SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

HABITAT PROTECTION AND ECOSYSTEM-BASED MANAGEMENT ADVISORY PANEL

Webinar

April 14-16, 2021

Transcript

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Attendees and invited participants attached.

The Habitat Protection and Ecosystem-Based Management Advisory Panel of the South Atlantic Fishery Management Council convened via webinar on April 14, 2021 and was called to order by Chairman Anne Deaton.

MS. DEATON: First off, I would like to welcome everyone to our spring Habitat Protection and Ecosystem-Based Management Advisory Panel. It looks like we have pretty good attendance today. Since we've been doing the webinars, I'm trying to recall if we go around and do introductions, or a roll call. Do you want to, Roger, or do you want to just get it off of the attendee list?

MR. PUGLIESE: I think we've got it on the list. That may be the best. I think it might be a little tough to run through the whole group.

MS. DEATON: Okay. Well, I would just encourage everyone else to look at the attendee list, so they know who is on the call. Today, we have a three-day meeting, half a day today, a full meeting tomorrow, and then half the morning on Friday, and so it's a pretty full schedule, as usual. I just want to say thank you for coming, and we really appreciate getting the input from across the different states, whether you're a state agency or a federal agency or a research organization or a non-profit, and everyone has a little different niche of expertise, and it takes a village, and so please feel free to speak up throughout the meeting.

Today, we're going to start off by getting an update from Steve Poland, who is the Vice Chair of the council right now, but he's also the Habitat Committee Chair. He's going to give us an update on an overview of recent council action related to habitat and ecosystem and climate, and then, after that, Roger will be giving us an update on the different amendments that are under development by the council, and then we'll move into some reports on the work that NOAA has been doing related to the climate vulnerability assessment and the Southeast Ecosystem Indicator Report.

Then, finally, we'll get an overview and update from Rua Mordecai on the Regional Conservation Blueprints that are in existence, and so I'm going to leave that there, and that's all we're going to cover today. The next day, Thursday, we'll be getting into more of the policy and actions, FEP implementation actions. Before we start, and I turn it over to Steve, we need approval of the agenda. If anybody wants to add anything, or change anything, now would be the time to speak.

MR. PUGLIESE: Anne, real quick, just for everyone's information, for the session we have tomorrow, starting on the EFH policy statement, the first presentation, we have the representative from the U.S. Army Corps of Engineers making a presentation.

MS. DEATON: Nicole Bonine, yes, on SARBO.

MR. PUGLIESE: Yes, and she's going to be joined by Douglas Piatkowski. That is the only change.

MS. COOKSEY: Just to mention that, while Nicole is now part of the U.S. Army Corps of Engineers, she was one of the lead authors when she worked for the NOAA Protected Research Division, when SARBO was being developed.

MS. DEATON: Correct, and so that's not on the agenda, and so I guess that's an addition. All right. Other than that, any other changes? If not, then I say we can approve the agenda by consensus, and then do we have any comments or edits on the last minutes, which were October of 2020? If you don't know, and you want to submit those to Roger or myself, we can incorporate that, but we would need it fairly soon after the meeting, