are the CVOW project, and where we are with some of the central Atlantic wind energy areas, and then go into some environmental studies updates. I will give an update on Carolina Long Bay, and Kitty Hawk as well, and I didn't include them here, because I think my own mental notes -- They are presenting to the Mackerel AP next week, here in Charleston, and so if you want to come back and actually get a full briefing from those leaseholders, the Mackerel AP will be having them next week, and their slides are now posted under the Mackerel AP briefing book, if you want to see the actual slides from the Carolina Long Bay and Kitty Hawk developers.

First, you know, if you're following the news at all, the Coastal Virginia Offshore Wind project -- I knew, when I sent this to Roger, that it would probably be outdated by the time I sent it, but we did approve the project, from the perspective of the NEPA process, and we issued the record of decision to approve the construction of the project -- Was it yesterday, or the day before yesterday, and I think it's correct that it was published on the 30th and posted on the 31st on our website, and so you can see that record of decision on our website, under the CVOW project.

The next step is actually the federal permit approvals, and so there is permit approvals from the Army Corps of Engineers, the National Marine Fisheries Office of Protected Resources, who issued the letter of authorization under the Marine Mammal Protection Act, and then there is BOEM's actual construction and operations approval document too, and so those are still -- After

the record of decision is issued, those permit approvals still need to be issued, but that one is moving along.

There is also -- I think there was also a big event in the port of Portsmouth, where they had the first foundations offloaded, and so you can actually just drive up to Portsmouth, if you want, and take a look at the turbine foundations, and things are moving with the CVOW project, and so big news there.

Moving on a different phase of construction, or planning, and this is the planning and analysis phase, and so well before where we are with the CVOW project, and so, if you recall, BOEM went through a process of trying to identify additional lease areas in the mostly Mid-Atlantic area, and you can see where those proposed areas were originally, and we issued a final wind energy areas back in July. The next phase is a proposed sale notice, and we are, you know, working through that proposed sale notice process right now to identify exactly, you know, if we're going to propose all of those areas, some of those areas, or some differentiation of those areas that were in that final wind energy area delineation.

In that proposed sale notice, there will be an opportunity for comment, and I know some of the things that a lot of folks are interested in is different bidding credits that might be part of the proposed sale notice are included in that, and, you know, we just comment on any issues, or any concerns, regarding the lease sale, and those opportunities are presented in that proposed sale notice, and there will be usually a meeting around that as well, and so that's where we are with the central Atlantic.

Now I will, you know, give just -- I will kind of wing it a little bit and give you an update on where we are with the Kitty Hawk project, and so the Kitty Hawk project, if you recall, did have a Kitty Hawk North, and they divided the lease area into two projects, Kitty Hawk North and South. We issued a notice of intent to prepare the EIS, and we're still in the process of developing the draft EIS, and I think, you know, they're looking at construction no earlier than I think 2026, and so we still have to issue the draft EIS and begin that public comment process on the Kitty Hawk North project.

I think the best place to, you know, look for updates on when those are happening is BOEM's website, and make sure to sign-up, if you are interested in participating in that DEIS process, when it hits, and then we also have the permitting dashboard, and that is at www.permits.performance.gov, and you select "BOEM", and you will see all the different projects, and where they are, with all the different authorizations in the EIS process. We try to keep that as up-to-date as possible, but, you know, things do shift. As a matter of a fact, for the Kitty Hawk North project, you know, things have shifted a little bit as well, and Kitty Hawk North, on this slide, is that kind of gray-dot area in the D block below, and that's the area we're talking about with Kitty Hawk.

The other two projects, which I don't have a slide for, are the Carolina Long Bay projects, and those are kind of -- They used to be called the Wilmington East lease area, but they're now Carolina Long Bay, and they're in the process, still very early, of finishing up -- This past fall, and I think it was in August, they did some geophysical surveys out there, to try to identify locations to deploy a meteorological buoy, and they are doing it jointly. Duke Energy and Total are jointly doing a site assessment plan, and so we do anticipate that, likely this summer, spring or summer, they will

be deploying a meteorological buoy in that lease area, to look at windspeed data and so forth, and so that one is moving along slowly.

Along those lines, you know, I do want to note that -- You know, I think there was also some news, recently, where a major developer, Orsted, you know, cancelled some projects off of New Jersey, and so I just want to emphasize that, you know, as we're going through all this, it's clear that really nothing is certain in this world, with the rising costs and challenges with -- Not only with permitting, but, you know, logistics and supply chain and so forth. They all plan a hand in this, and so I just want to make sure -- Put that perspective out there, that, you know, even as BOEM, and other federal agencies, and state agencies, are working through these different permitting processes, there are definitely a lot of different variables at play, as to what makes these projects feasible in the end.

MR. JONES: Brian, would you repeat the permitting dashboard, please?

MR. HOOKER: Yes, absolutely. It's www.permits.performance.gov. I can send it to the AP as well, but you can probably just Google "permits.performance.gov", and it will bring you right there, and then, once there, you select "Projects", from the top menu, and then "BOEM", and then you'll get all the projects that BOEM currently has in the authorization queue, and you can see where all the permit statuses are.

MS. HOWINGTON: Do you want me to email that to you, Thomas? The webpage, do you want me to email it to you?

MR. JONES: No, and I can --

MR. HOOKER: All right, and so that was really the snapshot that I had on where we are with with -- Where we are with the various projects, and I did want to move now into the environmental studies program and just highlight some studies of note, stuff that we have done and stuff that other organizations have completed, and, of course, I'm happy to take any questions on any or all of this at the conclusion, but, just as a reminder, BOEM does publish an annual environmental studies plan, and so, from that plan, we say here is all the things that we would like to do, and that plan is on our website, and then, from that plan, we select, based on -- Subject to availability of funds and budget, what we're actually going to plan on funding in that next fiscal year, and so this is done on an annual basis.

Study ideas are usually around this time every year, around the November and December time, and you should keep an eye out for a study solicitation that is issued by our Studies Development Program, and it's an idea to -- It's just a way to submit study ideas, and like what should BOEM really invest in in the next, you know, future years for science needs, and so those study ideas are then reviewed by a National Academies committee that we have standing, and then, ultimately, you know, once these are selected and executed, all the studies are used in BOEM environmental assessments, and the decision-making process, and so, again, we try to have this loop of like we have our EIS process, and we --

If you've ever read of any EISs, there's always usually a section about, you know, available data and what other information might be out there to fill an information gap, and so we try to use our environmental studies program to help fill those information gaps that may exist and try to have

that whole loop of, you know, do an assessment, see where the things might -- Where the gaps might be and then fund them and then enter them into the next assessment. That link down there below is -- I think it brings you to a page where you can sign up to make sure you receive the notice of when those requests for study plan submittal, or study idea submittal.

I did want to update a project that we have going on at the Tower Reef off the CVOW project, and so one of the things, again, that we identified very early on, actually with the Block Island windfarm project, is that we saw different levels of habitat utilization to different materials that were deployed, and so the Block Island windfarm didn't have, you know, rock scour project like the CVOW project, the CVOW research project, the two turbines, but it did have a lot of use, a lot of need, for cable mattresses.

These are articulated concrete mattresses that are placed over the cable where they're not able to reach their target burial depth, and we saw different -- It did not look like that material was being colonized, or encrusted, by marine fauna, and so we kind of went on this project to try to identify can we locally source materials that can meet some of these needs that, you know, can become, you know, encrusted with marine fauna and stuff and basically be more habitat friendly.

What we have now is a project that's actually trying to really evaluate that, and so, just this summer, deployed several different materials that are available for use in the U.S. in the Tower Reef site, and we have a team down there that's looking at all the materials, and I think, actually, I have some slides, and so here's an example of some of the different materials from the deck, and they were using a Virginia Institute of Marine Science vessel for the deployment, and so on the left is one type of material, and then you have these blocks. The blocks on the right I think are more of an idea, and you see they have holes in them, for animals to be able to use those holes, and I think the idea there is that that could be used for more of a scour protection type of material that could be used around the base of a turbine.

Here, what you can see is an example of an articulated mattress, and so that's underneath the -- That's the bottom piece, and you will see those kind of tetrahedral -- I am going back to my geometry days, but those blocks, and they're supposed to be tapered at the end, so they can be trawl friendly, and there is actually, I think, even a bigger taper around the final ones, around the edge of the mats, but, again, this is, you know, a lot more commonly used for cable protection, and I think we're just, again, trying to look at how is -- Really documenting well how this might be, you know, an impact to habitat and utilized by habitat. What we have seen is animals definitely utilize the nooks and crevices of the material, but it just hasn't been encrusted by epifauna, and that's an exciting project that we have going on that just got deployed this summer off of Virginia.

Also, we have the ROTEO project, and so this the Real-Time Opportunity for Environmental Observations, and we just fairly recent published the field observations, during installation and operations at the CVOW research project, and these are the two turbines off of Virginia, and they evaluated everything from turbidity to biofouling, including mussel growth, fish species observations, fishing gear observations, and they did -- I think, in that bottom-right one, you can see some fishing line around the base, but there is other images in the final report, and even in our ROTEO website, showing what they're finding after a couple of years of observation around the CVOW research project. Again, there's a link to that final report there. I think, you know, what is no surprise is there's a lot of utilization by fish and other marine fauna around the base of those turbines.

Another big report that we did recently, that I think had a lot of attention, was around not fisheries species necessarily, but prey species for North Atlantic right whale, specifically in southern New England, around Nantucket Shoals. There was, I think, a lot of concern about how wind wake and the wake effect from the actual -- In the actual water column might affect prey availability for North Atlantic right whale in that area.

The National Academies of Science convened a panel to investigate this, and there's actually a great website, with a lot of videos, and I do have it linked down at the bottom of this slide, that you can actually see all the different presentations that the panel had on this topic, and, you know, there's a lot of models out there that are based on, you know, different assumptions, and so there's a lot of different published literature that, you know, make different assumptions in their models, but the bottom line is that -- I actually want to read this conclusion out, and it's -- I think it's important to understand that -- Sometimes, you know, there's so many different things that we get focused on, when we're doing our environmental assessments, that we're getting really narrowed-down into different effects, and sometimes we have to, you know, pull back up, and I think, eventually, that's what the people in this -- That wrote this report concluded.

It says the impacts of offshore wind projects on the North Atlantic right whale and the availability of their prey in the Nantucket Shoals region will likely be difficult to distinguish from significant impacts of climate change and other influences on the ecosystem. As planning and construction of windfarms in the Nantucket Shoals region continues, further study and monitoring of the oceanography and ecology of the area is needed to fully understand the impact of future windfarms. Advancing understanding of potential impacts is especially important as North Atlantic right whale use of the Nantucket Shoals region continues to evolve.

Again, I think it's important that -- There was no recommendation that, you know, that projects be halted while further study is done, and, again, the idea was that -- You know, that, even if you were able to detect effects, it's going to be very difficult to be able to distinguish those effects from natural variability and climate change, and so, of course, we will continue, and we do have a program to try to, you know, continue to investigate what is detectable, what effects we might see from the buildout in this area. We have two projects, and one is still under construction right now, a new wind project that is adjacent in the southern New England area, and there are lots of new projects up there right now active, looking at the impacts of the construction of these facilities.

I also did want to remind folks that we do have the National Academies Standing Committee on Offshore Wind and Fisheries, and that -- It took a little bit of a break, but I think we're looking to schedule the next meeting on this. This is a national group, meant to bring information and share ideas on fishing and offshore wind with BOEM, and I think we had some really good meetings to kick things off. There is the video online, again on the National Academies website, if you want to go back and watch those, but, anyway, it continues to be, I think, a good forum, in addition to forums like this where we can, you know, discuss topics of concern with not only fishermen, but fisheries scientists on this committee as well. I think that's all I had for today, but I'm happy to answer any questions and have some discussion. Fire away.

MS. CROWE: Brendan, go ahead.

DR. RUNDE: Thanks, Madam Chair. Brian, thanks for making the trip down, and thanks for an enlightening presentation. I'm glad that you brought up CVOW and the record of decision that was released this week, and we had Pace here yesterday talking about NOAA EFH, and you probably know that the EFH consultation on that project, in July, recommended the adoption of an alternative that would not construct, or would relocate, four turbines that would project a priority sand ridge feature that is considered EFH.

You probably also know, but, for my fellow AP members, a BOEM-funded study detected nearly 1,000 unique individual tagged Atlantic sturgeon over a five-year period in that lease area and the cable export route. The ROD that was released this week stated that, from Dominion's own analysis, and then an independent BOEM review of that analysis, that rebuilding, or relocating, those turbines would not be technically feasible, and I'm just a little fuzzy on what that means, and I'm hoping you can shed light on it.

MR. HOOKER: Absolutely. For every EIS that we've done to-date, we try to have a reasonable range of alternatives in there, and one of those has included a habitat minimization alternative, and so some type of alternative that's identified very early on in the process of, okay, is there any habitat in here that should try to avoid.

Every project so far has been really challenging to adopt those habitat minimization alternatives, because of the economic and technical feasibility of trying to relocate structures and the -- Sorry, and I'm trying to remember the -- The inter-array cables that are sited, and so there's a lot of geotechnical, and geophysical, work that has to go into, you know, where -- How to balance the power load within the facility and, you know, where exactly those cables can go and where the geophysical data has been conducted to support where those cables go, and so it's not just as simple, I think, as when we probably first went into those, as saying, oh, can't we just adjust those turbine locations, and there is ripple effects down the entire line.

There is still -- Even on top of not only balancing the power load and where the export cables are, if they had to be realigned, or moved, there is always the potential that you get to a site and it becomes unbuildable, and so therefore, you then have a record of decision where it's like, well, you're not supposed to -- You can't lose a turbine position if you get to a site and, for whatever reason, the sediment stability is not what you expected it to be, and so you need to have that flexibility in the plan to be able to relocate.

Generally, what we try to do is say, you know, if it is feasible, if you find that you don't need a turbine location anymore, avoid those areas that National Marine Fisheries Service has advised to avoid. This particular one, I think it was just a sand shoal feature in the southwest, where there is actually -- If you look at the cable array design, there's a lot of cables in that southwest area, that removing those from consideration was not going to be feasible.

Then, in addition, we had already removed, and working with the CVOW team, an area in the northwest that had a lot of complex habitat, and then there's the fish haven area in the direct north, where there's actually I think a wreck, and a lot of material that's been laid down as well, and so it becomes challenging, where it's like you've already removed some areas for habitat, at kind of the outset, and then you're going through the EIS process and identifying is there anything else that we can remove, in addition to what we've already removed, and in addition to where we sited it to begin with, and so those are all considerations we have to take into evaluating what EFH

conservation recommendations we can and cannot adopt. That's a very good question, and I hope that I answered it fully.

DR. RUNDE: Yes. Thank you.

MR. HOOKER: It is a challenge that we continue to work through, is like how do we continue to -- From an EFH perspective, the primary objective is to avoid first, and, you know, so we do look at that seriously, but we're not always able to do so.

MS. CROWE: Wilson, go ahead.

DR. LANEY: Thank you, Brian and Madam Chair. Brian, I have two questions. One is some of us were talking yesterday about the moratorium that apparently had been in effect under the previous administration, and is that gone now, and I picked up on that by the fact that you're indicating that there will be announcements for new leases in 2024, and so did that moratorium go away on offshore wind?

MR. HOOKER: I don't think there was ever a moratorium that was formal moratorium, or anything even under the previous administration, and so the only kind of thing we have in place now that is a challenge for new leases is that all new leases must have an oil and gas lease sale associated with it, and so that is still current, and that was under the Inflation Reduction Act, I think, or one of the permitting bills. Anyway, one of those did have the requirement that, for every renewable energy lease sale, there would need to be an oil and gas lease sale, and so that, right now, is probably the only somewhat challenging thing to balance as we move forward.

DR. LANEY: Okay. Thanks, and that clarifies that, and then my second question has to do with the fact that my ears -- Actually, my hearing aids pricked up at the term that you used there for those articulated mats, which is, quote, trawl friendly, unquote, and that causes me to ask the question of whether or not you think that -- Are trawlers going to be getting that close to these structures that we're concerned about, you know, interactions with the articulated mats and trawls, in particular?

MR. HOOKER: That's a great question, and so the articulated mattresses are used on the -- It's basically the inter-array cables and the export cables, and so around the base of the foundation. The base of the foundation will usually have like a rock rip-rap type of scour projection in different sizes, and, anyway, there's a whole method on how they deploy that, and there's actually a cool CVOW video, CVOW research, showing how they use chutes to put the rock around the base of the foundations, but, yes, and so it's like on the export cable, and so it's area -- It could be in areas where there is a lot of trawl activity, and so it's not necessary at the base of foundations, but, yes, there's definitely areas in southern New England that have been trawled in that past and that articulated mattresses have been deployed, and some snags, you know, have occurred in that area, and so there's a real focus on trying to minimize, you know, mattress deployment, and, if you do have to, that they be trawl friendly, so they have the tapered edges, so that the trawl can go over the top.

MS. CROWE: Anne, go ahead, or David.

MR. WEBB: This is more for Roger, but, in our last meeting, I think we started a dialogue about the decommissioning of these sites. I mean, all of this is focused on how to get them in, and what's the least offensive way to put them in, but the reason that I'm asking this question again, about where we are with that, is because, if the design of these is going to be focused on trying to encourage growth and accumulation of biomass, do they become essential fish habitat at some point? If we don't want to deal with that statutory problem down the road, maybe we should be looking at making them resistant to that, and so I know the arguments on both sides, and I'm just posing the question of where are we in that dialogue, and where are we going to go, do you think?

MR. PUGLIESE: I think our energy group will be probably further diving into those issues. Just, I guess, one of the first responses is I think it needs to be thought of in the total view, because one of the things that I see is, once you establish these, not only the benthic areas, but the pelagic, the higher portions of these, are going to be probably pretty significant fishing opportunities, and so, you know, there may be a lot of challenges about wanting to remove those, and remember all the nightmare that happened with the towers off of Georgia. I mean, the loss of those, and you lost the monitoring capability, and you lost the fishing opportunity, and you lost all types of things, and so I think that needs to be part of that whole discussion about, if you do it, that may be a valuable thing to keep, and it may have a very different perspective than it has in the past, in terms of getting rid of everything upon -- The decommissioning thing may not be as significant, and so maybe that could be factored in the other way, and so I think that needs to be part of that whole dialogue when we get into that.

MR. WEBB: Which, just to remind everybody, brings us to the conclusion, or at least the question then, of do we want to look at what kind of materials are going to be used in those cables, so that, if we're going to plan on leaving them in the water in perpetuity, we don't want to have to deal with, decades down the road, leakage of some toxic or non-compatible stuff.

MR. HOOKER: I might jump in on that too, because one of the things we do in our EFH assessments is we do try to look at, you know, that the materials deployed kind of mirror the environment where it is, and so a lot of what this study is is mostly around the foundations and stuff, but, to your point, yes, on an export cable, do you really want to have a material, you know, that is different than like the sandy area around it, or should you promote some of the materials that are resistant to growth, and I think they have a higher pH level, or something like that, in the concrete mix. That is a great type of EFH conservation recommendation that I could see, you know, coming from a project review, saying, if you are -- If you do need cable protection in an export cable, or in a particular area, that it not be -- That it be resistant to epifauna growth.

I will state too that, you know, just as -- Since we're on the topic of decommissioning, you know, as a reminder, there will be a decommissioning application that's required as well, and I know our EISs do evaluate a conceptual decommissioning, but, prior to -- I think it's like two years prior to, or at least a year prior to, decommissioning, a full decommissioning application is required to be submitted to BOEM, and, you know, our assumption of -- I can't hold the government to whatever it's going to do twenty-five or thirty years from now, but the assumption is that we would have to reinitiate EFH consultation and ESA consultation and everything around that decommissioning, and so, conceptually, we talk about it in our EISs, but, ultimately, twenty-five years from now, someone will have to make a decision on what's removed and what's left in place.

MR. WEBB: One more quick comment. Thank you. Which really emphasizes why we need to address these issues now, because, as the question that Dr. Runde posed earlier, you get into the technical feasibility, and so, when you're decommissioning, and you're going through a permit to get to decommissioning, but they say, well, because we did this and this twenty years ago, it's not feasible, and then we allow them to do it, and so just the more we can do on the frontend, and the more we can look forward and see what possible problems, or issues, that might arise, I think it would be better, and so thank you.

MR. PUGLIESE: Just one quick follow-up on that, and I think, again, the discussion about the conditions and the issues in those areas that you're doing the analysis are different than the South Atlantic, because we don't have the big trawl fisheries, and, in many cases, if the placement is done right on this -- I think that was where we also had the initial discussion about other opportunities. You may want to create those habitats, and then maybe have corridors to be able to run through trawl areas that they could separate, and so it may be, you know, a way to create even more beneficial things, because the condition is different in many of these, and they're not in the same type of -- You don't have the big trawl fisheries offshore, and many of the areas that have been proposed are looked at into the future, and so I think it provides a lot of avenues for, you know, innovative thought about where you may be able to go, and maybe even more advancements.

MS. CROWE: Anne.

MS. DEATON: Well, I was just going to say that was kind of my question that David Webb brought up, and it was like what is required with the decommissioning, but it sounds like you don't know yet, and you would have to do an application, and that would determine if you would have to remove the concrete mattresses, would you have to remove the concrete around the base of the turbines, if they are providing coral habitat and such, and so I guess the answer is you don't know yet.

MR. HOOKER: That's right. That decision would be made at the time of the decommissioning application, what would be left in place versus what was removed. The default is that everything must be removed, and that's the way the regulations are written, but you can ask for, and request, in a decommissioning application, that, you know, some things be left in place. I can imagine, and I think I've definitely heard from lessees, that they would probably like to leave the cables in place, rather than ripping the cables all back up, unless there is recycling and a high demand for all the materials that are in the cables, but, anyway, that's just an example of kind of what I've heard being discussed.

MS. DEATON: Then my other question is, I mean, the mattresses would only be where you can't go down, and isn't it at least six feet that you need to go down?

MR. HOOKER: Six feet below the mudline is the decommissioning standard, yes.

MS. DEATON: And that's preferred, because of the electromagnetic field, and so --

MR. HOOKER: Are you talking about the actual cable burial?

MS. DEATON: Yes.

MR. HOOKER: On the EMF side, the six feet isn't because of EMF, and it's because of aggression from other -- From trawling or from other activities, like anchoring, and it's to protect the cable from that. It does offer some, you know, reduction in magnetic fields, but the shielding of the cable itself is what really provides the most of the cancellation of all electric fields, and the reduction of some of the magnetic fields as well, and so both do provide some benefit, from that perspective, but it's really the cable shielding is what does most of that work.

MS. DEATON: Then one last question then, and how much do you think of those cables is going to have to have concrete mattresses on it, versus being buried sufficiently?

MR. HOOKER: That's a great question, and that's something that is included in the construction and operations plan, and so, once the construction and operations plans are posted on our website, and they do estimates, based on what the geophysical survey data is showing, and work with our engineers to confirm that, but it really depends on the geology of the particular area, and so I don't have -- I'm sure the Kitty Hawk COP might have an example of that, but I think, in the Mid and South Atlantic, I'm not seeing very much of that, and the only places where I'm really seeing that is where they have to cross a telecommunications cable, or some other type of cable that might already be there, and they're having to cross over it to get to their entry point onshore.

MS. CROWE: Brendan.

DR. RUNDE: Thanks, Madam Chair. I would like to go back, if we could, to the Tower Reef wind project.

MR. HOOKER: Yes, and I expect that you're going to raise -- Also, on the Tower Reef project, I want to thank The Nature Conservancy, because The Nature Conservancy actually developed a handbook on all the different materials that are available, and we used that handbook to pick some of these materials.

DR. RUNDE: Great. Now I don't have to do a shameless plug, and so that's good, but I still have a question about the slide, and so thanks for bringing that up. That little table there at the bottom, Brian, the far-right column says required for three-meter-squared coverage, and am I to take that to mean that these five materials that were deployed in the water this summer were deployed to that extent? In other words, there are five materials in the water, and are there three meters squared of each?

MR. HOOKER: Yes, at a minimum of three meters squared each. I think, because of just the size and shape of them, and they may not be exactly that, but, yes, that's my --

DR. RUNDE: Got you, and a --

MR. HOOKER: I didn't include one, but there's a camera mount -- There's some slides that are actually showing how the camera mount works, and I think it's just to be able to keep everything in that same field of view, and so every replicate is getting the same camera view of that area.

DR. RUNDE: How many replicates are there of each treatment?

MR. HOOKER: I will have to get back to you on that.

DR. RUNDE: Okay. I would love to know. Thank you.

MS. CROWE: Wilson, go ahead.

DR. LANEY: Thank you, Madam Chair. Brian, we had some discussion, in our energy working group yesterday, about data confidentiality and when that comes into play with respect to renewable energy projects, and I know -- I just wanted to clarify, and so the studies that you all are funding, the BOEM studies, all that information is out there, as far as I know, for public consumption, and, once again, I express appreciation to you and BOEM for making those data widely available, in contrast to some other federal agencies, who shall remain nameless, and then the one area that we discussed was some of the acoustic telemetry data that are being gathered I guess by the leaseholders, and I was wondering, and are those all going to be confidential all the time, or what happens when the leaseholder puts the acoustic receivers down, and they're picking up signals from animals that have been acoustically tagged by university or other researchers, and what -- I guess there is -- My question is I guess sort of a legal nicety there.

So you've got the company that may say, well, these data are proprietary, but then you also have the researcher, who is paying for that research, and so does the researcher have a legal right, if somebody, you know, who is maintaining data confidentiality picks up their animal on their receiver, and how does all that work?

MR. HOOKER: Wilson, that's a challenging one. Well, first, I will very quickly address the BOEM side. The BOEM contract is we'll release, you know, all the data, and, in our contracts, we do encourage the contractor to reach out to the tag owners of other tags, to try to include whatever information that tag owner is willing to share in our final report, and so we do encourage that dialogue, when it's a BOEM contract. As a matter of a fact, the telemetry project that we did with the Navy off of Virginia -- The contractor has submitted that final report, and we're going through the final release of that report right now, actively, and so we hope to post that on our website soon.

We did include kind of the raw results in the CVOW project FEIS, but the full report is still in BOEM's review process, but, yes, there is an issue where the developer presented data, or the developer collected data, and I think the biggest hang-up now is not whether they will release it, and I think they will release it, and it's just the timing of it. You know, they have to go through company processes of reviewing the data, and then publicly posting it on their website, and so that data will eventually be made publicly available.

Your question about how they include other tag owners' data, I don't have a great answer for you on that. There is really no obligation for them to necessarily reach out, and I do think we try to encourage, you know, them to go through either the ACT networks to share like, hey, these are the tags that we got in our array, but I'm not sure they would -- You know, it could depend on each individual developer whether that tag owner shares information about that tag, and they choose to put it in their report, or they're just sharing the data.

I think that probably the default is they will just share the data on the tags that they've deployed, but, you know, I think we have a forum, under the Responsible Offshore Science Alliance, to

encourage that, and, you know, encourage that data sharing. There are a lot of deployments of acoustic telemetry receivers in southern New England in particular right now, and being able to make sure that data is shared, and whether or not the lessee publishes data on tags that aren't theirs is kind of a different situation.

DR. LANEY: A follow-up, Madam Chair, and so thanks for that answer, and thanks for your encouragement of everybody sharing those data. You know, as a scientist, I think we all need to look for opportunities to paint a comprehensive picture of what's going on out there, and, obviously, the more receivers that are out there, and the more detections that occur, the easier it becomes to paint a comprehensive picture, and, of course, my interest, as you are well aware, goes back to Atlantic sturgeon, and what are they doing, and why are they doing it, and where are they doing it, in particular, and those -- What we refer to often as hotspots offshore are important for the fish, or at least we infer that they're important for the fish, because they seem to show up there consistently, particularly in the wintertime, again based on my very limited experience on the cooperative winter tagging cruises.

NMFS, when they designated critical habitat, you know, elected not to designate any offshore, to the best of my recollection, and they didn't -- They did it on a limited basis for estuaries, because they didn't have what they felt was a good, solid credible reason for doing so, based on -- I can't remember what they called those things, the biological something or other something or other, that they use for justifying critical habitat designations, and so, in the hopefully soon to be published ASMFC Fish Habitats of Concern document, we went ahead, because we didn't have to abide by the same rigid criteria that NMFS does for critical habitat designation, and said, hey, you know, we know these researchers, particularly off New Jersey and off New York and then off of North Carolina, in Duck, and we've documented these aggregations that seem to occur consistently.

We went ahead and said, hey, we think those out to be called fish habitats of concern, and so my interest in seeing a whole lot of data sharing take place is that hopefully somebody, at some point in the future, will try and put all those data together and paint a really comprehensive picture of what Atlantic sturgeon are doing, and when they're doing it, and maybe even, as more research is done, maybe some additional gastric lavage studies, or things like that, and we'll understand why they're concentrating in these particular areas out there.

MR. HOOKER: That sounds great.

DR. LANEY: You're right that it's theoretical, and I have to confess here, in the interest of full disclosure too, that those of us who have been involved in striped bass tagging for many, many years are sitting on, you know, a data mine of striped bass movements and growth and other things that remain unanalyzed. We've talked about it in the striped bass tagging subcommittee, literally for decades now, that we need to do something with those data, and we haven't made it yet, but we are still talking about it.

MR. HOOKER: Absolutely, and, Wilson, I will say that, when we first started this project, I think in 2005, it was because you were catching all those sturgeon in the striped bass ones, and we were like, oh, we should investigate this further, and so it's all related. One leads to the other.

MS. CROWE: David, did you have a question, or a comment?

MR. WHITAKER: You answered most of my questions, and I was wondering about the concrete mats, and you said they're compatible with trawling, and was that testing done in New England, with roller rig trawls, or has it been tried with trawls, like shrimp trawls, that fish hard on the bottom with chains?

MR. HOOKER: So I don't -- There hasn't been any tests, and I think you will get different answers, based on -- Depending on who you talk to, whether or not they're really trawl friendly, and I used that term in the -- From the perspective of how they were designed, how effective they are, and I think you will get lots of different answers from different fishermen with different gear configurations, and so I do not have any tests to show that, you know, they are successfully able to trawl over them.

MS. CROWE: Casey, I think you were next.

MS. KNIGHT: Yes, and I just wanted to follow-up, real quick, on the telemetry discussion and highly encourage the lessees to send the data to MATOS. North Carolina has done a lot of work with our telemetry array, getting that data suitable for MATOS, and, along with sturgeon and striped bass, you know, we've had some summer flounder telemetry tags out as well, and all of that information really feeds back into a lot of our management plans, and it would be very useful to have it in, you know, kind of that one-stop shop kind of place.

MS. CROWE: Thanks, Casey. Brendan.

DR. RUNDE: Thanks, Madam Chair. Brian, I wanted to ask about the Kitty Hawk South project, which you didn't talk about, of course, but we heard about the cable export routes yesterday, in Pace's EFH presentation, and I assume you're familiar with the current spiderweb graphic that shows one route going north, to Sandbridge or so Virginia, and then two southern options, one which would go through Pamlico Sound and one which would go I estimate 250 miles or something around Hatteras, around Cape Lookout, and come to shore in Atlantic Beach, and I am -- I suspect that the developer isn't in love with the Pamlico route, or the Atlantic Beach route, any more than most of the people on this panel might be, considering the EFH concerns, and I'm wondering if BOEM is requiring those cable export routes to stay on that map for some reason. In other words, if they're still technically feasible, do they have to stay there until someone -- Until some agency says we would never allow this, in an official sense, or how does that -- How can they eliminate those cable routes that they might not love?

MR. HOOKER: For different EISs, we do have different cable routes as alternatives, and so we can present them in an alternative type of format when we get to the DEIS process. Some may be eliminated prior to it ever getting to the DEIS, and then we don't carry it forward in our analysis, based on there might be other technical feasibility issues, or that the state, or the county, is like we will not permit this, and so don't investigate this anymore, because there's no way that cable -- That we would permit that cable.

They can be eliminated prior to -- Even if they're in the COP, and sometimes what we do is get a revised COP saying this cable route is no longer technically feasible, and, as a matter of a fact, a lot of our -- During the EIS process, as things evolve over like a two-year process, that EIS process, some alternatives are -- They become no longer technically feasible, even though we included them in the DEIS, and they're removed from consideration, are non-selected based on that criteria,

and so they can -- Yes, they can -- To answer your question, the short answer to your question is they can be removed at lots of different steps along the way.

DR. RUNDE: If I could, Madam Chair, a quick follow-up, and so, given that those three -- There are really five, but three cable routes that are currently under consideration, does that mean that Avangrid has to do the various surveys, the seafloor mapping, along all of those cable routes at this stage of the process? I'm just concerned about the feasibility, on their end, to map that entire -- You know, I'm thinking of the offshore one in particular, that entire 250 nautical miles or something.

MR. HOOKER: Yes, and they would -- If that one is going to be carried forward in our EIS, that does have to be mapped. Well, we have this new notice of intent criteria, where we're requiring it to be submitted prior to going to a notice of an intent to prepare the EIS, and so that's kind of some new criteria. The reason that I was hedging a little bit is because we have had, in some EISs, and, as a matter of a fact, there's one in southern New England, where they have a conceptual route.

They have it mapped, for the EIS purposes, all the way to close to inshore, but they weren't able to finalize the final landing point, because they weren't sure exactly where it was going to land, and so there was an EIS -- For EIS purposes, you can include some conceptual -- You could include some conceptual, and we're trying to get away from that now and requiring that, if we're going to consider it in an EIS, we want all that data upfront, and that's a fairly recent change through this -- Through what we call the NOI checklist, the notice of intent to prepare an EIS checklist.

I can certainly provide that to you as well, and so I think the Kitty Hawk South project would fall under that NOI checklist criteria, where all that data would have to be submitted, if we're going to consider it in the EFH assessment and the EIS, but, like I said, in the past, we have allowed some options to go forward. For EFH purposes, we excluded it and said, because we don't have that geophysical data, we can't do an EFH assessment, and, if that route is selected in the future, we would have to reinitiate the EFH consultation, and so a lot of information there, and I think you've got it, right? Okay.

MS. CROWE: Paula, go ahead.

MS. KEENER: Thank you. Regardless of whether this information is proprietary at this point, does the mapping -- Does the mapping information ultimately get fed into the Seabed 2030 project at the global level? Is there a connection with that?

MR. HOOKER: No, and I don't think a connection currently exists on that, and so we have -- You know, the interpolated products of the geophysical data is available. You know, they're in the EISs, and they're in the COP, and most of the details are in the COP appendices, and so I really encourage most of the -- There is a lot of COP appendices of benthic and geophysical habitat.

Some of it is proprietary and not included, and it will just be a non-working link on the site, and, once the project is approved, and I forget what our regulations say, but, after a certain number of years, that data can become available, and, as a matter of a fact, the Gulf of Mexico has a lot of experience with that, of publishing geophysical data that was collected as part of the oil and gas program, and so, in our regulations, there is like a waiting period, after which -- Like kind of the

raw data can be made publicly available, but, again, all the interpreted data is available in the COP, which is on our website, but it doesn't help with that database, and I would love to hear more about that database.

MS. CROWE: Laura.

MS. BUSCH: Thank you. I wanted to go back to Wilson's question about telemetry, and I just wanted to put a plug for the Navy. We require all of our researchers to put their data in the Animal Telemetry Network. It's in our contracts for them, and we'll actually pay for them to do that, but, also, regarding the Atlantic sturgeon, we have a lot of those telemetry networks that we partnered with BOEM. They did the offshore, and we did the inshore, around the Chesapeake Bay, the York River, and the James River, and I have that information, and those reports, if anybody is interested in getting those.

MS. CROWE: Thank you, Laura. Does anyone else have a question or comment? Go ahead, Brendan.

DR. RUNDE: If we have time, I've got a quick one for you. If you could go up to the central Atlantic call area, and so Areas E and F still appear on -- I don't know what this acronym means, but the OREP GIS layer that BOEM keeps active online. I believe I was told that those areas were deferred, and can you explain what that means?

MR. HOOKER: Correct, and so, basically, they were not selected to move forward to the next stage, but they don't entirely disappear, and BOEM could revisit those again in the future, because, you know, we did -- There was some selection criteria, and it was part of the call area, and so it kind of preserves the ability that we wouldn't necessarily have to go back out for another call for information and nominations again for E and F. You could, you know, move forward with another proposed sale notice area identification, just from a later point in the process, and so starting from scratch, and you theoretically could. I think -- Well, I'm trying to think.

I guess it doesn't exactly apply, but I was thinking, in Massachusetts, if you recall, we did have an auction for several areas, and we did get some areas that had no bids, and so those kind of went away, but then, a few years later, we were able to do another proposed sale notice for those areas, and they came back and eventually did get auctioned off in a second round, and so --

DR. RUNDE: Do you think that will happen with those two areas in the Gulf that didn't receive bids recently in the Texas auction?

MR. HOOKER: Who knows? I don't know, but it's the same process, and I think what they did there too is, you know, removed them from that round, and I think they're preserved, in the sense that, you know, they could resurface in a later auction.

DR. RUNDE: No further questions.

MR. HOOKER: Okay.

MS. CROWE: Okay. Anyone else? Roger.

MR. PUGLIESE: Brian, has there been any other discussion at the higher levels, in terms of opportunities with coordinating with IOOS, maybe stepping in and getting kind of a foot in the door as part of the requirements that maybe some of the collection be allowed, so that then it could be part of the overall IOOS system, and it just seems like this is -- We've talked about this is kind of plowing the same ground, and there are real opportunities to expand the ocean observing network systems, and, you know, with all that new structure, especially in our areas like our region, where we have literally nothing offshore, other than your fixed buoy systems and everything else, that are feeding the big models, and so the opportunity beyond just acoustics.

We could, you know, just be able to really enhance that, and I was just curious if there's been any discussion at the higher levels that maybe that becomes a coordinated effort between BOEM and IOOS to get some type of partnership built and then begin to -- The reason that I raise it is that there seems to be a willingness, from at least some of the individuals, especially with like Total and whatever, to investigate some of these type of opportunities. You know, if it came from a requirement, or a coordination, from the initial discussions with them, that might go further.

MR. HOOKER: Thanks, Roger, and I think, as Laura was mentioning, I think there definitely has been, from like the ATN perspective, from the IOOS perspective, of how to, you know, ensure that at least stuff that BOEM is doing feeds into those networks. As far as what the lessee does as well, I know that the other IOOSs have been having conversations with lessees about, you know, some of the data, whether or not we're talking about biological data or the meteorological data, and those conversations are absolutely happening, because I think there's a lot of interest in, you know, weather forecasting and, you know, the kind of data that they could be getting from the facilities could feed into better forecasts that might be handled by one of the IOOS nodes or directly into like the National Weather Service and stuff, and so, yes, those conversations are absolutely happening. Unfortunately, I probably don't have enough information to tell you exactly where those conversations are.

MR. PUGLIESE: Really, just as long as it is actually happening. I mean, that was just really -- Because I know, if it does go into that level, then at least you have some real opportunity to see this go further, because I just think, you know, in our region, if we would -- Can you imagine if all these different areas became part of an array system, and then we had discussions, back when Rick Robbins was coordinating as the lead for the fisheries evaluation for that, we talked about maybe even enhancing and adding to the fishery-independent survey capabilities, and so, I mean, there's just some real opportunities that we have, and so, if you get hit from high to begin those discussions, it may be able to go even further with some of the direct coordination we have with some of these lessees as they kind of step to the table and want to get things going.

MR. HOOKER: Thanks, and I think there actually are some permit conditions for the projects that we have done on sharing that, but, when I sit back down, I will probably send a whole list out to the whole AP on a bunch of different things that we've touched on, and I will try to dig that up, too.

MS. CROWE: Wilson, did you have another comment?

DR. LANEY: Yes, and thank you, Madam Chair, and so thanks for that question, Roger. That's a good one, and it occurs to me to ask two questions, and one is I guess -- Do we consider, Brian, that -- Is wind a public trust resource? That's question one, and I guess the ocean would be

considered a public trust resource, and, at least in North Carolina, everything from the high tide line down is state waters, and so that's public trust, but the other question is has there been any sort of discussion, along the lines of the question that Roger asked, about companies providing -- You know, monitoring for weather or other metrics of interest, to researchers and/or the public, as part of the mitigation package for these projects, and has that come up at all?

MR. HOOKER: It absolutely has come up, and I know that the Fish and Wildlife Service, in particular, I think has been -- You know, they have some interest in production and up time and down time and things like that. How much of that data -- You know, a lot of that production-type data is proprietary.

I know you're trying to speak more to the meteorology and oceanography side, and so some of that we are working to try to -- You know, to try to make that available, and, as I mentioned, the National Weather Service, in particular, and other NOAA line offices, do have an interest in that data, and they're trying to work out how that data can be shared in a non-proprietary way, because you do have these data control centers that get all the data, but how do you separate the data streams and such that the proprietary stuff stays proprietary, but the other information can feed into, you know, ocean observer networks and other resources. I think some of that is still being worked out, but it's definitely an area of active discussion.

MS. CROWE: Okay. Great. Anything else? That was a great discussion. Thank you, Brian, and thank you, everyone, for your comments. I think, before we move into our energy policy update, we're going to take a short break, and so maybe meet back here at 10:25.

(Whereupon, a recess was taken.)

MS. CROWE: Okay. If everyone wants to take their seats, let's get started with the energy policy. Okay, and so next up is Paula, and we're going to hear about updates on the development of our EFH policy statement on energy.

MS. KEENER: Thank you, Stacie. So I am going to be covering Items 5a and 5b combined on the agenda, and I would like to recognize the current working group members, and they are Anne Deaton, Wilson Laney, Brian Hooker, Stacie Crowe, David Whitaker, Laurent Cherubin, and Brendan Runde with The Nature Conservancy, and Tom Jones. If I missed your name, please say so now, and, after this presentation, if you want to join our working group, please let me know.

All right, and so our -- We decided, at our last working group meeting, which was our first working group meeting, at the May Habitat Advisory Panel meeting here in Charleston, on an overall approach that we would take to revise the policy to address wind, and here you see the topics that we discussed. We wanted to be forward-thinking, and we've heard a lot about that this morning, and we wanted to consider the uniqueness of our region in the policy revision.

We also wanted to make sure that we took a life cycle approach to the entire project, also addressing, of course, decommissioning and siting, from siting to decommissioning, and we discussed new EFH considerations, some of which you heard during the last presentation, and we recognized the importance of exploration and the fourth dimension of time and the importance of research and development that these platforms can provide, and we also discussed academic collaborations, and collaborations with SEAMAP and SECOORA and other organizations, and

you've heard a little bit about that previously today, and we also want to consider stakeholder engagement considerations, and I thought a lot about this during Rua's presentation earlier, with 140 different groups that he is involved with, and also acknowledging that this policy is going to cross over not only federal and state governments, but also communities, local communities, regional governments, et cetera, and so we need to take that into consideration.

To date, we have -- We're running behind schedule, due to factors that none of us can control, and we have established a working group Google folder, and, in that folder is not only the current draft that we are working on, but also other supporting documents, and so it's an evergreen folder, if you will, and we have received initial comments on the first draft, including a draft table of contents, and I would like to thank the members that have been doing that, and working on that, so far.

I reached out to BOEM and to NOAA and to the New England Fishery Management Council, and I was able to have a great conversation with Michelle Bachman from the New England Council, and she -- We talked a lot about organization of the document, additional resources, the importance of data sharing, which we've discussed already this morning, coordination of cabling and the bidding credits, and, also, collaboration with the habitat working group, and I don't know if that's the correct name of the group, and it meets once a month, and Michelle is on it.

MR. PUGLIESE: Yes, and it's the CCC, the Council Coordinating Committee's, habitat workgroup, and I served on that, and Kathleen will serve on that in the future, and Michelle Bachman is also on it.

MS. KEENER: Okay. Great. Thank you. We held a side meeting of the working group yesterday, after our meeting of the AP, and we made some headway. We also, at that meeting, discussed the importance of ROSA, which is the Regional Ocean Science Alliance, and they also are involved in an upcoming synthesis of the science meeting, and I'm going to turn it over to Brendan right now to talk just a second about ROSA and explain what that is. Thank you.

DR. RUNDE: Yes, and so ROSA was formed as a Northeast regional organization, and I won't get into everything that they do, but it has to do with offshore wind, fish, and fisheries, and they sort of complement the RWSC, which is the Regional Wildlife Science Collaborative, just to continue the alphabet soup, and so I just sent a quick note, last night, to Mike Pol, who is the research director for ROSA, about whether they have plans to expand the spatial coverage of what ROSA concerns themselves with down into our region.

He replied back, and CC'd their executive director, Renee Riley, and they both said that there are discussions about this, and they don't know which way it's going to go, but that ROSA is currently working on its strategic plan, and that will be coming out in the next couple of months, and there will be further clarity, in that strategic plan, from their board of directors and advisory council with respect to regional expansion, and so, as of right now, they only go down as far as North Carolina, and so the state representative for North Carolina on their advisory council is Chris Batsavage, who sits on the Mid-Atlantic Council, but there are also representatives on ROSA's advisory council from the Mid-Atlantic Council, the New England Council, and GARFO, and the Science Center, Northeast Fisheries Science Center.

So, what that would look like, if it were to expand to include the South Atlantic, is each state -- So presumably each state agency, and I don't think North Carolina would get two bites at the apple, but presumably South Carolina, Georgia, and Florida would cough-up a representative from the state agency, and then SERO and the Southeast Science Center would also have, and the South Atlantic Council proper, would also have reps, and so that's just a look behind the curtain of the mechanics there, and so stay tuned.

MS. KEENER: Thank you, Brendan. Would you also address the upcoming meeting in July in Long Island?

DR. RUNDE: Sure, and so this hasn't been officially announced, and so NYSERDA, which here's another acronym that I can't remember, but it's the New York state governmental body that deals with renewable energies, and people in the room probably know the acronym better than I, but, nevertheless, they, and the Biodiversity Research Institute, and some others, host a meeting called the State of the Science on Offshore Wind and Wildlife. It's an in-person conference, and it happens every two years. It started in 2018.

The 2022 meeting was one of the best scientific conferences I've ever been to, and there were great presentations about offshore wind and impacts on wildlife. This meeting will happen again in July of 2024, and it's July 16 through 19, and it will be on Long Island. The precise venue is TBD, but, if you folks are interested in offshore wind and wildlife, which I think pretty much everyone in the room is, mark it down on your calendar, because that's going to be a great meeting. For the first time ever, it will actually include a dedicated fisheries track, and so there will be talks, perhaps throughout the entire conference, about fisheries and offshore wind. If you can care to, you can listen to talks about birds and bats and transmission problems and things like that as well, and so a lot to learn there. It won't just be scientists and agencies, and there will be a lot of industry participants at this meeting as well, and so, yes, save the date.

MS. KEENER: Thank you, Brendan. Next up, we are going to have a working group meeting during lunch today, and so we just figured this out this morning, and Brian is here with us, and so that will be a great opportunity for us to have some conversations offline with him. We are planning, right now, for a first draft to be completed in April of this upcoming year, and so that's about five months away, and that draft we are hoping would be ready, at that point, for the May 2024 Habitat Advisory Panel meeting.

I'm going to open it up to all of the working group members to add what they would like, but I will finish by saying that we really view this as an opportunity, the redrafting of this policy to address wind, as an opportunity to create, in our region, novel partnerships, novel approaches to research and development, and use of innovative technologies to use these platforms in ways that they've never been used before, and so I will turn it over to the working group members now. Thank you.

MS. CROWE: Anyone from the working group? Wilson, go ahead.

DR. LANEY: Thank you, Madam Chairman, and so one thing we discussed in our working group meeting yesterday afternoon was the need for getting input from the rest of the AP, and possibly the council, about whether or not, in the course of updating the energy policy, we should roll wind

in with everything else or have a separate renewable energy wind, and I guess it would focus on wind, policy.

We still would have to update the existing energy policy, and update all the other types of offshore energy as well, but I will just throw the question out there, and what does the AP think about that? Is it better to have wind separate or combined, and Anne had pointed out, yesterday, that we could -- You know, we could move wind to upfront in the policy and then just update everything else, but still keep it all together in the same policy, and that has appealed to me, for the simple reason that, if we do it that way -- If we separate it, it seems, to me, we would have to discuss the affected habitats twice. We would have to do that in the oil and gas and other energy policy document, and we would also have to do it in the wind document as well. If we keep it together, we just have to do it once, and so I think it would be a little bit more efficient if we do it that way, but, anyway, I will shut up and see what everybody else thinks.

MS. KEENER: Thank you for bringing that up, Wilson. I just want to add that what initiated that conversation was the fact that New England's energy plan, and the Mid-Atlantic's energy plan, are in fact separate documents from the oil and gas energy plan, and so that's what initiated the discussion about the organization of the document, and, also, considerations about climate change, separating it out from the oil and gas in a pretty significant way, and I believe that it would be a council decision, but I'm going to be quiet and let other members chime-in.

DR. RUNDE: I just wonder if council staff has any recommendation on consolidating, or splitting up, wind and the other energy sources, as far as -- I mean, I don't think anyone wants to create additional logistical burden, and so, to Wilson's point, maybe it's easier to lump rather than split.

MR. PUGLIESE: I think, in the past, we actually have lumped -- Like, when we dealt with the invasives, we rolled them together. We had separated those, and we pulled those together. There's a lot to be said about separating, in terms of distribution, specific to this issue, if you wanted to highlight that, but then there's also the issue that Wilson has identified, and then you go through having to kind of re-add all the impacts to EFH and different things like that, or you could create a two-part document, and so it essentially accomplishes both.

I see, you know, there is multiple avenues, depending on what you really feel the strengths are going to be about having -- It's good to have it, because -- The one reason I think it's good to have it is it emphasizes how much the council has historically, you know, really put down, in terms of all of these other types of energy activities, and so maybe that idea of moving the wind to the front, and then having more of almost the historic foundation in the back, that may be a way to accomplish both, by making sure that you have wind highlighted in the front, and it's just thoughts I have, but, yes, I know that they had developed those separately, because they had really focused -- They had a lot more going on in wind, and so they had to focus kind of on that, and so I know New England kind of really almost had to do that, because of the nature of the beast.

We have been dealing with this for so long that we've covered everything, and so that's really more of a call from your ideas, in terms of guidance to the council, and then, if the council sees that as a benefit, they could, you know, maybe make a recommendation on that, but those are my thoughts, in terms of the benefits of kind of different avenues to take to accomplish what you're trying to do, because I think the biggest thing is to make sure that wind is highlighted, and it's provided, and it at the forefront of this, because that's the direction -- Because I don't think there's

any intention of seeing oil and gas exploration in our region. This policy was used effectively to, you know, try to deal with that in the past, and so at least those are some thoughts from me.

MS. KEENER: Thank you.

MS. CROWE: Does anyone else have any thoughts? Anne.

MS. DEATON: I had a question about the timeline then, and would that work with the EFH amendment? That's what we want to make sure.

MR. PUGLIESE: Your EFH review really doesn't have to be done until the end of 2024.

MS. DEATON: Okay. That's what we didn't know, and so thanks.

MR. PUGLIESE: That is part of the process, and so, yes, it would work fine.

DR. RUNDE: One more thing, if I may, and our decision, right now, pertaining to lumping or splitting, is -- I mean, we can walk that back later, in one way or the other, right, and, I mean, this isn't like a final --

MR. PUGLIESE: No, it's not absolute, and, truthfully, the way you're developing it, you're already -- Because, really, you were going to focus one whole section on wind, and really get all that material together, and so you kind of are in that phase where you're going to develop all of this, and you're going to review all of that, and then however you want to deal with the final product is -- You know, you can make that decision as you're getting to that next stage. As it makes sense, you know, all those different options that I laid out, but you are really literally going down the road of creating those, to be able to focus on either one of those, as needed, and so, yes, you can make that decision as you evolve.

MS. KEENER: Kathleen, go ahead.

MS. HOWINGTON: All right, and so, just for clarification, and I was planning on adding this into Other Business, but it's here. Currently, we're actually looking at April 22 through 24 for the next Habitat AP meeting. Unfortunately, it's not going to be in May. We're hoping to be at this hotel. This is not in stone at all, but go ahead and pencil in April 22 through 24 for the next Habitat dates. Like I said, not stone, and don't use pen, but I did want to just go ahead and clarify that unfortunately -- An early May completion, or early April completion, would be ideal. Thank you.

DR. RUNDE: When do you expect that to be finalized?

MS. HOWINGTON: Hopefully after the December council meeting, and we'll get into this discussion later, but, with the blueprint, and the transition to the new workplan, I'm waiting until after that to finalize that, those dates.

MS. CROWE: Anyone else have any comments or suggestions or input or anything?

MR. PUGLIESE: Just thank you all for all the effort to get this far. You know, the energy policy, in the past, was a very significant effort, and the history way back to when they even were

proposing discussion of drilling off the Florida Keys, if you want to believe that, and so I think advancing into the new generation with wind, and really getting in here, and all the opportunities that you've highlighted I think are critical, and so you're doing some pretty amazing things to get that to the next step, and I think it's going to affect where everything goes in our region, which is really important, and so just thanks.

MS. KEENER: Thank you.

MS. CROWE: Thanks, Paula. Okay, and so up next then is Laura, and she's going to give us a presentation on the U.S. Navy Atlantic Fleet Training and Testing EIS.

MS. BUSCH: All right. Thank you very much to the panel for allowing me to present this today, and, again, my name is Laura Busch, and I'm with the U.S. Fleet Forces Command, and we're out of Norfolk, Virginia, and my four-star admiral is in charge of all training and all the boats and ships on the east coast and the Gulf of Mexico, and so we're going to talk about our at-sea environmental planning, our compliance history, real quick, and our upcoming -- We call it the Atlantic Fleet Training and Testing Environmental Impact Statement, EIS, the mitigation process that we go through, and then I'm going to focus in on some of our mitigation for habitats and seafloor resource areas and then the public engagement next steps.

We do conduct environmental planning for at-sea -- We call them our at-sea documents, and we have five of them across the Navy. You will see that the Atlantic fleet training and testing EIS takes up all of the Gulf of Mexico, the east coast, and it goes out to what we call the chop line, and so, when our ships leave that line, they are out of the CTF 80 area, and they go into the 6th Fleet area of responsibility.

With that, we look at Marine Mammal Protection Act, the Endangered Species Act, Magnuson-Stevens, National Marine Sanctuaries, Coastal Zone, and National Historic Preservation Act, and those are kind of our big ones that we look at for these documents.

Why do we do that? We are required to follow environmental laws, but it also helps us look at our impacts of military readiness activities and then find out where we can minimize effects on protected resources while we're conducting those activities, and our compliance also helps us maintain access to our areas where we train and test along the east coast and Gulf of Mexico.

Here is our study area, and we're kind of focused in on just along the east coast of it, and you will see these colored boxes are what we call operating areas, or op areas, and so you may have heard of VA Capes op area or the Jacksonville op area. That's where the bulk of our activity occurs, in those boxes. It's kind of close to home, and the ships don't have to be out away from port as much, and they can get in and get out. Up in the left-hand corner, you will see that I've kind of zoomed-into the Chesapeake Bay area, and we do have some inland waters that are included in our study area, and then I will also note that our study area does cover over 2.6 million nautical miles of ocean area. We have eighteen states and two territories and five national marine sanctuaries, and so our numbers do skew Pace's EFH consultations a little bit when we submit those, for the number of acreage that he looks at.

This is kind of the same map, but, again, up in the left-hand corner, for this round, we added some commercial shipbuilding facilities up in Pascagoula, Mississippi and New Orleans that were not

in our previous document, and those are just for the ships that have been built to come out of those shipyards and down into the Gulf.

Just kind of quick, on our compliance history, we started -- We signed our first ROD in 2009, and we had seven EISs. We only looked at fourteen sources of sonar and ten sources of explosives, and then we've kind of evolved, and we're now in the fourth phase, but, through Phase 2 and 3, we consolidated into one large EIS that you will see, or that you saw the study area for, and that's where we increased the number of sonar sources that we looked at, and the number of explosives, and so, now that we're starting our fourth phase, we have gone to a supplemental EIS, and so we're kind of narrowing our focus to just our permitted activities and kind of significant changes, such as the new locations in the study area. We're also working on improving our acoustic effects model and our exposure criteria that we look at and incorporating new science into the document.

Our proposed action is to continue training and testing in the study area, for the reasonably foreseeable future, and our purpose and need is to maintain, train, and equip combat-ready Naval forces, which is our Title 10 requirement, and then, also, National Marine Fisheries Service is a cooperating agency in our document, and their purpose and need is to determine whether or not they can issue us a permit under the incidental take regulations for our activities, and so we're just getting started. Our notice of intent will be published in the Federal Register on November 17th, and so get ready to see that out there.

This is just kind of a quick overview on how we do that. We do take our requirements, our activity data, and we break that down into stressors, and I will get into that in a little bit. That information, along with our environmental inputs, goes into the Navy Acoustic Effects Model, or NEMO, and we do a bunch of simulations, and we come out with a document. It takes a little bit more than that, but so here's kind of just some of the activities that we look at.

We have primary mission areas, which is where all of our activities are categorized under, and you will notice, you know, air warfare, surface warfare, expeditionary warfare, and then some of the different activities that are within those different primary mission areas. Vessel movement is captured in all of these activities, and kind of analyzed separately, and we also do look at our potential for ship strike, based on how many vessels we have out there, how many steaming days that we have out in the study area.

The stressors that we look at, this is how we break it down, and so we analyze according to acoustics, explosive energy, physical disturbance and strike, entanglement and ingestion, and then we look at how those stressors impact the biological resources of vegetation, invertebrates, habitats, marine mammals, birds and bats, reptiles, and fishes, and so, within the reptiles, we have the turtles, and we also have the American crocodile and the American alligator within our study area, and so, birds and bats, we do analyze those together, realizing that bats should probably be in with our mammals, but, because of the way that we analyze our activities, it's easier to analyze those guys together.

Here is our environmental inputs that go into the model, and we have, on the left-hand side, your windspeed and bathymetric, sound speed profile, to create a sound propagation layer, and that's our physical data, and then our density layers -- We have density layers for thirty-one marine mammal species and the turtles -- Most of them we have monthly, and some are seasonally though, and these density layers are available to the public, and they're on a website called OBIS-

SEAMAP, and you can Google that, or I can send a link, and you can download these different layers, if needed.

Then the model takes all of these inputs, and we run simulations. We run over six-million simulations to come up with our analysis, and you can see, kind of on the right, a cartoon graphic of what they do. They put in the ships, and all the different sound sources are together, and then we have -- Simulated animals are called animats, and they're placed in the water column, and then we determine how those animals are affected by the sound, or the explosives that we use, to come up with a take number, and that's our acoustic effects analysis, and then we write a document.

Some of the research and monitoring that we do, we are a leader in marine mammal research, investing over $20 million a year, just behind NMFS in how much we invest every year, and we're mostly looking at effects on sound and marine mammals, just because of the nature of what we do, but we also do research on other resources, such as turtles, fishes, corals, ocean bottoms, and marine habitats as well, and we mentioned the Atlantic sturgeon project that we did in the Chesapeake Bay, and we did find a spawning population that was unknown before that, off of the York River, and I can't remember if it was in the Mattaponi or the Pamunkey River, but one of those rivers that we did find a spawning population that was unknown before we started putting those acoustic telemetry points in.

I manage the Marine Species Monitoring Program, which I just look at how the training affects marine species, and we're mostly trying to look at species distribution and abundance and then habitat use, and the biggest thing that we're now looking at is behavioral response.

Some of our monitoring projects, the big one that we do is a behavioral response study, and we're doing that with Duke University and Southall Environmental Associates, and so they will go out a few days before a ship is ready, and they will tag pilot whales and beak whales, and they're mostly trying to figure out how beak whales respond to sonar. Pilot whales are much more plentiful around the Cape Hatteras area, and so tag those. They will follow them for a few days, to kind of get a baseline of their activity, and then, when they're ready, we have a Navy ship standing by that will turn on sonar, and we know that the animals are a far enough away distance not to be potentially injured by the sonar, but kind of close enough that we can measure if there is any type of reaction, based on that sonar, and so we've been doing that the past few years, and will continue that for a few more years, to try to determine how these animals react when they hear sonar in the water.

We do have a great little video on that, if you search -- Well, I will have the -- Sorry. The previous slide had the marine species monitoring website on it, and we have some videos on there that talk about these different types of activities, or projects, and the other one is the North Atlantic right whale monitoring, and so we're doing a lot of that as well, and there is a great video that NMFS has on their website, and it was a whale that we tagged, and it layered that with the AIS ship data, as that whale moved north from the Mid-Atlantic back up to the Gulf of Maine, and the number of times that it crossed a ship path is just amazing, and it's surprising that whale was never hit, but it's quite interesting to see the data of the movement of the whale and the ships, and so that's one of the things that we've been doing.

We're also doing baleen whale monitoring, trying to figure out how whales react to ship movement, and the photo here are some humpback whales that were taken, and that's the

Chesapeake Bay bridge kind of in the background, and those guys love to hang out in the shipping lanes coming out of the Chesapeake Bay, which, obviously, our ships use as well, and so we're trying to determine why they like it, and we think we know why, but ways that we can reduce impacts to them while they're there.

We've also got some projects in the Gulf of Mexico, for the renamed Rice's whale, trying to determine their use of habitat there, and then, finally, the passive acoustic monitoring, and we have a total of sixteen locations that HARPs have been deployed, and we've had anywhere between four and two in the water, and then we are joint with NMFS, with their buoys that they have in the water, and so all the data that we collect we send up to their lab, to analyze all together as one large dataset, and so that's pretty much covering the entire east coast, and that synergy of data will help us understand marine mammal use of the area.

Another project that I want to talk about, real quick, and I missed putting it on the slide, but we're trying to look at how pile driving affects sturgeon as well. We originally got some sturgeon from Maryland DNR, and it was a Canadian stock that they were ending a project, and so we took those sturgeon and took them to Pax River Air Station. We've got a pond there where we put them in, and we were kind of holding them until we could get some pile driving to occur.

Unfortunately, once we got NOAA Headquarters out there, and Sam Rauch and Kimberly Damon-Randall all came out to the air station, and we had a big day, where we were going to pull those fish out of the pond and tag them and then move them to where we were going to do the project, and we didn't have any fish. They were all gone, and we have no idea what happened to them, and so now we're trying to get some fish out of a hatchery down in Georgia, and so we'll truck those back up to Maryland. They will go right into the pond where we're going to do the pile driving. We'll tag them, and we've got some sensors out in the pond, and to see how they react to pile driving, and so that's one -- Hopefully that will happen in the spring.

Some of the mitigation measures, we kind of have three different categories, and we have lookouts that are always on the ship. Whenever a ship is moving through water, there are different lookouts, generally on the bridge wings and the tail of the ship, and then also the bridge, and they're looking for any type of -- Anything that could be a hazard to the ship, such as enemy periscopes or trash in the water, and also in case there's a man overboard, and then they're also looking for marine mammals, and they're required to notify the bridge when they see a marine mammal or a sea turtle, and we also have them look out for large concentrations of seabirds, and that generally indicates that there's some mammals in the area as well.

We have procedural mitigation zones, and so that's where there's a zone around an activity, and, if they see a marine mammal, or a turtle, or any type of marine resource, they have to halt the activity and wait until that animal leaves, or they move the activity to another location, and then, finally, we have geographic mitigation areas, and that's kind of -- On the map, you can see some of the areas that we have where we do have geographic mitigations, and these are mostly for the North Atlantic right whale. There are some sandbar shark mitigations in here that I will get into a little bit later, and you can also see the Rice's whale mitigation area in the Gulf of Mexico. Then we also have some mitigations for corals and seagrass that would fall under our geographic mitigation areas.

This is kind of a map from our upcoming EIS, our habitats and seafloor resource areas, and so we try to map as much as we can, and we're gathering data, from anywhere that we can find data, and kind of put this in the habitat database that we have, and that's kind of a hierarchical database, and so, when we get finer-quality data, that overlays the coarse data that we do have, and so we're building that habitat database up, and we use that in a protective measures assessment protocol tool that I will get into later in the presentation as well. Then I just kind of zoomed-in to south Florida and some of the different areas that we have mapped, and then overlying with some of our op areas and things.

Some of the actual mitigations that we have, and I'm not going to read this whole slide, I promise, but this is our general mitigation for artificial reefs and live hard bottoms and aquatic vegetation and shipwrecks. They're not allowed to do anything within 350 yards of these locations, except we do have an exception of Truman Harbor and a place called Demolition Key, down in Key West. No anchors, no explosives, no seafloor devices within these areas.

Another one we have is the Navy Cherry Point sandbar shark and sea turtle mitigation area, and so this was originally an area that we had to protect sea turtles, and then, under an EFH consultation with Pace, and he noticed this and said, hey, this will protect sandbar sharks as well, and so we included those in this mitigation and expanded it a little bit to get their entire habitat of particular concern area. Then another one that we have is the Key West seafloor mitigation area, and this, again, came through an EFH consultation, and so we do not operate surface vessels in waters less than a foot, to avoid any type of scour there.

This is the protective measures tool that I mentioned, and so this is an online software tool that every unit is required to run before they conduct an activity. I just kind of zoomed-in on one and protected that we were going do a mine neutralization area, or a mine neutralization activity. You pick a location, and it's hard to see on here, but there is a little dot kind of thing on one of those green shipwreck, or it's the artificial reef buffers, and so the unit goes in, and they select their location, and they hit "run", and then it will tell them all of the mitigation measures that they have to do in order to conduct that activity, and so that one kind of yellowish-beige area along the coast, that's the sandbar shark and the turtle mitigation area, and so, if they dropped a dot in there, and said they wanted to do something -- If it was explosives, it would tell them that they're not allowed to do it.

The same with the little green dots. Those are artificial reefs, and so, again, if they selected a location that was within 350 yards of those, it would tell them it was not allowed and request that they move it to another location, and then the yellow kind of lines are our hardbottom areas, and so, again, it's to protect those as well.

Our next steps, like I mentioned, we're going to publish our notice of intent on November 17 that we intend to do an EIS, and we'll start having some public meetings in October, and so about a year from now, and we'll have a sixty-day public comment period, and we're expecting to get a record of decision on October 3, and our permits do expire in November of 2025, and so we're working towards getting those up, and so I guess I neglected to mention that our Marine Mammal Protection Act permits are for seven years, and so we have to start to do this process every seven years, and we're on the fourth phase of that, and so I will take any questions, if anybody has anything.

MS. CROWE: I think Wilson had his hand up first, and so we'll go Wilson and then Brendan.

DR. LANEY: Thank you, Madam Chair, and so, Laura, I have three questions. The first one is whether or not you know -- Is there enough data out there to create like bird or bat density areas, like you've done for the sea turtles and the marine mammals?

MS. BUSCH: I don't know. Not offshore, and I think there just isn't enough surveys to develop those. One project that I am trying to work with is we're trying to put bat recorders on ships, so when they go out to sea, to see if we can pick up any bats that are out there migrating, because I know they've shown up at some of the windfarms and stuff, and so that's one project I'm trying to get going.

DR. LANEY: Okay, and, for the birds, I know there's that -- Let me see if I can't remember the right acronym, but MODIS or something, where they can track birds that are -- That have transmitters on them, I guess, electronically, and so I wondered if that might not be a source, and I'm sure the Fish and Wildlife Service would be interested in any sort of efforts to try and develop a bat or bird density profile, and I agree with you that there just probably isn't very much data for offshore to do that.

My second question is I know there's probably -- Based on past conversations with Carter Waterson and other folks, that a lot of Navy data are classified, but I was wondering if there might be a possibility, like through the Office of Naval Research, which at least used to exist, and does it still exist?

MS. BUSCH: Yes.

DR. LANEY: So ONR is out there, and they have scientists working for them, and I wondered if there might be the possibility for some collaborations, you know, say between academia and ONR, that might perhaps be able to tap into some of the classified sources, especially if the Navy has detection gear out there that is picking up these pinging acoustic signals from fish tags, and I will just leave that as more of a comment, and you and I can talk about that offline, maybe, and I don't even know whether that's a possibility or not.

The last question has to do with plastics, which is something we hear a lot about these days, and what's the Navy's policy with respect to plastics on ships? I mean, there's a whole bunch of ships out there, and I'm sure there is plastics on them, but with respect to, I suppose, recycling and/or disposal, but is there -- Has that been discussed as an area that is in need of mitigation as well, and, particularly, you know, we were talking earlier about decommissioning of windfarm facilities, and I guess Navy ships, at some point in time, undergo decommissioning as well, and so I was just wondering, generally, what's the Navy's policy toward plastics, and how do you deal with them? Thank you.

MS. BUSCH: Excellent questions. I've got two answers, and I neglected to mention, and so, as part of our consultation last time, regarding corals down in Key West, there was a concern about some of the what we call military-expended materials, and so those are the things that, when we drop sounding buoys in the water, they come with a parachute. When we shoot torpedoes, they come with a guidance wire, things like that, that do go into the water, but it's not dumping, and it's used for its intended purpose, and so we conducted a study where we contacted twenty-seven

researchers down in Key West, and we did phone interviews, so that we could follow-up and ensure that we were getting the answer, that they were understanding what we were questioning, and we asked them if they had picked up anything that could look like military-expended materials when they're diving or doing coral research.

There was none that they attributed to military training, and most of the debris that they came across were fishing gear, obviously, coolers, hats, things like that, and so we're kind of hopeful that we're not having an impact on corals down in Key West, due to some of our activities down there.

As for shipboard plastics, all plastic, human-generated plastic, as in, you know, your shampoo bottles, your toothbrushes, all of that stuff, all the Navy ships have a plastic incinerator, and so all plastic is separated, and it's dumped into a large hopper that it compresses and heats that plastic into what we call a puck, and so an aircraft carrier has roughly 5,000 people on it, and they will make about 300 of those pucks a day, and they hold those in the ship until they are able to offload them into either a landfill or an approved area where they can get rid of them. No plastics go overboard. No human-generated plastics go overboard, and they all are maintained, or kept on the ship, until they can be disposed of.

They do pulp their paper, and they pulp that up with the food, and that does go overboard, and then glass they're able to put overboard, outside of three to twelve nautical miles, and there is different rules for different things that they are able to throw overboard, but all the plastic is kept and put into these plastic pucks. We're trying to work with industry to recycle them. The problem is that they are not heated enough to kill bacteria, and so these things have to go in plastic vapor bags, because they smell horribly.

They're also a mix of plastic, and they just don't have space on the ships to separate your different numbered plastics, and so it's just kind of everything together, and so it's bread bags and shampoo bottles, and anything that is plastic goes in there, but we are trying to work with industry on ways to potentially recycle these things, once they come off of ships. The newer ship, the Gerald Ford, does have a -- I don't know a whole lot about it, but it's a laser arc disposal, and so it just basically incinerates all the trash on the ship down into a dust, and so that's one way that they're trying to get rid of -- To prevent plastic going overboard on the ships. All the ships have those incinerators right now.

DR. LANEY: All right. Thank you.

DR. RUNDE: Thank you, Madam Chair. Thanks for the presentation, Laura. I wanted to go back to the mysterious case of the disappearing sturgeon. If I heard correctly, the Navy, or some other entity, collected some wild Atlantic sturgeon.

MS. BUSCH: It was the Maryland Department of Natural Resources, the DNR, and they had some Canadian stock that they were raising for a different project that they could no longer do, and so they were like we've got to get rid of these fish, and we're going to kill them, or do you want them, and so we took them.

DR. RUNDE: So on to Pax River, and then, after some period of time, the Navy went to get them out of the pond and they weren't there? How big are the sturgeon, and how big is the pond, and how long of a time was it between when you last saw them and they weren't there?

MS. BUSCH: So it was a pond on the golf course, and it was a fairly large pond. The sturgeon were different sizes, small to medium, and what happened was we got them right before COVID, and so they were in the pond longer than we expected them to be. We did add an aerator, because we did lose a few of them due to dissolved oxygen levels, and so we added an aerator. They had seined the pond the year before, and had about sixty of them, and then we did have -- The aerator kind of failed, and so some floated up, and so that's why we were like we've got to get these to the bigger pond, because we didn't trust our aerator any longer, and we feel that -- When we seined it, we found a couple of snapping turtles, and so we feel like maybe the snapping turtles were taking some of the smaller ones.

DR. RUNDE: A lot of bald eagles around that area, too.

MS. BUSCH: There are a lot of bald eagles around that area.

DR. RUNDE: Interesting.

MS. BUSCH: So it's probably kind of a mix of things that happened to them, and it was an entirely enclosed pond, and so they couldn't have moved anywhere else. It was entirely enclosed. They did have to put signs up of no fishing, because they found some golfers fishing, and so, yes, it was not the best time to find that they weren't there any longer, with everyone from NMFS.

DR. RUNDE: Okay. Well, thank you for the additional information on that, and I do have one more question, but I think David had his hand up. If I may, thank you.

MS. CROWE: I just want to interrupt and ask, just to be clear, and so, when you do the study on the effects of pile driving on sturgeon down the road, it's going to be a different pond?

MS. BUSCH: Yes, and the plan was always to move them to a larger pond. We needed to find a pond where they could get the equipment in to conduct pile driving, and so we were trying to figure out, you know, what pond to move it to, what pond didn't have access to the bay, that kind of thing, and so they were probably in a five to ten-acre pond, and now they're going to like a probably hundred-acre pond, and so they're going to a much larger pond. The ones that we get from Georgia are going to go straight into that pond, into the large one, tagged and dropped right into the pond, and then we'll pile drive.

MS. CROWE: That sounds like a great study, and I hope you can update us on in the future.

MS. BUSCH: Yes.

MS. CROWE: Okay. You can finish, and then we'll go to David.

DR. RUNDE: Thanks. If you could go up one slide, please. Thank you, and so I know there's a lot of shipwrecks on this map, and I think, and we have Brian in the room, and I think it's accurate to say that BOEM maintains some sort of confidential list of shipwrecks in the ocean, and are those

included in -- Whether or not they're included in this map, are they included in the protection from explosive activity?

MS. BUSCH: Yes, and all of -- We do have access to the list, when we conduct our analysis, and we know where those are, and we do analyze. A lot of them -- The bigger ones, like the Monitor, and like that one is not protected, or, I mean, not secret, but like, where the Monitor is, we don't conduct activities there, because it's so close to shore. A lot of our explosive activities are further offshore, because we want to get out of recreational fishers, and we want to get out of commercial fishers. We do have some smaller explosions that occur closer to shore, but it's one area where we always go back to, and it's an area called Whiskey 50 off of Virginia Beach. They always go back to that area, and so we know that there's nothing there.

MR. WEBB: You had mentioned the tagged whale that had crossed in front of the ships numerous times, and you were surprised that it never got hit, and is there any data that would indicate that they're becoming acclimated to ship activity and that there might be more avoidance behaviors, as a result of the frequency of ship encounters?

MS. BUSCH: That's a good question, and I know, historically, right whales are -- They were called the right whale to hunt, because they were close to shore, and they stay kind of surface a lot, and they have a lot of blubber, and they're also known to not -- Not that they're stupid, but they don't get bothered by -- They don't get spooked, and they just kind of hang out, and so I don't know if they're getting used to ship movement. That's a great question, but we are -- I mean, we are doing a lot of research on the right whales, and we're tagging down in the calving area, when we can, and Duke University is doing a lot of that work for us, and then that will also -- We're using the baleen whale project, where we're trying to figure out why the humpbacks are hanging out in Chesapeake Bay, and we've tagged some of those guys as well, and we follow those around, too.

MR. HOOKER: Laura, as always, I enjoy hearing your updates, because it reminds me of all the things that we have close ties, and, you know, I think not so much a question, but more of a comment, and like the baleen whale monitoring project, and I think that's a great example of Navy assets that BOEM is able to take advantage of, and so some of the right whale tagging around the Norfolk area, and, you know, we've been able to watch whales come around the CVOW project, and, you know, I think there's a good collaboration between the PIs that are doing that and our office. Whenever -- You know, whenever we know that -- I think it's HDR that's doing a lot of that, and they let us know that, you know -- They give us access to that whale movement data.

The other thing that I wanted to bring to your attention to is there's some stuff that we're doing on pile driving, and we're working with Woods Hole Oceanographic Institute right now and doing some pile driving right off the dock, with Aran Mooney's lab, for squid and black sea bass, and he's actually doing some scallop work too, and so feel free to reach out, and I can put you in touch with Aran, if there's any information that you want to share on squid or anything like that, and I definitely look forward to the pile driving work on sturgeon on your side, and I know, in the past, we've used some of the pile driving work that you've done, I think in the South Atlantic area as well, to support some of our analyses.

I think back to Wilson's question, and, you know, there are some models out there. I know we worked with Fish and Wildlife Service on the SCRAM model, the stochastic collision risk

assessment model, and it's based upon some density work that NCOS, NOAA's NCOS, folks did for us a while ago. That is constantly updated, and we do have -- If you look in the terms and conditions of our COP approvals, we do have, you know, requirements on using the MODIS system to record and track avian fauna that we find at the facilities, as long part of their longer-term monitoring, and so I just wanted to highlight that and the intersection that we continue to have across the different federal agencies that are active on the outer continental shelf, and I think that's it, and so not really a question, but just more of a comment.

MS. BUSCH: That reminds me of another project that we're doing, and it's in Virginia, and so it doesn't necessarily pertain to this group, but they're expanding the Chesapeake Bay bridge tunnel, and we have been doing some seal surveys, visual surveys, and we started about five years before they started doing that pile driving, just by chance, and so I've continued funding that, through the pile driving, and then I will continue funding it after the pile driving, to try to see if we can get any information on how seals respond to pile driving as well.

MR. HOOKER: Thanks. I will look forward to that one too, and we'll let you know how they feed around the facilities up in New England.

MS. CROWE: Laurent.

DR. CHERUBIN: Thank you, Madam Chair. Laura, I am just -- I am concerned, or, I mean, not really concerned, but just a question in general about the pond experiment and with the, you know, the pile driving experiment there, because it's pretty different, you know, if you have an enclosed pond, which probably is pretty shallow, I imagine, and the type of environment is acoustically very different from the natural environment where you find the fish, and so my question is how relevant do you think it is, or, you know, what is the strategy to get that system, or that experiment, as close as it could be if it was done in the natural environment, so that you can use that information in a way that makes sense?

MS. BUSCH: One of the issues, or one of the things, that they are going to do is take ABR hearing tests, to determine how the pile driving affects the fishes' hearing, and so it's not just how they may react to the pile driving, but their hearing as well, and so that's one thing that if you -- You know, at least we'll have the known level, the received levels, that they get from the pile driving, and then how that affects their hearing, and so that's one of the big things that we look at, or are interested in looking at, and, also, on a couple of them, we're going to try to get some heart monitor tags on them as well, so we can see how their heartrates change based on the pile driving, and so you're right. While it's not necessarily an open environment, and it's not exactly the same, there's really no data on sturgeon and pile driving that we're aware of, and so we're hoping to get just something out of it.

DR. CHERUBIN: If I may continue, and so we've done some experiments like that with goliath groupers, and we were trying to understand their hearing thresholds, their hearing levels, to detect the presence of unwanted underwater objects, right, but we did that in a small tank, by basically playing the sound at, you know, different thresholds, different pressure levels, and then testing the hearing directly on the fish, by putting electrodes -- You know, you place them next to the cranium, and then you can actually measure the sensitivity response of the fish, and so you don't have to have this whole set of -- You know, you could actually do in a bucket, if I may say, and get the

same results, without really affecting the fish, you know, as you would do in a pond, and so, I mean, that's just a suggestion, but it's called an auditory evoked experiment.

MS. BUSCH: Yes.

DR. CHERUBIN: Anyway, and so, like this, you don't really -- There is no damage to the fish, and it's also much cheaper, I would imagine.

MS. BUSCH: Yes, and we dropped a lot of money on this project.

DR. CHERUBIN: Yes, and we got really interesting results, and, for instance, the goliath grouper doesn't hear sounds above 400 hertz, and so everything above it dead, and it's interesting, and so you wonder actually how do they react, because, if it's not sound, it has to be something else, right, and, if you think about pressure waves, that wake has -- You know, when the amberjack moves, or whatever, when you're driving the pile, it takes a while for the wake to get to it, and so there must be something else out there that -- That we don't know about.

MS. CROWE: Thanks, Laurent. That was a great comment, and I'm glad you brought that up, and it reminds me of something that Pace mentioned yesterday, when he talked about the impacts of pile driving and the pressure wave possibly forcing sturgeon off the foraging habitats, and that may constitute a take, and so will you be measuring pressure waves at all, or --

MS. BUSCH: I don't know if they have that in the plan. I'm not quite sure.

MS. CROWE: That might be an interesting avenue too, and, again, I'm not sure how we would relate in an open environment, like a wider river or something, and that may be something to think about in the future. Does anyone else have any comments, or questions? All right. Did you want to --

MR. PUGLIESE: We can break early for lunch.

MS. CROWE: I think what we're going to do is break early for lunch, and we'll come back at 1:30, and we're going to try to shuffle a few things around for this afternoon, and so thank you, everyone, and we'll see you back at 1:30.

(Whereupon, a recess was taken.)

MS. CROWE: Okay, everyone. Welcome back. We kind of moved pretty quickly through our agenda, and so we're going to jump ahead a little bit, and Simen has agreed to give his presentation this afternoon, and so we're going to start off with him, and he's going to give us an update on the South Atlantic saltmarsh initiative.

DR. KAALSTAD: Thanks, and this was intended for tomorrow's agenda, but I don't mind doing the presentation now. I will be giving this presentation on behalf of Amanda Gobeli and Zach Greenberg with Pew, who put this presentation together and sent it to me, and so I was able to provide the presentation to you guys.

SASMI is this newly-formed -- SASMI began in May of 2021 as a collaborative effort between SERPPAS and the Pew Charitable Trusts, and there are partners from local state and federal agencies, NGOs, academics, military, cultural and community leaders, and it's a voluntary, non-regulatory partnership, and, also, it's regional, from Florida to North Carolina.

The South Atlantic coast, from North Carolina to east-central Florida, is home to a vast stretch of saltmarsh, covering over a million acres, filling and draining with saltwater as the tides ebb and flow, and the saltmarsh safeguards coastal communities and military installations from storm energy and floodwaters and serves as vital habitats for the fish and wildlife that support coastal businesses, state economies, and a unique way of life.

As valuable as saltmarshes are, they are disappearing as sea level rises, and they're at risk of drowning, and, according to NOAA, an estimated 14 to 34 percent of existing saltmarshes along the South Atlantic could be lost by 2060, due to sea level rise alone, and so they are also threatened by development pressures driven by the rapidly-growing population, and, to meet these challenges, it requires a unified effort that transcends your traditional local, state, and federal boundaries.

To that note, SASMI's goal is to enhance the long-term abundance, health, and resilience of the approximately one-million acres of saltmarshes within the South Atlantic states, to ensure no overall loss of the benefits of these wetlands provide to fish, wildlife, and people.

Why saltmarsh? Well, as you all know, saltmarshes safeguard shorelines, coastal communities, and military installations from extreme storm events and impacts such as flooding. Saltmarshes also provide important food, refuge, and nursery grounds for approximately 75 percent of the fishery species. There are some bullets here, and you can click maybe two more times.

Here is sort of the pathway to the plan, as they call it, and so the South Atlantic Saltmarsh Initiative's pathway to the protection, restoration, and integration of this great expanse of saltmarshes is what they call the SASMI plan. I did send it as a link to Roger, and as well as I put it in the chat, just for reference, if you guys want to click on it, and it's like a fifty-page document. Anyway, the action-oriented ten-year plan, which came out in May of 2023, is the culmination of over two years of work by SASMI's broad and diverse coalition. This plan was developed by a writing team, in partnership with the SASMI working group, a steering committee, and input from the broader SASMI coalition, and partnership is what made this plan possible, and so the strategies, objectives, and actions identified in the plan build upon the great work already being done by partners throughout the region. Currently, SASMI is now sort of in the implementation plan.

The SASMI plan centers on two primary strategies to achieve the goal, and the first strategy is to protect and restore the health and functions of existing saltmarshes, and so this includes -- Just a bit of intro here, and this includes objectives that minimize impacts to marsh habitat from adjacent development and sustain ecosystem and community health, support hydrologic connectivity, water flows, and sediment replenishment that is favorable to saltmarshes and to broader estuarine health, and also to expand the use of living shorelines to maintain and enhance saltmarshes and advance investment in monitoring, mapping, and research measures to protect and restore existing marshes and improve marsh function, and so, under each objective, the plan also describes specific actions that can be taken to achieve the objective. The second strategy of the two primary strategies is to conserve marsh migration corridors and to remove, or retrofit, barriers to ensure saltmarshes can shift as sea levels rise.

The second strategy includes key objectives and actions that are designed to prioritize public and private investments in conserving migration corridors where saltmarshes can thrive in the future, as sea level rises, and also to remove and avoid creating new barriers to the migration of saltmarshes by including marsh migration as a priority and planning in federal and state investments in public infrastructure, wetland restoration, and working lands.

Moving forward into implementation, now that the plan has been released, SASMI has shifted their focus to implementation. A subset of SASMI partners are currently working to design, build-out, and populate a new coordination structure to implement the plan. The structure will promote high-level coordination across federal and state agencies, coordination between those agencies and other SASMI partners, and it could include focused state implementation teams in Florida, Georgia, South Carolina, and North Carolina.

Implementing the plan, over the next ten years, will, obviously, require a significant amount of funding. Fortunately, the release of the plan coincides with the timing of historic levels of funding, and that, obviously, presents a great opportunity, and so SASMI has applied for some of the climate resilience funding that's available, and I believe they are also submitting a proposal for the transformational habitat restoration that is coming up November 17, I believe.

SASMI is taking advantage of these opportunities, through partnerships on landscape-scale proposals that weave together projects from multiple partners across the SASMI geography. They were recently invited to submit a full proposal to the NFWF NCRF call for proposals, and are pursuing other NOAA funding opportunities as well, like the ones that I mentioned.

Again, I'm sort of speaking on behalf of the SASMI team. I'm representing the Atlantic Coastal Fish Habitat Partnership, who is one of several members, but I am open to any questions, if you guys have any, and, obviously, the overall theme is here, you know, the long-term focus on marsh restoration and fish habitats, in the context of climate change and the species that utilize those habitats and how they will adapt, and how management strategies may need to adapt accordingly.

MS. CROWE: Thank you, Simen. That was a great presentation. Does anyone have any questions for Simen, or comments on his presentation? Roger, go ahead.

MR. PUGLIESE: Just a quick question, and I'm not sure if you know, but is there a repository for what information of the entire system, like the entire distribution of saltmarsh, by state, and is that someplace that is compiling that, or presenting it, or is it each individual partner is kind of pulling that together and then coming up with some of these different strategies?

DR. KAALSTAD: I believe it's more the latter. If I understand correctly, they're sort of structured similarly to the Atlantic Coastal Fish Habitat Partnership, in that it is a network of people, from various agencies and other organizations, that sort of combine their resources and sort of have now come up with this plan, based on their information, and, if you go to the website, there may or may not be a little bit more insight to the data they're using, and like if they've compiled it into one large database or if it is just a compilation of separate efforts from the partners, and I'm not sure, but I do think it's the latter.

MS. DEATON: I was just going to add that I know they had a dedicated GIS person who combined data layers, and so I think there might be a wetlands state-wide, I mean Southeast-wide, project, but I know, at this point, each state is working on like their own state wetland plan, and that's so there is somebody -- Some group is sort of in charge. For us, the Coastal Federation is sort of, slash Pew, is heading up development of a North Carolina wetland restoration and protection plan, and so I think the other states are doing the same.

MR. PUGLIESE: I went ahead and pulled up the site, and, yes, it has the maps coming, and so that will be compiled probably from your information that's fed into the system.

MS. CROWE: There's also a South Carolina Marsh Stakeholder Collaborative that I think is similar.

DR. KAALSTAD: I had a brief conversation with Amanda recently, just to catch up with Zach at Pew, given that he's also a steering committee member for the partnership that I'm the coordinator for, and that's how I was able to get these slides, since we've basically been in touch, and I was like, hey, do you have sort of an introductory to the plan, and she gave me these, but, from our short conversation, yes, they are kind of on the state implementation side, and so, like you said, I think each state is sort of combining heads and managing it independently.

MR. PUGLIESE: I think one of the things that I wanted to just highlight, and I think you've done it with this, is the importance of this effort, because of the dependence of council-managed species, prey they depend on, et cetera, and I think this is, you know, a really important thing, and that's one of the reasons that I asked kind of about the bigger picture, because really understanding what is supporting those systems is going to be important, especially as these systems are fluid and changing.

Are we going to still see the production for estuarine-dependent species, like gag or shrimp or whatever into the future, and so the importance of doing this now, I think, again, as another big one, is really critical, and it's good to see that states are directly involved, and what would be great is to see some combination, to be able to see, in combination, how we are -- Maybe that's something that, ultimately, as this evolves -- That could be part of your annual report, to see where we are, where we stand, on those shifts, and maybe opportunities to connect with some of the other efforts, because I see this, and I'm wondering to what degree could you look at the information say in the SECAS system that you can drop all the way down to a watershed and then look at that relative to what's being done in the state level, and so there's a lot of opportunities, and the biggest thing is if you all feel this is important for the EFH considerations, and I think that was one of the reason that this was brought forward, and maybe any comment on that, to what people see. I think what you said is that the investments at the state levels are already there.

MS. CROWE: Go ahead, Anne.

MS. DEATON: I was just going to add, and so one thing -- I attended one of the North Carolina meetings, and what they've done is taken our wetland maps, and they've looked at sea level rise projections from the NOAA sea level rise thing, and, at the stakeholder meeting, everybody decided how far out to look, and which scenario, because you know a low, medium, or high, and so they went medium or low, thirty years out, and then they did a GIS exercise, where it showed what wetlands would be lost, which ones would be able to migrate inland, assuming, you know,

they could just migrate inland, but what it did show is like, in the southern half of North Carolina, most of those wetlands -- The saltmarsh will drown, because either they're an inland, and there is no uplands to migrate to or the slope on the mainland-type side was too steep for them to keep up, but, in the north half, the elevation is so low and gradual, that they will be able to migrate inland, if allowed, and so we could actually get a gain in saltmarsh, between the migration and the saltwater increase, but a big loss in the south, and so it could definitely affect EFH species.

MS. CROWE: Okay. Thanks, Anne. Does anyone else have any comments or thoughts about this and EFH considerations? Wilson.

DR. LANEY: Thank you, Madam Chair. Yes, it occurs to me to ask Simen, and/or Anne and Casey, since I'm sure they know a whole lot more about this than I do, but, in association with looking at the potential for landward migration, is there any effort ongoing to assess saltmarsh condition throughout the range, because I know there have been some papers, and it was quite a few years ago now, about Littorina eating marsh grass, or causing impacts to marsh grass, and so I wonder, given that there are other factors, aside from rising sea level, that affect them, if it would be useful, for example, since SASMI has come together as a partnership, to try and undertake any sort of an assessment of saltmarsh health at the same time they're trying to document the extent and whether or not migration is possible.

MS. DEATON: I don't know. Maybe Simen does.

DR. KAALSTAD: My answer is more or less the same. I am not entirely sure, but, again, like their second of two strategies is to, you know, consider barriers, to ensure that saltmarshes can shift for sea level rise, and so, given sort of the focus on climate change, I want to imagine that, later down the line, that there is probably some initiative that would go towards assessing condition. Again, a lot of this is sort of funding dependent, and so I think, right now, it's just a matter of coming up with -- Well, they have, obviously, come up with a plan and have now sort of developed enough to where they can start to implement, at least based on the funding that they have.

MR. PUGLIESE: Simen, one thing I did think about is that, you know, as we go down the road with all these -- So many times, we're looking at one individual, and we started talking about the one individual, aspect of what's going on. What I wonder is what the consideration is going to be as we see increased -- These big increased rain events, and flow increases, and how that factors -- So what you end up having is multiple, the sea level rise plus increased flow events, and that may change the dynamics of how big of an area you want to look at, or how it affects the salinity to actually support those systems, and so I think that's something we need to keep in mind as these are moving forward, is to make sure that you're always thinking about that secondary type of connection with other aspects, because I think that's really what is going to catch us, is the multiple effects.

DR. KAALSTAD: Right, and I think, sort of considering the difference in the intertidal habitats between just Florida and North Carolina -- I mean, you're going to have different levels of implementation, if you consider mangroves versus non-mangroves in the North Carolina area, and so like, in Florida, they're going to have to have a different strategy to sort of tackle the fact that mangroves are the last of the front line. As the sea levels rise, you know, all of your marsh banks are going to be largely, you know, complex, woody root systems, with marsh grasses sort of further

back, or in smaller pockets, versus in North Carolina, where -- You know, not quite yet, but mangroves aren't there, but maybe. It's very dynamic, you know, if you consider the east coast of Florida all the way up to North Carolina.

MS. CROWE: Paula, did you have a comment?

MS. KEENER: Yes. Thank you, and, also, of course, vessel traffic, small craft vessel traffic, how frequent that is within a particular area, and that's also a huge consideration, regardless of no-wake zones.

DR. KAALSTAD: Absolutely.

MS. CROWE: Great. Thank you, Simen. We appreciate you making yourself available this afternoon, and so, next up, we are going to move to Dale Ketchum, and he's going to give us a presentation on space operations off of east Florida.

MR. KETCHUM: I appreciate the opportunity, because I don't know how much you guys get space stuff, but it is -- As our industry is growing ever more rapidly, and our launch cadence is growing, the impact -- We deal increasingly with the commercial fishing industry, because what we're doing is impacting them, either through restricting areas where they can go, because of safety concerns if we have a bad day and a rocket fails and falls into the ocean, and we've got to -- The Coast Guard makes sure that there are not people in that area, or the fact that we have -- Occasionally, there is space-based debris, or, if there's a failure, there is space debris that falls into the ocean, and right off the coast of the Cape is the Oculina Reef, which is a key -- It's something that we want to take care of.

This industry has been growing a long time, and I will go through the slide deck, which is actually more geared to a chamber of commerce than -- You guys are much more academic, and so I won't pretend to -- I won't bore you with our usual business development sales pitch, and I'm also assuming that you guys are probably smarter than I am on how space-based assets are better serving your scientific and research needs, and so what I will do is just who the hell am I?

Space Florida is -- The best way to understand us is we are a -- We're a special district of the State of Florida. The best way to think of us is like an airport, or a seaport, authority, but we're a spaceport authority, but, uniquely, we have jurisdiction throughout the entire state, and so we have work from Pensacola to Miami to Jacksonville, and most of our activity is at the Cape, blah, blah, blah, chamber of commerce stuff.

We work very closely, again, and that particular area of the Cape, of the space coast, is where most of our activity is concerned, but we have a space port at Cecil Field in Jacksonville, and we're looking at expanding that also to Homestead and Tyndall Air Force Base in the Panhandle, although that's not likely to result in a lot of launches anytime real soon.

This gets to one of the big problems we have, which is interference and deconflicting of both sea space and air space for aviation and maritime activity, because, ten years ago, we had eight launches a year. Three years ago, we were at thirty-seven, and last year was fifty-seven. This year, it's going to be close to ninety, and we'll be at a couple hundred launches a year -- We'll be probably a hundred launches a year next year, and growing to a hell of a lot, and so managing the

air space, and the sea space, is an increasing challenge. It's a good problem to have, but it's a serious problem, and we're working our way through it.

That's an example of airspace restrictions, blah, blah, blah, and you can see that there is a hell of a lot of aircraft, and that's our biggest issue, is aviation deconfliction, because the airlines are very powerful, and have a lot of money and a big voice in Washington, as opposed to commercial fishing, who has a modest voice, shall we say, but aviation -- But, again, we're working our way through it.

The neat -- Just to give you an example of what we're dealing with, ten years ago, the vast majority of launches were NASA or military launches, and everybody is quite prepared to get out of the way for exploration or national security issues. Now we have -- We're asking United, Southwest, and Delta to burden their passengers with rerouting and lowering their profit margins so that Elon Musk and Jeff Bezos can make more money, and that's a challenge, but these are -- Like I said, these are -- It's a good problem to have, because the nation needs a strong, robust space industry, for a host of reasons, and we're working our way through that, managing closely with the FAA, the Coast Guard, and others to get done the job, but it's a big issue.

That's an example of a -- You can see that restricted area during a Delta launch, and that's a real problem for maritime activity, both commercial shipping, fishing, and recreational, and so there are significant problems, but we're working our way through them, and, so far, we've managed to get through it pretty well, but, with 300 launches a year, that problem is going to get bigger.

Again, this is just an example of how many more launches are going to be coming, and the vast -- Basically, now, about 85 percent of all the launches at the Cape are commercial, and the military, obviously, has a huge -- This is Space Force, and they are growing as we increase human activity in space with manufacturing, tourism, mining, energy production, and they're going to be increasingly involved in space, the same way the Navy is on the sea space, to keep commerce going, and our primary focus is to make Florida the primary port of entry for economic activity, and human activity, in the solar system, not unlike what London was to the British empire, two centuries ago, and so I think our primary purpose -- I got through that slide deck, just because I wanted to get through it, but I think the key thing, for your interests, is we are dealing with a number of issues, both with trying to maintain --

I had asked our safety and environmental guy if, to our knowledge, the FAA gives any consideration when they're licensing a commercial launch, to whether or not say -- SpaceX doesn't use them, but ULA uses those small, solid rocket boosters that they attach, if they need additional lift, and others will do that as well, and do they give any consideration to whether or not that's falling on the reef, and, to be honest with you, I don't know. Over the years, I'm sure, given the thousands of launches off the Cape, many of them not successfully, and, fortunately, that was more in the past, I'm sure there is debris that has hit that reef, which is not a good thing, and we have a responsibility, as a growing commercial industry, to be attentive to that, but I honestly do not know if there's even any regulatory awareness to that, and so that's something we may consider looking at, and I would certainly -- I would bring it to your attention, because that's something that you guys should be aware of as well.

Additionally, we're also dealing with the growth of the commercial manufacturing. Processing is growing very big on Cape Canaveral. The Cape Canaveral Space Port at large, which is both

NASA and the Space Force base, we're looking at adding an additional probably 20,000 jobs out there within the next fifteen years, and that is an issue for both wastewater, and where that's going, but equally -- As it stands right now, we can build large facilities out there, and the existing regulations have issues relative to freshwater runoff into the Indian River Lagoon, which, you know, as most of you might be familiar with the Indian River Lagoon, and it's a brackish estuary, and freshwater is, in many ways, a pollutant in a brackish estuary, and we have big problems at the Indian River Lagoon.

There's a host of issues that we're going to need to continue to work through, as good stewards, and we deal regularly with the environmental community there, the primary focus being the Indian River Lagoon, and so our space activity is -- As we get bigger, and our activity grows, which is a national imperative, a national security imperative, economic competitiveness, all that stuff, we have a responsibility to be good stewards, one because we're human beings and we should do that anyway, but, additionally, our job is -- Our charter, as a space port, is to grow the industry.

The biggest problem we have there, in growing our industry, and we've been very successful, but our biggest problem is, not unlike the rest of the country, but it's particularly acute because of the success we've had, is recruiting the talent, and retaining the talent, for SpaceX, Blue Origin, Lockheed-Boeing, OneWeb, all these other high-tech industries that are growing and vibrant, and people won't come and stay in a community to work, even if the work is really cool, if the river is a cesspool.

That's a simple fundamental, and that's a business development issue for us. If we're going to recruit the kind of talent we need now, and for a generation to come, we need a quality of life that includes a great ocean, and a great river, and so, like I said, we've got these issues to work through, and we're doing our best. We get yelled at a lot, but that's part of the process.

When we want to do something new in development, we get a lot of environmental pushback, which is exactly what should happen, and so we're -- We work through that, to try to come up with a win-win and achieve mitigation over and above what would be a minimal requirement. That's much easier said than done, but that's our challenge, and, given the fact that I know you all are looking for a party tonight, I will shut up on that, and I'm happy to answer any questions, if you have any.

DR. RUNDE: Thanks, Dale, for the presentation. It's super interesting, and can you say, with any degree of certainty, what percentage of space-related debris that falls in the U.S. Atlantic Ocean is recovered?

MR. KETCHUM: That's a good question that I don't know the answer to, and somebody had asked me, when I pitched to the St. Augustine -- In earlier June, I pitched to the South Atlantic Marine Fisheries, and the question was, you know, how much have you dumped in the ocean, and, to be honest with you, I have no idea. Over the decades, I'm sure it's a lot. However, it's also the case that there's a lot of debris in the ocean anyway. We have -- Sometimes we'll get a fisherman who will get exercise because something fouled his net, and he had to cut it out, and it ruined the extruder devices, and, on occasion, that is debris from space, but sometimes you will look at a picture and go, I don't think that's one of ours, but I will be honest with you that, most of the time, if it's space-related, it's going to be of a material, and a composite, or a metal, that looks like it's a part of the space program.

I will be honest with you that I do not know -- No one has had the charter of collecting that kind of data. It would be speculation, but, fortunately, for our industry, the trend is moving, like SpaceX, and they try not to throw -- They recover the boosters, and now everybody is going, why the hell didn't we do that a long time ago, but there's another company, Stoke Space, and it's a smaller company that just got a license for a launch pad at the Cape, and they're focused on recovering the second stage as well, because, right now, SpaceX -- They try to recover the fairings and, obviously, the first stage, but the second stage usually is deorbited into the middle of the Pacific, but they're also -- I know Blue Origin is also -- At the end of the day, they're trying to get to reusing everything, because that stuff is expensive, and why the hell are you throwing it away, when you can -- We now have the capability to reuse it, and so the trend is away from that, but, to answer your question, I have no idea. I wish I did, but I don't.

MS. CROWE: Myra, go ahead.

MS. BROUWER: Thank you. I just wanted to give the AP a little bit more background of why we've invited Dale to present to you all today. The council started talking about this, and I believe it may have been in March of this year, and I can't quite remember, and we brought Dale to the June council meeting, at the request of the council, and then we've been requesting, from the species advisory panels, and the council basically said let's go to all of our APs and ask them, you know, how -- Are you being affected, you know, in your particular fishery, or, you know, whatever you guys do, by some of these activities, and so this has been a topic at the council table this year, and they asked us, you know, to keep everybody informed.

Then they subsequently also said, you know -- In the course of all of those discussions, it came out that the U.S. Coast Guard, as Dale mentioned, does have, hopefully, some more information to answer questions like Brendan just posed, and so we did a Freedom of Information Act request, and we just submitted that to the Coast Guard like a month ago, and so we'll see where that goes. It was a very broad request, and basically we just said, you know, can you quantify, you know, the amount of activity, or the number of activities, that may have impacted fisheries in any way over the last ten years, and so it's really broad, and we don't know what we're going to get, but that's kind of where we are. Thanks.

MS. CROWE: Thanks, Myra. I think Wilson had his hand up first.

DR. LANEY: Thank you, Madam Chairman, and thank you, Dale, for the presentation, and thank you, Myra, for that explanation of why the council got interested in it. My question is a little different, I think, and I'm certainly interested in the aspect of the debris deposition in the ocean, and other parts of our landscape aspect, but, also, I guess I've been reading a little bit lately about -- The best way to characterize it maybe is orbital limitations, and there's an awful lot of stuff that's up there orbiting the Earth, and have you all, Dale, looked into -- Well, a two-part question, I guess. A, is there any effort to try and retrieve any of that stuff up there, to like maybe create more room, more space, for additional launches and orbiting things, and do you all worry at all about -- I mean, the more stuff that gets up there, does that adversely impact your ability to keep pushing, you know, for a space industry in the future?

MR. KETCHUM: You're talking about space debris, which is a major issue for our industry, and everybody else, and I think there's -- You now, there are tens of thousands of pieces of material

up there, but the problem is there are hundreds of thousands of pieces that pose a risk to the assets that are existing there, because even a paint chip, at 19,000 miles an hour, is a problem, but it's also the case that, even though there's all that material up there, and there's no other way to say this, but there's still a hell of a lot of space in space, and the plan is to go -- Right now, we've got about 10,000 objects, ballpark, and we're going to be at 50,000 in ten years, just because the demand for broadband capability, and internet access, around the world is such that it's insatiable, and so, even if Elon Musk gets his, you know, tens of thousands of Starlink satellites up there, there's still going to be a demand for -- Jeff Bezos has got a Kuiper. His Kuiper system is equivalent to Musk's Starlink, and it's going to be many tens of thousands, and there's a whole bunch of other people who are trying to provide the same capability.

Whether or not -- But it is also the case that they're clearly -- Even though there's still a hell of a lot of space up there, obviously there's a limit, and the problem you have is, if events start -- The cascading event, and those of you who are familiar with watching the movie "Gravity", where something broke apart, and then that hits other things, which break apart even more, and is that a risk? Yes. Is it likely? No, but, to answer your question, what we're doing, in the great American tradition, is we're trying to figure out how to incentivize companies to go up there and clean it up.

Now, one of the things we're doing locally, because, you know, there's a limit to what the U.S. can do, and we're putting up most of it, but we're not the only people at all, and we can't control them, but the FAA -- Now you can't get a license to put something in orbit unless you can demonstrate your ability to deorbit it, and, most of that stuff, the plan is -- Even the Space Station is going to get deorbited, and that's a really big -- That is big enough to come back and do some damage, but now we're going to spend a billion dollars to build a piece of hardware that will be able to make sure that thing comes back in the middle of the Pacific Ocean, because it seems like the Pacific Ocean is always the dumping ground, but, again, that's because it's so damn big, but, eventually, you know, should we be doing that?

I personally think we ought to be taking the stuff and putting salvage yards up there in space, because all that stuff just burns up, which is going to be a future environmental study on, if you're having tens of thousands of satellites burning up in the upper atmosphere, made up of all sorts of metals and toxins and composites, what's the environmental impact of that? We haven't even really begun to scratch the surface, and it's starting to surface as an issue that we need to look at, because, in the upper atmosphere, things are a lot different. Even water vapor, at a real high altitude, is not a good thing, and so aluminum and titanium and composites, who the hell -- You know, nobody has ever looked at that.

But, to answer your question, we are doing what we know works, is figuring out how to incentivize companies, and there are companies. There's a Japanese company that's supposed to fly, I think this year, with a pilot project for extracting debris from space, and so, if we can -- It's basically in everybody's interest to come up with a way to solve that problem. Do I know how it's going to be solved? No. I am hopeful that it is, or my industry has got a real problem, but that's the best I can give you.

DR. LANEY: A follow-up, Madam Chair, and so thanks, Dale. That's very interesting, and you touched on an answer to my next question, which was is it really true that what goes up must come down, and it sounds like most of it -- Does most of it eventually come down, and burn up, or are

there things that are just up there permanently and would stay there unless we made some effort to retrieve it?

MR. KETCHUM: As a general rule, eventually things will come down, unless -- You can put them in what's called a graveyard orbit, which is way up there, because the low-Earth-orbit satellites are at about a hundred miles up there, 100 to 200 miles, and then you have geosynchronous orbit, which is where you put it where it's going to be right over the same part of the Earth all the time, and that's at -- Crap. I should know. I'm going to embarrass myself, but 22,000 to 30,000 miles up there, but you can also put it in like a Lagrange point, which would be a point where the gravitational pull of the moon and the Earth is balanced out, and, if you put it there, ostensibly it's going to stay indefinitely. It just strikes me as burning this stuff up seems like a foolish thing to do, but it's expensive to push it up even farther, because you need fuel to get even farther out of Earth's gravity well.

DR. LANEY: Thank you.

MS. CROWE: Steve, go ahead.

MR. MILLER: Thank you. Thanks for your presentation. I have a question. Basically, I want to know -- I agree with your statement that people don't want to come live on a sewer, and they don't want to live -- Unfortunately, I think the river has become somewhat of a sewer, because so many people have already decided to live on it.

A lot of the problems of the Indian River Lagoon are -- I mean, we have nutrient enrichment, and one of the biggest problems is septic tank freshwater diversion, bulkheads, and there's a lot, but I see here billions and billions of dollars going into a space program, and is there any effort for this program to make significant contributions to restoration activity to the lagoon that do not directly have to do with operation of the space port, but that actually benefit the lagoon?

MR. KETCHUM: The answer to that question is no. Now, should there? As someone who has been there his entire life, I would like to see that, but dictating to an industry, and a business, that you're going to do something differently -- That's a difficult question, because you could apply that to shouldn't you do something about homelessness, and you get into a whole nasty scenario. Now, would I like to see our capitalist system better address those issues? Yes, but I think you're getting almost into a philosophical question. Would I like to see that? Yes. Do I think that's likely in the short-run? No. I wish it would, but that's the best honest answer that I could give you.

MR. MILLER: Yes, but the infrastructure to bring in 20,000 new people to live in there is going to put a stressor on the lagoon, and, I mean, I understand, but --

MR. KETCHUM: At least from our perspective, one of the things that Space Florida is working on is, right now, the wastewater treatment facility out there is getting the job done, and it's adequate, but it's really messed up, because NASA, which is inland, ships all of its waste east to the beach, where the Space Force manages the wastewater treatment plan, which is kind of foolish, and it's kind of messed up, because too much of the water that's going into that wastewater plant is non-nutrient water, which means the plant is not working efficiently, and it's coming from air conditioning and deluge and things of that nature.

We are working closely with the state, and others, about developing a wastewater treatment plant that will move back over onto the mainland and support parts of the mainland that desperately need it, to get septic tanks removed, or off of septic tanks, as well as accommodate all that future growth, and so there are things that are happening, but that's -- You know, are we doing everything that we humanly could, and should, be done? No. I wish we were.

MS. CROWE: Let's go to Trish and then Laurent.

MS. MURPHEY: Thank you. I just wanted to kind of follow-up, behind Myra, what the council was looking for from this AP, and we're really kind of looking for your thoughts, and concerns, of things like what space debris -- What impacts would it have on EFH, or habitat, in general, and, you know, water quality, and other concerns that the council has, and has heard from other fishers, is the closure times, and how that impacts fisheries and fishing, and so what we're interested in, to hear from you, is what are your concerns on space debris and habitat and anything else like that, and, I mean, I think we also discussed mitigation for losses and stuff too at the council meeting, but I'm just trying to see what your feelings, as experts on habitat, on space debris, and so that's all, and I just wanted to kind of help clarify what Myra was talking on.

MR. KETCHUM: Yes, and I would state that -- I don't know how many of you know Laurilee Thompson, from our neck of the woods, but, as I pointed out at the council meeting in June, she's got my cellphone number, and she's regularly flogging the hell out of me, when there are issues that are adversely impacting commercial fishing in particular, but she's also got a big heart for the lagoon, and so she yells at me over that as well.

DR. CHERUBIN: Hi, Dale. I live also on the treasure coast, and my question has to do with environmental impact, and I know that NASA has a big environmental program to monitor the impact of the activities on the ecosystem, offshore and nearshore, and in the lagoon as well. Since there is that focus for the huge increase in use, is there also a focus on a plan to increase the assessment of the environmental impact on the environment, like NASA is doing? My question is what is NASA doing with all that increase in all this sort of private industry enterprise over there, and do you have any role in, you know, assessing what is being done?

MR. KETCHUM: That's a fair question, and I think the challenge that I see, and this may not be an official Space Florida perspective, but the challenge that I see is NASA is limited, and our federal Space Force partners as well, but they are only holding industries that's developing on their property to the requirements that the state imposes on them for development, and the federal government is -- Space Force is doing the same, and so they can't really impose additional constraints on industry that wouldn't apply to any other federal development, but, yet, most of the activity is commercial, and they're sort of limited in being focused on their mission, as opposed to the commercial side.

The FAA manages most of the commercial activity, but the FAA's regulatory responsibility is really more safety, as opposed to environmental, and so I don't want to say that there's a gap in who is really responsible for this, because I don't want to be on the record saying that we need more regulation of my industry, or other people will be yelling at me, but, to answer your question of is there a corresponding focus, and I would say probably not. Are they trying? Yes, but is there

a limit? Are they regulatorily and institutionally bound to keep up? I would say no, if that makes sense.

DR. CHERUBIN: Yes. that's makes sense, and so you're saying that there are monitoring programs, there are environmental assessments, and all of that is basically business as usual, and it doesn't account for, you know, estimation of now, if you have 100 launches for a year, what is the increase in, you know, acoustic disturbances to the environment, and so that could be coastal, or that could be all the animals that are susceptible to those changes, and so there is nothing like that happening.

MR. KETCHUM: All of that would have been captured in the initial EISs and environmental updates that NASA and Space Force do. They are doing it. They are doing it by the book, I guess is the best answer I can give you, and now, whether the book is adequate to meeting aspirational goals for the environment, that's another question. Does that make sense? I mean, that's the best answer I can give you.

DR. CHERUBIN: Yes, that makes sense, which means that we need to follow-up on that and all those impacts, because then it's just like the Navy. They have a plan of operations, and they follow-up with a response assessment to those plans, and then they write a report.

MR. KETCHUM: Right.

DR. CHERUBIN: So I would imagine NASA would be doing the same thing, or someone has to be doing the same thing, right?

MR. KETCHUM: I think they -- I give them credit, and they try, as do our friends at the Space Force, but, you know, they have their own chains of command, and their obligations, but then the obligation not to exceed your obligation, because you will get pushback, and that sounded like babble, but I think you know what I mean. There's a limit to what they -- They're doing it the way they're instructed to do it, but they get themselves into trouble if you go beyond your instructions.

MS. CROWE: Okay. It looks like we have a question online, and so, Simen, do you want to go ahead and ask your question?

DR. KAALSTAD: Yes, sure. I was just curious if you were able to comment on if space operations in Florida, or other coastal space ports, for example, would maybe change, or amplify, in response to the recent decision by the Supreme Court to deregulate wetlands, and I guess in the context of like couldn't that lead to less accountability, or discourage good stewardship, in the context of debris and contaminants, if they're not legally obliged?

MR. KETCHUM: I will be honest with you. I think, from our perspective, we're guided in -- Any new development at the Cape, or anywhere in Florida, is going to be held to the wetland requirements that anybody else is going to be held to, and that's strictly -- I don't think there are any wetland impacts from launch activity, and it's more if we're building a new factory somewhere, and then it's just a new development. I don't believe there is anything new that -- The actual launch and recovery activity, to my knowledge, hasn't had any wetlands impact, and I may be wrong, but I don't think I am.

DR. KAALSTAD: Okay. Thank you.

MS. HOWINGTON: So you've said that you aren't sure exactly the amount of debris that has been put into the ocean, but is there any plan, or is anyone even talking about, what the materials could be at the bottom of the ocean, what the impact could be long-term for those sitting at the bottom of the ocean? Like especially things that have been deorbited, and could they have fuel that's leaking out, or anything like that, that could be potentially causing long-term detrimental effects to the environment, and, if you know that a shuttle, or a satellite, has been created by these materials, that you know can leak into the ocean and cause problems, would there be a plan to try and pull it out? Like is there any kind of follow-up of, hey, we found this, and it's a problem, and it belongs to you, and get it out?

MR. KETCHUM: I think, in the short -- In the past -- I mean, most of the debris that's there was put there a long time ago, when we weren't paying any attention and didn't care. Now, is there -- Might there -- I'm pretty sure, given the thousands of launches, and many, many hundreds that didn't make it, and I'm sure there was fuel in it. Nowadays, is there -- I think it's pretty clearly monitored, and the likelihood of there being fuel would be if we have an accident and a vehicle blows up, but then the only fuel that would be a concern would be your hypergolic, which are really nasty things, but there's not usually a lot of that on there, and they're just for on-orbit activities.

The rest of it is just either hydrogen, or soon to be methane, and, right now, it's just a refined kerosene, and so it just floats to the surface, and I don't want to say that it's not an impact, and it is, but it's like if you go out on the water any July 4th, and there's usually a sheen. You know, with all the boats, there is usually a sheen of petroleum on there anyway, but I think, if we -- Now, it is a given that there will be more nuclear payload launches, because we are -- We've developed the capability now to have safer nuclear reactors, particularly which becomes attractive, and required, if you're going -- If you're flying away from the sun. If you're going to Jupiter, solar doesn't really work, but those launches also get so much attention, and, you know, the safety built into them is such that -- You know, I don't want to say don't worry, because it's nuclear, but that would be really be the -- I think, if there was an issue, the eyes on it, and the regulatory function, and the people concerned about it -- If there was a problem, it would be dealt with.

With the commercial sector, you don't get a license from the FAA unless you can demonstrate that you've got at least a half-a-billion-dollars' worth of insurance, and so there's money available to address a problem, if there is one, and so the FAA -- Their issues are safety, but it's also a -- It's a pain to get an FAA license, for a reason. I hope that answers your question.

MS. CROWE: David, did you have a question?

MR. WHITAKER: This will be a stretch, a little bit, but I was down at Cape Canaveral in 1987, tagging white shrimp, and we watched a launch, and, at that time, they told everybody that, from this latitude to that latitude, out of the ocean, or out of that zone, and so, anyhow, it occurs to me, and, again, this is going to be a stretch, that, as we're seeing more and more launches, and 200 you said, or perhaps more, and it gets to the point where that safe zone, or at least out to three miles, or however they're doing it down there, becomes a closed area for shrimping, essentially, and why that's important is all the large shrimp, in the Carolinas and Georgia, migrate to Florida, and they overwinter off of Cape Canaveral.

I have tried, for years, after winter freezes, to convince the Florida folks to close that fishery and let those shrimp come back, but they don't want to talk to me, and so this might be a positive for the shrimp, to have that area almost completely closed, and we get those shrimp coming back, and that's --

MR. KETCHUM: Well, the challenge is that, as the -- It's like if you have a new vehicle, and the FAA is pretty good about calculating that, all right, at any point during the launch, if there's an explosion, what the debris field will look like, and that's the area they close it, but it's also the case that like, for the FAA, when they create a hole in the sky for a launch, and now you've also got to accommodate the landing, which is really cool, if you've never -- You've got to come down and watch a vehicle landing, and that's even cooler than a launch, but it's like anything else.

As the hardware, and the systems, mature, those holes in the sky get smaller, and both the FAA and the Coast Guard are much better now at the duration, because it used to be like, with the shuttle, they would close it for a day, which is really dumb, you know, and you don't need to do that. You know exactly how long the safety requirements are, and so there's a lot of progress being made, and, as the vehicles mature -- Because eventually they're going to get to the point of where, you know, you can fly a fully-loaded, fully-fueled 747 over an elementary school, and nobody thinks about it, because -- There's not a zero chance that there's going to be an accident, and there is a chance, but it's manageable.

Eventually we'll get that way with space hardware, but the amount of times that 747 has gone through rigorous tests, and flight training, and so there's a way that we're going to be able to accomplish that, but we're not anywhere near that now, and I hope that answered your question, or did I go down a bunny hole?

MR. WHITAKER: Most of it.

MR. KETCHUM: Okay.

MS. CROWE: Casey, go ahead.

MS. KNIGHT: I just had a follow-up question to Kathleen's. You know, along with the fuel, are there other things that, like coatings, fire retardants, like other substances that we would need to be concerned about, you know, especially having lived in Wilmington for multiple years, and, you know, I think of GenX, and some of these emergent chemicals, that we don't really know the impacts of, once they get into a water source, and so are there concerns about those, and, if not, or if it's unknown, how would we able to maybe get like a list of the materials that have come down in the past, that have entered the water, anything like -- Or what is the known substances of the space debris?

MR. KETCHUM: Again, I think that gets to -- I don't know that people were -- I don't know that anybody had the responsibility to collect that data. Fortunately, there's not that much going into the ocean nowadays, and the issue will be -- At least from my perspective, I think the bigger issue will be if there's an accident, if something blows up, because, ultimately, most of this stuff goes into the deeper part of the Atlantic, which is not to say that's inconsequential. Somebody cares,

but, to answer your question of who would be responsible for knowing what's on that vehicle, and on that payload, that would be the FAA.

MS. KNIGHT: Just a quick follow-up to that too, and, you know, I'm just thinking about as these things, you know, do enter the water, say in the deep Atlantic or something like that, has there been any evidence of, you know, animals ingesting any of these materials either, you know, like the microplastics or anything like that? You know, I could imagine that a nice, shiny object in the bottom of the Atlantic somewhere would look kind of tasty to somebody.

MR. KETCHUM: I have no idea. Has anybody -- I don't think anybody is tasked with doing that, and so, you know, has there been research done, because some professor said, that would be pretty interesting, and got a budget for it, and I have no idea.

MS. CROWE: Anne.

MS. DEATON: I think that's the problem, is that you don't know, and that's not how it works with environmental impacts, usually. If there's an environmental impact, potentially, and you need to get a permit, say, you have to do an EIS, or an EA, and you write that all down, and you quantify it. We don't know how much marine debris, or space debris, is going into the ocean, and that's like step one to knowing if it is a significant problem, and so we need to have some kind of quantification, and that's on the applicant.

The applicant is the person that's doing it, and so I think that it's an anomaly that they don't have to do anything like that, and I don't know what the materials are that are on a rocket, whatever, and I don't know if there's plastics components, but plastics are pretty much in everything, and there have been a lot of studies showing microplastics in the majority of fish, of all different trophic levels, and it's amazing, and so, when you also say, well, space, it's really big, and there's a lot of space, and they used to say that about the ocean, and they put their wastewater in it, raw, and so I'm getting kind of a little upset here, because plastics -- We don't know what the quantity is, and we don't know what the shape is, and so does it cause entanglement?

Hydrocarbons could be in so many of those products, and then there's the greenhouse gas emissions. You mentioned methane, but look at that in one launch, and so is it necessary, when we're trying to reduce our greenhouse gas emissions? I'm also just wondering what are all those -- Who is going up fifty times a year? Do you know? Is it two people?

MR. KETCHUM: No, and the vast majority of these launches are commercial payloads, and most of them are the Starlink satellites for SpaceX to provide internet and communications capabilities throughout the -- Across the planet, because there's just an insatiable demand for bandwidth, everywhere, and that's where most of them are going.

I think the challenge, relative to your -- The challenge is that an EIS for -- The demands, and the requirements, for EISs are for impacts on -- Of a federal agency in America. Most of this stuff, and SpaceX is -- Where SpaceX launches, from either NASA or the Space Force base, because it has two launch sites, they did their EIS a long time ago for those activities. Most of this stuff is falling outside of the United States, and so I don't know that there's a requirement to collect data on stuff that's falling outside of the United States.

Now, should there be? I'm not going to argue that it would be good to know that, but I think you would need to get Congress to designate that, going forward, this will happen, and most of the stuff that's out there has been there for decades and decades. The bulk of the actual volume of what's been dumped out there, because we don't dump that much out there anymore, in comparison to a lot of other industries, and I would say ours is negligible, but negligible is still significant if you're the creature on who that rocket just landed.

MS. HOWINGTON: I think you just hit on what part of my question was, is that you're saying that it has decreased in recent times, and this is mostly old stuff, and so like, in the time where we thought when lead paint was good, and is that when a lot of this stuff went down, because that's kind of just giving me that vibe of we might have sent it up there thinking this is perfectly fine, and then it's going into heavy metal toxicity in the fish, because it's been in the water for so long that the metal itself is dissolving, and so that's where my brain is, is I'm not thinking about -- Like you started talking about nuclear, and that honestly didn't even occur to me, and I'm thinking old stuff, stuff that we thought was okay, stuff that wasn't tested, and wasn't regulated, and now it's sitting at the bottom of the ocean forever. How deep are you talking, where you're like, oh, it's in the deep ocean, and it will be fine, and is this deep where fishermen could find it on sonar, or is this deep where it's gone?

MR. KETCHUM: I'm not really the one to answer that, but my guess is that most of it is the latter, and I think the challenge you have is the cost of recovery of that material would be so great, and is that really what you want to be spending your money on, and, I mean, it's not my decision, but, when that could be applied to other things of more -- You know, that's somebody else's call. That's above our paygrade.

MS. CROWE: So, Dale, I have a question, and how much of it is actually going in the Pacific, versus the Atlantic?

MR. KETCHUM: Well, there is still stuff, and like ULA's new rocket is going to be non -- They're going to try to recover the engines, but the bulk of the metal -- The first stage is going to still get dumped in the ocean, but, at the end of the day, that's just a big piece of metal, but, you know, there's stuff on there, and has there been an environmental assessment as to what's the impact of that stuff long-term at the bottom of the ocean? I have no idea. I don't know if anybody has a responsibility and tasking to evaluate that. I don't know that that's part of the process, but I think, to answer your question, the Pacific is the target of stuff that gets deorbited, because it's such a big target.

There are launches in the Pacific, and, you know, Japan has got launch sites, and China has got a lot, and Australia and the U.S., out of California and Alaska, but the busiest spaceport in the world is ours, and that's dumping it off the coast of Florida, but that could be anywhere from, you know, a hundred miles offshore to 2,000 miles offshore, and I don't know. I honestly -- I guess I don't know if the Coast Guard would collect that data, and I don't know who is collecting that data, and I don't know who has been tasked with collecting that data. Probably nobody, but I don't know, honestly.

MS. CROWE: Brendan.

DR. RUNDE: Thank you, Madam Chair. I saw Myra come back to the table, and then step away, but I was hoping to ask a little more about that FOIA request, because I think maybe it relates to what we were just talking about, and is that going to be just what the Coast Guard knows about debris that was dumped inside United States waters, or does that perhaps cover some of these far-flung deepwater things?

MS. BROUWER: No, and I think we requested mainly in the council's jurisdiction, right, and so just in the South Atlantic, and the reason I scurried back to my computer is because I remembered, earlier this year, and, no, it was late last year, that there was a comment period that was open for these temporary zones that the Coast Guard was establishing, and I had to go back and re-read what it was, because I don't quite remember the details, but it was for the establishment of these temporary safety zones, which, from what I understand, is for retrieving, you know, stuff that comes back.

Splashdown retrieval safety zones, I think is what they're called, but, anyway, and so we submitted a comment letter. Roger put that together and, you know, citing concerns. This is when the conversation started, and Laurilee said, hey, you know, some of our shrimpers off of the Canaveral area -- Their nets are coming up with these big, giant hunks of metal, and they provided pictures that got sent to, you know, council members, and so back to somebody asked, you know, is there evidence that these things are in fact impacting our fisheries in this region, and I think the answer is yes, that there is concerns about the release of specific chemicals, and I can't quite remember the name, but all these things were included in that letter, and I would be happy to distribute it. In hindsight, I probably should have sent it to you all, but this was submitted -- I think it was back in November of last year, and so just additional information, so you have a little bit more context.

MR. KETCHUM: If I could address that, and I think it's a given -- You know, there's a lot of jetsam and flotsam in the oceans, but I also don't have any doubt that some of it is the space industry's, and one of the challenges that I have found -- I don't want to say humorous, but ironic is that we get -- You know, fishermen will yell at us that, you know, I had a piece of space debris that fouled my net, and I had to cut it out, and they dump it overboard.

Well, but, by the same token, it's a big piece of debris, and they don't really have a lot of room, and it's a problem of -- I know my CEO -- Well, he just retired, but he was suggesting that there may be a way to have some degree of insurance compensation from like the FAA or some -- You could structure it so that you could be reimbursed if you bring back a piece of space debris, but you're going to have to bring it back, and you're going to have to validate that it is indeed space debris and not dumped overboard from some ship somewhere, but that might be -- Again, it gets to a debris issue. We've got to figure out how do we incentivize the reduction of debris, for the interest of everybody.

MS. CROWE: Brendan and then Wilson.

DR. RUNDE: Thank you, Madam Chair, and I think it would also then be important to incentivize, or disincentivize, the targeting of debris landing outside of U.S. waters, because my concern is that, if you say there is some penalty, or debris has to be recovered by the company if it touches down inside U.S. waters, well, the next thing you know, they're dropping it down at 201 nautical miles offshore, and so I think that's a delicate topic.

MR. KETCHUM: Most of that stuff, my guess is that, even with the small solids, you can see them fall away, but I guess it would depend upon the trajectory, whether it was going straight up or heading more east, but they're landing quite a ways away, because that stuff doesn't fall away until it's really high up there, and it's already moving at a pretty brisk pace.

MS. CROWE: Wilson.

DR. LANEY: Thank you, Madam Chair, and so this whole discussion prompts me to recall the military ordnance that we recovered on one of the cooperative winter tagging cruises, and some of you have heard that story before, but the short version, Dale, is we wound up with a World War III aerial bomb onboard, and that was the first impulse of the crew, was to dump it back overboard, and, in that case, those of us who were members of the scientific party decided that that's not a very responsible approach, and so I will keep it short, but the rest of the story was that we called the Coast Guard, and we said, okay, we've got this thing on the back deck, and now what do we do with it, and their response was, well, we don't do bombs, Laura, and so you have to call the Navy.

We did call the Navy, and we wound up, you know, terminating our operation, which we were going to do anyway, because the weather was seriously deteriorating, and we took it to the Little River amphibious base, up inside of Chesapeake Bay, and we gave it to them, and I don't know what the ultimate fate of it was, and I suppose they took it out and blew it up somewhere, probably, but, yes, it's interesting, when you do pick up things in your gear like that, and I agree that the best approach maybe would be to somehow come up with some way to incentivize people turning it, you know, back in, or at least bringing it to shore, so the next guy doesn't pick it up again, especially if it was potentially explosive.

MR. KETCHUM: Yes, and I think it's a reflection of our industry is new, still in its new stages, because, when it was just the federal government, for exploration or national security, people sort of didn't argue with it, but now it's much more commercial, and imposing additional regulations on it is, you know, probably an inevitable growth, and, like any industry, you get more regulations on it, but there's also -- There's going to be some degree of pushback, because you don't want to encumber, too much, the growth of our industry, because more and more people are relying on it.

You know, without space, these things don't work, and your credit cards don't work, and lots of things go really bad really fast without space, and space-based assets, and then someone will always, and I use it regularly, is the Chinese are moving forward very aggressively, and they have already accomplished a number of things that we never have.

You know, landing a satellite on the dark side of the moon, we've never done that, and they've had a rover there now for two years, and they got -- They landed a rover on Mars their first time, and I think it took us three or four times, and it took the Russians about eight times to successfully do that, and, you know, the Chinese -- They've got every right to be up there, the same as us, and they have a lot of skills, and a lot of capability, and a real determination, and so there is competition, both national security and economic, and so I want to offer that, but, like I said, our industry is growing and maturing, and it only make sense that we -- You know, like I mentioned before, evaluating what's the environmental impact of all these thousands of satellites being burned up in the atmosphere. We have no idea, but we -- As an industry, we need to step up and own that, that we need to know what that's doing to our planet.

MS. CROWE: Wilson, go ahead.

DR. LANEY: Just a follow-up, Madam Chair, and to address a question to Myra or Trish or Roger, and so was the council thinking here that we might need to draft a policy on space debris?

MR. PUGLIESE: I mean, that was something that I think I might have raised when we discussed it, and, I mean, the way a lot of these policies have come forward is when issues have been identified, and, you know, the AP has really kind of picked up on what comments have been made, and then is a policy needed, to try to address what the potential impacts are, and there is a lot that's been stated, in terms of connections, and it would be interesting to see what we get back from the Coast Guard, number one, on where we go, and have discussion from this group on what the thoughts are and what degree you think this justifies actually building the policy, but it's definitely in the wheelhouse of how we've done it before, when it's either a habitat impact or an activity, and it doesn't necessarily have to be a totally negative type of thing.

I mean, I look to things like our artificial reef policy, and that is intended to highlight the coordination, to make sure that there are impacts, and those are the ways you can do that, and then you kind of get it more formalized in understanding everything, plus also, you know, really kind of hitting on some of the topics where there may be impacts to EFH that you want to get ahead of, and so the latitude is there, the opportunity, and the process we've done in the past is there.

MR. KETCHUM: I guess I would say our industry has been at the forefront of providing habitat for small fish out in the middle of the ocean. One thing I would suggest also is, right now, and it's like 70 percent of all the launches in the United States are coming out of the Cape, but the problems that we have there are going to -- Florida is usually always the first, and the problems are here first, but you've got launch sites that are growing in Virginia, and there is some in Maine now, or expected to be, and there was an effort to do one here in Georgia, and I don't know if that's ever going to fly, but there are launch sites, and will be space ports, all over the country, and all over the globe, and so the issues that we're addressing now are going to have impacts, and how we deal with it now is going to set the template for how those issues occur everywhere else, and so I think just keep that in mind as you're evaluating what path you want to take.

MS. CROWE: All right. Thank you. Anyone else have anything else to say? I think that was a good conversation. Go ahead, Paul.

MR. MEDDERS: Since you brought up Georgia, and you probably know a lot more about the Georgia space port than I do, but it seems to me, as I'm sitting here listening to this, that -- I know, when we do artificial reefs, the Coast Guard is very interested in what's in that vessel, or we're about to use some subway cars, and what it is and what it isn't is what they're interested in, and I understand that it's probably falling out of their jurisdiction, when it's not in what we're calling U.S. waters, and so I get that, and so, if a statement is drafted, it probably needs to speak to the bigger global piece, and so I would fully agree with that, fully support that, and then just -- I know that we're talking about habitat, and that's important, but it's not lost on me that, if the Camden space port ever becomes a reality -- So we had a conversation of whether or not it's good for shrimping around Cape Canaveral to close that area, but I know that there's a lot of effects, right there in my backyard, to intercoastal waterway traffic, if it gets closed down during launch, and there's a few fishermen, a half-dozen or a dozen, that make a good chunk of their living tarpon

fishing that closed area that would -- It could significantly impact their livelihood, and so I could count them on one hand, and I could name them, and it's not many people, but it's real important to them, you know, and just pointing that out, that there are some other things to consider, I think.

Then particularly the Camden space port too, and you're flying over Cumberland Island National Seashore, which I wish they called Cumberland Island National Park, because it really is more that thing than just a national seashore and some private residences, and so I hear what you're saying, and we've thought a lot about that in our area, and there's people on both sides of that issue, but I really feel like the Coast Guard should be the ones really weighing-in on this, but then my brain also goes to the Coast Guard.

When you have a spacecraft accidentally explode, and things going in the ocean right nearby, or the waterway, and we don't tell Delta what they can build their planes out of, in case they accidentally explode, and so it's complicated issue, is all I'm saying, and those are the points that I would think about from Georgia's perspective.

MR. KETCHUM: Actually, the FAA has a hell of a lot to say about what's built in those aircraft, and so there are -- There's a way to manage this, and has it -- You know, has it -- In retrospect, has it been done well? No, because, a lot of what we did in the past, we didn't know any better, and I'm sure a lot of what we're doing now we'll look back, twenty years from now, and go, what the hell were you guys thinking, but, you know, it's a part of -- I've spent my whole career in this industry, and it's still a new industry, but we're learning more, as we get better, and this industry grows, and the country and the world are becoming ever more reliant on space to do what we do every day, and we're going to have to --

These are good problems to have, because the benefits of what is coming out of space are spectacular, but these are problems that are going to have to be addressed and managed properly, and we're trying to do our job in Florida as best we can, but, at the end of the day, we don't own the land, and it's NASA, and it's Space Force, and we don't license the rockets, and our job is to just try to see to it that most of that activity is occurring in Florida, but, again, it gets to we also have responsibilities to be good stewards of Florida.

We don't want to be just a stepping stone for industry to get to space, and I live there, and I want the river cleaned up, and I grew up there when the river was clean, and, from just a business perspective, we can't keep the talent if we don't have a nice place to live, and I'm a big fan of rock shrimp, and so --

MS. CROWE: Go ahead, Steve.

MR. MILLER: As far as a fisheries statement goes, it seems to me that we don't know what it is, and we don't how much there is of it, and we don't know where it is, and I think it's pretty hard to draft anything, other than we think this could be something, and, I mean, I don't know how you begin to draft a policy statement on that. I mean, we don't even know what, where, or how much.

MR. PUGLIESE: That's why I think I said the first step is let's see what we get from the U.S. Coast Guard, and then maybe begin to lay out some of these, and one of the follow-ups is all of the different points that have been made about the potential impacts, and we can compile those, and that will be what goes through a port, and the council will provide some guidance too on, you

know, where they want to go beyond here and what directives to this panel, and, you know, I would definitely would be clear, because we talked about what we don't know.

Again, I think that opportunity we have is very similar to what we've done in the past, where it could be complementary to make sure, as we move forward, that development occurs, but it's taking into consideration all these different aspects of habitat considerations as we move, but you have to have information.

MS. CROWE: Thanks, Roger. I think that sounds like a good path forward. Wilson has got something.

DR. LANEY: Well, Steve's comment prompted me to consider too, and, yes, I agree with Steve for sure, and then remember that Simen asked a question earlier about Sackett versus EPA, and how that might impact the space industry from a development perspective, and I think where he was coming from on that, Dale, was the fact that this former Clean Water Act protection has been removed from, you know, wetlands, and it could sort of incentivize the development of some of those areas, and so, if we were to go forward with a policy, that might be something that we want to try and consider as well, but that is a much broader issue.

That not only would apply to the space industry, but it would apply to anybody else, you know, within coastal counties in particular, from the council's perspective, that now have had a protection measure removed, which frees up the potential development of habitat that certainly contributes to coastal water quality and protection of a fishery resource and helping to keep it sustainable, and so where we go on that one, I don't know.

The ASMFC Habitat Committee put that on its agenda, Roger, and so maybe Kathleen and Stacie might want to consider, for next year's Habitat AP meeting, just putting that on there as a placeholder to talk about Sackett versus EPA, and maybe by that time -- I know several states are in the process of assessing what the implications of that decision are for wetlands protection in their jurisdictions, and so hopefully, by the April meeting, we would have a lot more information available on that.

MR. KETCHUM: I guess I've got one quick question, and it's actually for Myra, since she's walking over there, and it dawned on me that I'm going to get executed by my comms people if I don't have somebody take a picture of me talking to this group, and do you have a cellphone, and we've got a pretty savage comms VP, who would delight in executing me.

MS. CROWE: Okay, everyone. Thank you, Dale, for that presentation, and the panel members for all the good questions and conversation, and I think we've made the executive decision that we're going to take a short break and then power through the last topic, and that way we will not be meeting tomorrow, and so unless there are serious objections to that.

MR. KETCHUM: I guess one thing that just clicked with me is, in terms of if you're making a suggestion about -- Even though most of what the debris out there -- No one has any idea, because it's been out there for so long, but, if nothing else, maybe the idea of labeling some degree of responsibility on future launches, so at least we can have some idea where stuff might be, because, at the end of the day, if you dump a booster out there, you know, 300 miles, where it actually -- How it drifts, before it ever gets to the bottom, is outside of my purview, but I think at least trying

to record data going forward would be useful, even if we don't have good data for what was put there in the past, and that's just my thought, and it just popped into my head, but I appreciate it, and this actually has been fun, and I will defer to her as to whether or not she will answer you.

DR. LANEY: Stacie, I had one more thought, based on what Dale just said, and so, Dale, one of the things that the councils have done, in order to try and identify gear that entangles marine mammals, is to require different colors, or configurations, of ropes, for example, for gear that is attached to lines, and so my question is, when you all are -- Or when anyone is doing a launch, are all of the components somehow labeled, so that if -- I mean, to your point, one way to incentivize possible recovery would be to make sure that anything that falls in the ocean is identifiable as to the source, which is the idea behind the colored different patterns of ropes, and so maybe that's something that the industry could think about as well.

MR. KETCHUM: I would imagine that the vast majority of stuff, debris -- If it's recovered, you can figure out who the hell's it was. That is not likely to be a problem, I don't think.

DR. RUNDE: You just slap a prepaid return label on everything.

MR. KETCHUM: Well, thank you, all. It was fun. I appreciate it.

MS. CROWE: Let's do a ten-minute break and reconvene at 3:15.

(Whereupon, a recess was taken.)

MS. CROWE: Okay. We're going to start off by calling for nominations for Vice Chair.

AP MEMBER: I nominate Brendan.

DR. LANEY: To say it on the record, I second the motion.

MS. KEENER: I nominate Paul.

AP MEMBER: I second that.

DR. RUNDE: I am happy to withdraw my nomination, considering that it was, as someone said yesterday, under duress, and this was mildly under duress as well, and so that's fine.

MR. PUGLIESE: I think there's opportunity for -- You know, as we move forward in this, and one thing we've done in the past is we've tried to work with the chairs and vice chairs as our state directors, the state representatives, just because it's been really good to make sure the fisheries are on the frontend of the discussions as we do it, and so it's not in stone, and it's not fixed, but it's something that we've tried to do, and it's to aid some of what the council is doing through the different states and the different coordinating, and so that's an opportunity, but it's you all's AP, and so that's your selection.

MS. CROWE: Okay, and so this by consensus, once again, and so all in favor of Paul as vice chair. All right. It looks like that's a consensus, and so I think we're good. Okay. Well, that was fun. Next up, last but not least, Roger is going to walk us through the habitat blueprint.

MR. PUGLIESE: What I would like to do is just highlight -- I think I reported to you all, at the last meeting, about where the council was in terms of the habitat program and the blueprint under development. The council has approved the blueprint that was provided as one of the attachments, as well as a job description for the Habitat Advisory Panel.

What I will generally identify is one of the things that this did is it accomplished being able to kind of codify, or lay out, a lot of the operations that the advisory -- The responsibilities and the operations of the advisory panel, with some fine-tuning by the council, in terms of what they want to see into the future as they move forward with habitat.

It's a good thing, because what it's doing is it's also providing even more focus, and more emphasis on habitat as the council moves forward. It's highlighting the real benefit of this organization, of this group, and it's very unique, in terms of the operations for advisory panels, because you're creating materials that are coming to the council and being approved as policies, the designations for EFH, the refinement of that information that's actually getting into the field, and so those are some really significant responsibilities and opportunities, and really positive benefits that have happened, and so the program lays out goals and objectives, and I don't have to go into the details, but it really highlights a lot of the connections to the designation of EFH, and the conservation of EFH, and also to be able to provide that information out into the public and into the research needs and into priorities for our region, and really to support the longer-term vision for habitat and conservation, and even some things to still be developed into the future, in terms of outreach and activities, and so, like I said, it's even more all-in more from the council as we move forward.

It highlights the designation scheme over time, and it went from the original comprehensive amendment and through multiple plans that shored like the dolphin plan and the future comprehensive -- The second comprehensive and first comprehensive amendments, where they added in refinements and designations of how we established mapped areas for the councils, submitted directives, and then, finally, highlighting the user guide, which is like the foundational information production that goes out that highlights the designations, the clarifications, a lot of the refinements that you're doing for the EFH five-year review at this time, and then it does touch on the reviews and the actual designation timeframe by FMP and by areas.

The actual advisory panel, it highlights the advisory -- Now, this is just a snapshot, relative to the overall advisory panel operations that's in the job description, but it highlights that the AP is being reconstituted a little bit now, and it's going down to a twenty-six-member AP, and it still has the four state panels, and I think that's one of the big things that I wanted to, again, re-highlight, is that it operates as panels and then at-large membership, which is what we've done in the past, and it does leave the latitude for, you know, expansion over time, as the council has more challenges, has more capabilities, has more needs.

A couple of the key things is it lays out the purpose and the tie under Magnuson, and it does rename the group as the Habitat and Ecosystem Advisory Panel. Originally, this was called the Habitat and Ecosystem-Based Management Advisory Panel. There's going to be activities, I think, that are going to be focused on things that this group would not necessarily -- Like MSEs and different things that are in the weeds, in terms of implementing into the fishery activities that are separate somewhat from here, but it's still the habitat and ecosystem conservation, the bigger picture as well as the detailed information.

Refining conservation to make sure it's broad, not only organizational, but individuals, and, really, that makes it open-ended, so that you can get interested as well as organizational participation in here, and the charges, as I mentioned, are really highlighted in the description that I will touch on.

One of the things that is added into here is also that there's going to be an annual activity report that Kathleen will touch on and outline that we've been working on, to kind of lay this out, and what that's trying to do is to provide a nice snapshot, on a year, of comments that were made, the usage of those comments, research and monitoring recommendations, and future developing threats and issues, and so, I mean, it's kind of encapsulating what we have here, but on an annual basis, and it will draw from like Pace's annual report on what all they actually got in, as well as other areas, and what I think there's really some intention, and you will get into the details later on, is to be able to highlight other partner activities, and the states activities and research, things that are supporting the broader conservation, habitat, and ecosystem activities in our region.

As I mentioned, the membership, and this is the new layout. It has the fisheries agency, the CZM, and then two at-large seats, and that can be either conservationists, fisheries, or researchers, and the idea is just to standardize that some and making sure that we have our partners with National Marine Fisheries Southeast Center, Southeast Region, and we need to bring back in our marine sanctuary representative, and that just has fallen to the wayside over time. It did -- We still have our representatives that we have now, and with one at-large seat.

It does highlight some of the -- As I mentioned, it really does kind of lay out operationally, so that people, when they want to know how it is, and council members specifically, this highlights how it happens, and so it does kind of codify this idea of ad hoc working groups to accomplish development of policies, development of issues, development of EFH review components, and so it lays that out, and how that operates, and how the -- You know, that's the operational components of it, and it provides that mechanism.

The membership and appointment is really just going through the process of the way the council does AP appointments, at-large seats, but, in this case, we have a number of different ones that are agency organizations, and so it's really just an acknowledgement, through processes going to this group, and so those seats are fixed, and we just need to have an acknowledgement of actual representation in this organization.

It does lay out the whole consultation coordination with National Marine Fisheries Service, and it talks about how you're getting reports in the beginning of the year and then annual reports, but it also does highlight the council's process of the couple of different tiers, and one of the things that I like in this is the fact that what it does is it, again, lays out this issue, where you have a couple of different tiers of levels of comment, from the simplest, where, if we have something that is clearly in violation of one of our policies, and the council has developed the policy statement, that we can go through a fairly rapid process of, you know, providing the coordination with our chair, our committee chair, and providing a response, so that -- Especially when you don't have a timeframe.

All the way to where there could be a directive that we have a review, and it comes to the AP, and the AP puts together material, and it comes to the committee, and the committee approves it, and it goes to the council, and the council approves it, and so we've got that gamut of how to do that, and that's kind of laid out in this whole process.

It does highlight the potential for tracking both our council comments as well as coordination with National Marine Fisheries Service on how they are providing those comments over time, and more detail as needed, and as developed. It does lay out the entire EFH policy development process and how you move forward with identifying a need from a member, a council member, from coordination with other representatives. In the past, it's been if it's an impacted habitat or an activity, and those kind of at least provide two vehicles from which to move forward and develop a policy for the council.

The tiers, the utilization of the workgroups, advancing that to council consideration and, ultimately, approval, and so, again, it's really just highlighting a lot of what this organization, this group, has done over time.

It does include the threat areas that has been identified, lining them up with the actual policies, and then the policies themselves, with links back to the policies, some condensed versions of what they represent, and support information for the council. There is the opportunities, as we've done in the past, of building tools and capabilities. Some were online originally, and this is going to be an evaluation, as you move forward, on how to advance that information and build it. In this case, it talks about the existing tool capabilities of mapping services that have been developed in our collaboration with FWRI. It lays out the capabilities and structure of those.

Then it just highlights -- There's going to be an entire partner section that highlights the ecosystem partners over time, and it's a fairly extensive group that we have doing it, and it's evolving. You know, all that discussion we had with Rua and SECAS, and now with potentially our space organizations, and so opportunities to look at it.

One of the things that I said, one of the newest ones, is going to be development of an outreach and communications strategy, and that will be a developing activity, and, again, this is a good thing, because it's going to highlight a lot of what's been done and then set the stage, so people understand very clearly what the directives are, what the efforts are in the longer-term vision of habitat conservation in our region.

In addition, there is a workplan, that Kathleen is going to touch on, in terms of advancing this, as well as an overall blueprint evaluation, and that constitutes really the overall blueprint, and, as I said, I think the big thing is it really kind of lays out exactly what -- A lot of these operations that we've just done over time, in a more fixed and very clear presentation.

I'm not going to go too far in, because I think I laid out the structure, and there's a job description, and the council has these laid out, and this is really tailored somewhat on -- The closest thing would be our SSC, and so it gets some structure from that, in terms of authority, responsibility, tasks, that you're charged with, and I've highlighted most of those, and you've been doing most of those at this meeting already, from, you know, specifying refinements for EFH to policy statements and comment and coordination.

Meetings and activities are highlighting the annual meetings, two meetings a year, and the working groups, the state sub-panel operations, how we operate and how we coordinate, and hopefully that's something in the future that can even go beyond -- There was an idea that those can operate as an issue comes up and focus one of the panels to address that and bring it back and be able to

coordinate, and that's something that is still evolving. Then the composition I've already highlighted, in terms of twenty-six members. One of the things -- Yes, and I pretty much laid out the layout of that, and so that's the newly-constituted group here, and, with that, I will pass it over. There we go. So the annual report.

MS. HOWINGTON: We need to do the workplan first. One moment, please. Technical difficulties. Here we go. Okay, and so, like Roger said, the blueprint and job description were approved by the council in the September meeting of 2023, and so now we are moving forward for the next steps, and, in that development process, the South Atlantic Council has started developing a SAFMC Habitat Workplan.

The idea is that this would be something that would help us plan one to five years out, and so, just to go over some of the recurring tasks, we have our recurring tasks, and this would be like the annual report that I'm going to go over. In the future, this would be something that would be happening every year. We would be filling it out and submitting it to the council. Then updating this workplan, and so we have our to-do list of what we need to be doing, and then convening two meetings every year, at least one to be held in-person.

Then intermediate tasks, and this would be preparing a workplan, what we're doing right now, and then, again, reviewing the blueprint and developing the plan, and so that's a lot of stuff that's happening right now, and completing the initial information outlines for the tools and partner evaluations, and so that is actually me and -- Roger and I have been working on that, and Roger has thirty-eight years of experience in developing this AP, and so a lot of this is me pulling information out of his head and writing it down. That tools and partners evaluation is currently ongoing, and you all are going to be seeing it in the future, but he is helping me develop that, and you all are going to be getting that soon.

Then, of course, we move into short-term long term, and so short-term, in the next year, we need to be developing that EFH five-year review, and I am working on the habitat website page. One of the things that we had is the South Atlantic Council actually just transferred over to a new webpage, and, when we did that, we realized the habitat page has a lot of information on it, and it wasn't necessarily the most efficient way of distributing that information, and so we are working on coming up with a gameplan of how to outline this website where people who need this information can get it, and get it quickly, and not have to jump through three or four clicks to be able to get to it. Again, we will be coming to you on that.

Developing the communications strategy, I've already been in touch with the Outreach and Communication Advisory Panel, and so they are aware that we are going to be requesting their help on how to communicate habitat efforts to the public, to try and get them a little bit more involved in what we are looking at, and get them to start thinking more ecosystem-wide, and then, of course, the tools evaluation, and so, like I said, partner tools evaluation, I'm working on that with Roger, and I will bring that to you as soon as I finish pulling everything out of his head.

Then, long-term -- Five years from now, we need to do another EFH review, and so that's what this workplan is about, is we are going to be, hopefully every meeting, or every other meeting, adding to our to-do list of what should we be looking at, what are current habitat concerns, what should we be bringing up, and we will be developing this, and it will be -- I hate to say a living

document, but it will be a to-do list for us to be able to keep us on track and constantly working and bringing up new information.

As I'm reviewing this, again, the habitat -- If you want to go through it, and I'm not going to go through every single detail of this, but the habitat tools and products, and I'm already developing a table to try and help us organize these and figure out who the target users are, who the actual users are, and so are we getting to our target audience, or is somebody else using it, and how much are they being used, and I've already requested website statistics and analysis, and so I'm working on that, and a cost and funding requirements as well, and hopefully, once I get all that information, then we, as a group, can develop an overall evaluation on what these tools were and answer these products here. Are we meeting our EFH obligations? Are we meeting what we need to be meeting for BSIA?

The same thing with the habitat partners. I am building this table. As soon as I have all this information, I will bring it to you, and then hopefully we can start analyzing cost-benefit analysis. Are we -- With partnerships that we're working with, are we meeting our goals and our needs and our objectives of our workplan, or are we not?

The habitat webpage, and, like I said, there's a lot of information on that webpage. What's the most efficient use of it, how do we share it the best, how do we meet our target audience? We're going to be developing these and coming to you and asking for feedback and going to the outreach and communication group, who their entire job is to help spread information to the public, and we'll ask them what they think of our webpage and how to make it more efficient.

Then, like I said, communications strategy, and I've already gone to the OC AP, and they're going to be helping us develop this, where hopefully we can start getting public comment and getting the public to come in and talk with us about habitat, talk with us about ecosystem problems, talk with us about space debris.

The feedback I would like for this, before I move on to the annual report outline, and I recognize that I just threw seven pages of PDF at you really fast, but are there any tasks, other than this paragraph right here, 1 through 5, that you feel like we need to be tackling in the next year? So this is not thinking long-term, and this is not thinking medium-term, but this is just in the next twelve months, and is there anything else that you would like to add to this?

Number 6, I will go ahead and add a caveat, and Number 6 has already been added. The South Atlantic Council, in September, required that we add to our next discussion, for the next year, loss of artificial reefs into our overall workplan, and so that's Number 6, and so does anyone have any suggestions for a Number 7?

MS. KEENER: This is just a suggestion, and I have seen, on the New England site, I believe, and both the Mid-Atlantic site, that those councils have a page on their energy policy, development of their energy policy, related to wind. Thank you.

MS. HOWINGTON: All right, and so that's a great idea. Maybe we need to have a separate webpage specifically for our policies, or just our energy policy. Something like that, or do you just want me to explore?

MS. KEENER: I think wind should be called out, in particular, and so, I mean, this is part of stakeholder engagement, and that's how I see it.

DR. LANEY: Thanks, Kathleen, and so this is more of a question than a suggestion at the moment, but do we have, as a council, species fact sheets? The only reason that pops into my head is because the ASMFC Habitat Committee is responsible for sort of tracking and updating the species fact sheets, which are kind of one or two-pagers that are useful for stakeholders, and I can't remember, and maybe Myra can help me out with that, but I can't remember whether we have the similar kind of species fact sheets at the South Atlantic Council or not, and, if so, whether the AP is supposed to have any role in like, you know, updating those.

MS. BROUWER: We have talked about that, Wilson. It's kind of a long-term item that I think John Carmichael would like to see us spend some time on, but we have been focusing on other types of fact-sheet-like products. For example, Chip Collier, who just left, puts together these really nice applications, and we call them fishery overviews, which basically include all the life history information, up to whatever date he updates it, all the landings information for that species, any stock assessment information, and so I think -- I want to say we kind of do have a similar product, and it's not, you know, a very portable thing, and it's not something that's printable, but we have talked about it.

The other thing that is similar, I think, is our fishery performance reports, which we do with all of our species APs, and that's sort of a summarization from the stakeholders' perspectives, of what's going on in the fishery, and it covers life history, and it covers market conditions, and it covers all types of socioeconomic information, as well as management, ecosystem impacts, and, you know, are they seeing shifts in distribution, or, you know, shifts in where things are spawning and that kind of stuff, and so, anyway, a long-winded answer to your question.

DR. LANEY: Well so just a follow-up. I know, Roger, we had put together the database of life history information on all the fish species that I guess was being maintained on the Florida FMRI, or whatever they're called now, data -- The server, whatever, and has that gone away? Is that not accessible anymore, because there was a tremendous amount of information there that, if memory serves correctly, we spent a fairly good amount of time compiling, and that was useful mostly for a technical audience, and not so much for, you know, stakeholders, not so much for the lay audience, and so I don't know. I guess I would defer putting it on there as a 2024 task, but certainly it's something that we should think about, and especially if Executive Director Carmichael thinks that's a good idea, you know, at some point, to come up with species fact sheets, and I think that would be kind of a fun thing for the AP members to do.

At least it's something -- It's a pretty -- The initial lift is a bit higher, but, once you've got one prepared, then, after that, the annual review and update of those is a pretty easy lift, because all you have to do is look and see if there's been any additional really significant literature that popped up that explains more about a species life history than what we thought we knew in the first place, and so I just throw it out there as a possible future task, maybe, especially if the council thinks it's a good idea and wanted to task the Habitat AP with doing that.

MS. BROUWER: Right, and so update on the -- I think what you are asking about is the ecospecies database, and so that was a compilation, and so I realize that it had a lot of information, but it was -- A lot of the information was also very dated, and nobody was updating it, and so that was one

of the things that we talked about with the workgroup that developed the blueprint over the last two years, and John Carmichael said, well, you know, if this is not being developed, and nobody is using it, I see no point in continuing to devote staff time to maintain it, and so, you know, it basically still exists. It lives on the server at FWRI, but my understanding is that it's really not being updated, and so, unfortunately, that's not something that's available, and it just wasn't serving a purpose that was, you know, relevant to anything the council was needing at the time, and so that's where that is.

Again, like I said, I think John is supportive of the fact sheet idea, and it's just, you know, an additional task that we would have to coordinate with the species APs and all that stuff. We have talked about it, and it's on our radar, and so we'll definitely keep you guys updated on that.

MS. CROWE: Brendan, go ahead.

DR. RUNDE: Thank you, Madam Chair. I don't know how much of this is the purview of the Habitat AP, but I also just wanted to point out the existence of the species profiles that are an appendix, essentially, on the South Atlantic climate vulnerability assessment, which contain much of the information, and you yourself, Wilson, of course, contributed to many of those, I'm sure, and they contain a lot of the information that you're asking about, and so, once again, those are a snapshot, as of September 2019, and possibly a little later for some of them, and they would probably call for updating every now and again, but that information is already compiled, and it's already been reviewed by, you know, alleged experts, and I use quotes because I'm on that list, and so, you know, that resource is there, and it's a tech memo already, and it maybe could be drawn upon for what Wilson is asking about.

MS. BROUWER: So, just to explain Number 5, that is something that was added in September, in addition to the one that's not on the screen that Kathleen just mentioned, and this was a request from Laurilee Thompson. We were talking about her a minute ago, when Dale was here, but she wanted to make sure that this particular item, impacts from the freshwater releases, was on the Habitat AP's, you know, workplan long-term, and so we kind of just put it on there so we wouldn't forget about it, and that's where that came from.

MS. HOWINGTON: While we're talking about things to put on there so we don't forget about it, should I put something on here about space debris and reviewing the Coast Guard FOIA, and so, that way, we don't forget about it, because I feel like that's something that's relevant and we should probably be talking about the next year.

DR. RUNDE: Is there some communications about that that we would want to have? This is the communication plan, right?

MS. HOWINGTON: This right here is just our tasks for 2024, which I cut off the communications part, and so this is just hopefully what we're going to be talking about over the next year. This is the communications strategy.

MS. DEATON: Is the energy policy -- Is that included under the EFH assessment, or should it be a separate thing?

MR. PUGLIESE: I think this area, in the end, was really tied to the communications strategy on this, and I think the beginning has some discussion on EFH, that maybe those can be highlighted or connected to, and I think that's what it -- It's up towards the front, and it lays out some of the different things. That is where some of these -- So you've got the partnership, and it's part of the EFH review. The energy policy was part of it, and so I think that covers you all in this.

MS. HOWINGTON: All right, and so the next thing that I would like to go over is back to here, our reoccurring tasks. This is new, a habitat annual report, and the idea behind this -- There's a little spiel here that you can read, but this is something that the council is requesting of us to develop every spring and then present to them whatever the following habitat committee is -- The next time that the habitat committee is scheduled to meet.

It's meant to address habitat and ecosystem conservation activities, consultations, comment letters, a lot of the stuff that we've been through in this meeting, but it's not going to be the Habitat Committee report. It's supposed to be something kind of outside of that, and so, for our state members, this could be a really good place for you to highlight some of your projects that wouldn't necessarily go into the committee report, but that the council may be interested in.

Roger and I developed a really, really draft outline of what could potentially be in this report to try and meet the council's request, and we would love your feedback on this, if you think that we've hit all the right points, if you can think of anything else to add in, or if you think we need to kind of flesh this out, and this would be something that I will probably be emailing to you guys in January and February, trying to elicit comments and things to add, and then I will come to you, in the April meeting, with kind of a rough draft annual report for us to flesh out and submit to the council, and so that's the plan. Please just review this, and it should be in the briefing book, Attachment 7d. Please review kind of what the council requested be in the report and then our draft outline and then give me any feedback that you can.

MR. PUGLIESE: I think the reality is that this is the first cut at a layout. The committee will be discussing this, and you all have the opportunity to fine-tune and develop this for that, as you move into the next meeting, and so I think a lot of the pieces will probably come together as you kind of focus on what each one of these different pieces might be, and so I think this was at least to kind of establish this as a process, establish kind of a layout, and then opportunities, and are there things missed in here that you would like to see or whatever recommendations you would make.

MS. HOWINGTON: If you can't think of anything to tell me today, and I saw your hand, and don't worry, but please feel free to email me. The briefing book is in a week-and-a-half, and so you've got a week-and-a-half.

MS. CROWE: I think Wilson had his hand up first, and then Paula.

DR. LANEY: Yes, and so, just looking at the Number 2 there, the update of major regional activities and projects in the South Atlantic, would it be appropriate for us to add things like SASMI, that we just had a discussion on today, and, you know, what are they up to, and what are they doing, any new developments along those lines, because saltmarsh is such an important habitat, especially in the South Atlantic.

Then, also, thinking about Rua's presentation, the whole SECAS is something that we're very much interested in, and we've been a partner in that from the beginning, and so I think, from my perspective, both of those would sort of qualify as major regional activities that are conservation oriented and help us, and the council, to identify what habitat priorities should be.

MS. KEENER: Would that not fall under Number 5, regional projects/activities?

DR. LANEY: Yes, and either place, I think.

MS. KEENER: Okay, and I would just suggest that we think about adding a final Number 10 that would be looking forward, you know, and what are we expecting in the next upcoming year. Thank you.

MS. HOWINGTON: So future habitat-related activities of interest, something like that?

MS. CROWE: Kathleen, for Number 4, what Pace talked about for emerging threats, and we had tide gates and living shorelines. Then what are you thinking as far as coordination between regions? Is that directly related to maybe like threats or something?

MR. PUGLIESE: Wind.

MS. CROWE: Okay, and you're thinking more like --

MR. PUGLIESE: I think some of that was potentially that crosswalk with our partners in New England and the Mid-Atlantic, or even in the Gulf or Caribbean, and it depends on what -- I mean, it's a placeholder, mainly, for that, whatever kind of coordination. Some of these different things have happened across a couple of councils, and then some across all, and that may highlight things that are going on at the habitat workgroup that cross the entire nation, or on say the climate strategy that we're working with the Atlantic coast, or maybe habitat aspects of that. Like I said, this is a placeholder that you all figure out what some of those most important things in there would be.

MS. CROWE: Casey.

MS. KNIGHT: Would we want to add space debris under the potential future developing habitat threats?

MR. HOOKER: This just jogged my memory a little bit, and I don't think I have -- I can't remember if I discussed this with this AP, but, earlier, I mentioned -- I think it was the -- Anyway, one of the recent statutes did give us authority to do offshore wind in the Caribbean, in the territories, and so, I mean, it's good that you're capturing territories there, the Caribbean, and I just wanted to make sure that I communicated to you that, yes, that's -- We actually have sent a team down to Puerto Rico to start, you know, having those discussions, if Puerto Rico was interested in offshore wind, and so that's just an opportunity to put that on the radar.

MS. CROWE: Did I see a hand over here? First Paula. Go ahead.

MS. KEENER: I mean, I hate to get into wordsmithing, but, for Number 10, "future habitat", and I would either change that to "potential future habitat" or "anticipated", because "future", to me,

means that it is defined already, and it may not be, but, I mean -- Whatever, and I don't know. I'm too tired. Thanks.

MS. HOWINGTON: Wordsmith away. I am typing very quickly.

MS. CROWE: Wilson, did you have a comment?

DR. LANEY: Yes, and I'm not sure where this fits, but, again, I will defer to Myra and/or Trish, and I know one of the things that I think Chip initiated was having webinars on topics of great interest and use to the council, and one benefit of having those online is that you can have a more extensive discission, for example, of a particular topic, and I know we had one that I sat in on on dolphin tagging, and the results of all the dolphin tagging, and so, again, I'm not sure how it would fit in here, but I guess, if the Habitat AP thought that it would be useful to have a webinar on a particular topic, that we could suggest that to staff, and/or the council members, to see if that was something that there would be sufficient interest in to hold a webinar on it and schedule it.

MS. HOWINGTON: To that point, yes, the seminar series happens monthly, and, if you have anything that you think would be of interest that you want to request, email Chip. He is always begging for ideas, and so that -- We don't necessarily need to add that in here, and that's just an announcement. If you have a seminar that you think would be of interest to the council, go for it. Email Chip, or email me, and we would be more than happy to host you in the seminar series, like I said, once monthly, and so that sounds great.

MR. PUGLIESE: I think one of the opportunities -- That one is fixed, and I think we're already trying to pin down Laurent to highlight things that he has done, in terms of sound and managed species, operations, movement, spawning, et cetera, but there's an opportunity to maybe even add in a habitat series and have a focus on activities and policies and operations, and so that's something you can think about, and you can deliberate, because I think there's enough there that we could -- You know, given everything that this group is involved in, individually and some of these activities, I think that might be a good way to do it. I mean, the way I look at it, it would be similar to the way that ASMFC does the habitat hotline, and this could be a webinar to focus on activities in our region. That's just an idea.

MS. CROWE: Casey, go ahead.

MS. KNIGHT: To Wilson's point, you know, would it be beneficial to add a section on the just outreach and communication, any kind of updates on what we've done for the year there? Then, also, as far as potential developing habitat threats, I know we talked a little bit yesterday about the pressure waves off of the pile driving, and is that something that we would want to add there too? I know it's more of like an animal than habitat, and I don't --

MS. HOWINGTON: Any other thoughts? Again, feel free to, you know, wrack your brain and email me. That is perfectly fine. One other thing that I would love your feedback on, and this is via email, is this long-term to-do list. Right now, all we have is the EFH review in five years, and is there anything that you think, back to I believe it was Paula that just added this to the list of potential future, or anticipated future, habitat projects that we could potentially be working on now, or trying to tackle, or just trying to build the infrastructure, so that, that way, when it comes down the pike, we're ready to go?

MS. CROWE: Wilson.

DR. LANEY: Okay, and so this would be really long-term, probably, but one of the things we've talked about a lot, and it was sort of in association with talking about the Ecopath with Ecosim model, which we actually now have developed, thanks to Roger's vision and foresight, is trying to tease out habitat production relationships. You know, it's something we've talked about a lot, and there's not very many of those out there, and, I mean, the idea would be that, given that habitat is where it's at, and where it's at is habitat, and, if we don't soon gather that, we just might lose our habitat, then the very most important aspect of that, from a fishery standpoint, is how much fish can you produce with the habitats that you have.

That's sort of the carrying capacity issue, I suppose, and it's talked about a lot, but, for most species out there, we have no idea what the actual production capability is, and certainly not for optimal habitats, and certainly less so even for sub-optimal habitats, and so I would just throw that out there as certainly a very, very long-term, probably, thing that we could think about, and the only one that I know that exists, and my colleague, Dr. Runde, may know of others, but, you know, the one that comes to mind is the extent of intertidal vegetation and shrimp production.

There was a paper done, back in the 1970s on that, and then there was a subsequent review of that, and pointing out some of the shortcomings of that initial study, but, as far as I know, that's the only one, and I don't know of anything else that said, you know, Habitat X can produce X amount of pounds per year of Species Y, which is something I think would be of a great deal of interest to the council.

DR. RUNDE: I don't know of any others, Wilson, although the artificial reef production, versus aggregation, debate continues to rage, especially in light of the impending offshore wind build-out, and so there may be some more, and more interesting, empirical investigations of that topic going forward, but the one that I wanted to bring up is so the SERFS, the trap video survey, is mostly used by SEDAR, and the council, to create indices of abundance that go right into stock assessments for primarily the snapper grouper species, but that survey does have that video component, which is increasingly important, and, from that video, we get not only counts of species, but also information about the habitat in, you know, surrounding -- Where the trap and associated video camera are.

These data exist, and I don't know how much of a lift it would be, and certainly somewhere between zero and herculean, but, on the species profile thing, you know, there could be some sort of modeling exercise to shed light on the habitat use of each snapper grouper species in the region, and maybe some of that is underway now, but that's dynamic too, and it goes along with how distributions are shifting, and so there's so just a whole wealth of things that could be done there.

I know, right now, we're in a position where SEFIS can't even analyze all the videos they collect every year, and they're only analyzing something like 70 percent, which is a separate issue, but that just goes to show that there's definitely no money for them to do what I just described right now, but I dream of a future where someone has the time and money to analyze those data.

MS. HOWINGTON: I actually have done some of that with the SEFIS video, some habitat analysis, and not necessarily with species use, but I do know that there are projects ongoing that

have done that, and I would need to see if they're still going, and I believe I was doing that underneath somebody's doctorate, and they were asking for help, and I was helping them, but I do know that some of that has already been done, which is good, and that is an awesome project, and I like the idea, and so you and I can talk about that later.

MS. CROWE: Wilson, go ahead.

DR. LANEY: That prompts me to think about another thing that maybe we ought to think about, and that is, is it possible for us to use artificial intelligence to analyze some of those videos? I mean, that would be a tremendous time-saving, and labor-saving, device, and a positive way to use AI that I don't think anybody would have an objection to. I know the Fish and Wildlife Service, years ago, was using something probably equivalent to AI to count large white birds that show up real well in aerial photos, you know, and so tundra swans and snow geese and things like that, and you could count those very easily, and I guess they called it machine reading back then, as opposed to AI, but it strikes me that, you know, that would be -- Those videos would be one way that you could possibly do that, and do you know, Brendan, or Kathleen, if anybody is working on that now already?

DR. CHERUBIN: Actually, NCOS has, with the lead of Bill Michaels, and they have physically hired a company to create a software to do exactly that, and so it's freely available, and everyone has access to it, but I guess, you know, it's not easy to start working with, to implement, to understand how it works, and it's very AI basics, basically, and so there is one in the U.S., and there is another one in Australia, by another Australian university, and I forgot the name of it, but I can look it up. That's also available, and that's exactly the same thing, and those are the only two for marine research, and so you can create your own library of images, or videos, to train the algorithm, and that becomes specifically for your data, because it's not universal, because there's a lot of variation in the images, et cetera, et cetera, but you can have your own model for your own data and work with that, and so that's what I know.

DR. RUNDE: Do you have a sense of maybe how far away we are from that being operational? I mean, are you talking like a year or five years or ten?

DR. CHERUBIN: No, and it's available right now.

DR. RUNDE: Okay. What about for like reading SERFS video?

DR. CHERUBIN: Yes.

DR. RUNDE: Okay. Great.

DR. CHERUBIN: You just need to download the software, and it's free, on your computer, and then that's it, and you can start working with it, but there's a learning period that is pretty tedious, because it doesn't work right away, and so you might as well create your own, if you can.

MS. CROWE: Paula, go ahead.

MS. KEENER: When I think long-term, I think about climate, and we had the presentation on the climate vulnerability assessment, and I don't even want to get into a conversation right now about

how this would be structured, or how the information would come to the council, or to the AP and/or council, but I think some way to capture, long-term, changes in species distribution, EFH, coverage of area, and I don't know, and it just seems like this group should be able to capture that kind of information long-term, and not collect it, but compile it.

MS. CROWE: Kevin, online, did you have a comment?

MR. SPANIK: I was just going to comment, quickly, about the video trap surveys, and I'm not familiar with any AI, but we are doing like stereo-video measurement, using that technology, and I also wanted to make a quick comment that some of that, at least on the really fine-scale, since they're, you know, paired with baited traps, that there could be some attracting, so that, where you're seeing individual species, it might not be exactly where they would be naturally, since they soak for, you know, ninety minutes, and it's possible that some fish could be attracted from nearby, and so you're not able to tell exactly where they naturally would be.

MS. CROWE: Thanks, Kevin. Anyone else?

MS. HOWINGTON: I will follow-up. I remember a talk, and I cannot remember who gave it, on AI and video, but, since everyone seems interested, I will look and see if we can get a seminar series on it, and I will forward it to you guys, and see if they can't come talk, because it is very interesting to see how they're actually training these algorithms and using this AI to be able to try and analyze our videos, but that's a different point that has nothing to do with this.

DR. CHERUBIN: Quickly, I just sent the link to everyone to the toolkit, so that you guys can take a look at this.

MS. CROWE: One comment, Kathleen, I think, and Roger and I were talking that possibly some of the potential future developing habitat threats may need to go into your long-term --

MS. HOWINGTON: Okay.

MR. PUGLIESE: The long-term, yes. I think, when we're talking about policy development and different things, some of those might shift from the short-term to the long-term, in terms of really being able to get to a number of those different ones, but I think it was good to go through and lay all these things out, and then wherever they fall.

I did want to make one last point, and that is I think we need to push, in our region, to ultimately get a habitat assessment. It's been done in other regions, and I think we need to get them to move forward, and somebody at National Marine Fisheries Service has done it in the Northeast multiple -- You know, I think they're in multiple iterations, and that would feed into where Wilson was talking. I think, if you had the assessment, then you could add additional tools and then go further, and then there are other things that could feed into that. Under the SEAMAP program, FWRI is being funded to do some species distribution information, heatmaps and different things, and so all of those can kind of converge as we move, but the habitat assessment, reemphasizing the need to do that for our region, I think is going to be important as a long-term effort.

MS. CROWE: Kathleen.

MS. HOWINGTON: All right, and so that is the end of my talk, and so I believe, Madam Chair, with your permission, we can move on to Other Business, where I do have two things. Well, I had three things to add, but then we already voted for the vice chair, and so now I only have two. Is that okay with you, Stacie?

MS. CROWE: Yes.

MS. HOWINGTON: All right, and so the first thing is, again, pencil in the dates of April 22 through 24, and not May, but April for the next Habitat AP meeting. I will finalize that in December, and I will be sending out an email for a save-the-date, and I just want the council to finish this workplan discussion, and we need to go through the new Habitat AP participation structure that Roger went over, and so, once we finish those two conversations, then I'm going to sending out the save-the-date to everyone and let you all know.

The other, the last piece of Other Business that I have, is I actually have Meg Withers on, and Meg Withers is the South Atlantic Fishery Management Council's Citizen Science Project Coordinator, and she would like to give a little spiel and ask for some volunteers, and so if you would be willing to give her some time, Madam Chair. Is that okay? All right. Meg, are you on?

MS. WITHERS: I am on. Can you hear me all right?

MS. HOWINGTON: We can. Thank you.

MS. WITHERS: Awesome. Thank you. Good afternoon, everyone. Kathleen, you nailed my title, and that's fantastic. I am popping on, real quick, to chat about our Citizen Science Projects Advisory Committee. This committee is primarily responsible for helping us to identify our citizen science research priorities, and it really kind of drives the projects that we choose to pursue. This committee is made up of representatives from the APs, which is really valuable, because it's important to have perspectives from the APs when we're kind of assessing and thinking about these research priorities.

As Kathleen mentioned, we're looking for another volunteer from this AP. Jeff Soss is already currently a member, and so thank you so much, and this committee meets once a year, via webinar, and we recently had our meeting, and so you wouldn't be meeting until next year, and so there's a little bit of time between now and when you would actually be kind of conversing with the committee, and so I just wanted to see if anyone would be willing to join this committee. Please feel free to speak up, and I, obviously, can't see you, but please feel free to speak up, or, if you want to think about it, you're welcome to email me at meg.withers@safmc.net.

MS. CROWE: Casey, did you --

MS. KNIGHT: Hi, Meg. This is Casey Knight, with the North Carolina Division of Marine Fisheries. Several of the programs that I oversee deal pretty heavily with citizen-science-type implementation, and so I think I would -- I would be interested.

MS. WITHERS: That would be wonderful. Thank you so much. I will be in touch with you, and either I or Julia Byrd will be in touch with you. Thank you so much. We appreciate it.

MS. KNIGHT: No problem. Thank you.

MS. WITHERS: All right, Kathleen. That's me.

MS. HOWINGTON: Thanks, Meg.

MS. WITHERS: Thank you, everybody.

MS. CROWE: Okay, and so -- Sorry. Paula, go ahead.

MS. KEENER: I would just like to thank Roger for all of his great work with this committee, and with the council as a whole. It's not an easy job, and you really have to have a certain kind of personality, and be a little crazy, to want to push through a lot of this stuff, but, Roger, thank you. You've done an excellent job, and you're just very patient, you know, and you're really organized, and, on behalf of the AP, and I'm sure you will get the information from the council tonight, but I would just really like to thank you for your leadership and your passion and your tenacity to get us to where we are, and so thank you so much. *(Applause)*

MR. PUGLIESE: It's ben just an honor and a privilege to be able to go from virtually nothing to where we are today, and the passion from the members involved in this group is what has kept me going too, and, as I said, this is a very different creature. It actually makes a difference, and pushes things forward, and we've seen a big conservation ethic in the South Atlantic, and it is always pointed to as a model for the nation, in terms of how we operate, and so I really appreciate the opportunity to be able to do it, and it's starting to really settle in now that I'm stepping away, and I'm losing the reigns of being able to get in here and do things, but I have all the faith in the world that you all -- This is a heck of a group, with you all at the table and other -- You know, the rest of the members. You will definitely advance things, and I'm sure that Kathleen will do a good job of keeping you all on track and moving forward, and so I appreciate it, and you all can buy me a drink and get together, but stay warm though.

MS. CROWE: Okay, and so just one last thing is we always open it up again, at the end of the meeting, for public comment, and, Roger, you could always come back in the future and make public comment, and so, if we have anyone who would like to make a comment, and do we have anyone online?

MS. HOWINGTON: I see no hands raised online, and nobody is trying to unmute themselves, and I think we're good.

MS. CROWE: Okay. If there are no comments, then we will adjourn. Hold on.

AP MEMBER: I was just going to move to adjourn.

MS. CROWE: Great. Thank you. All right. That's it. Thank you, all.

(Whereupon, the meeting recessed on November 2, 2023.)

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Transcribed By
Amanda Thomas
January 4, 2024

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HABITAT PROTECTION & ECOSYSTEM-BASED MANAGEMENT ADVISORY PANEL

Nov. 1, 2023

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Webinar ID	Actual Start Date/Time	Duration	# Registered	# Attended
950-132-083	11/01/2023 12:20 PM EDT	4 hours 27 minutes	16	12

Staff Details

Attended	Interest Rating	Last Name	First Name	Email Address
Yes	Not applicable for staff	Council	South Atlantic	administrator@safmc.net

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Nov. 2, 2023

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Nov. 2, 2023

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Attendee Report: SAFMC Nov. 2023 Habitat AP Meeting

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Webinar ID	Actual Start Date/Time	Duration	# Registered	# Attended
950-132-083	11/02/2023 07:24 AM EDT	8 hours 60 minutes	25	23

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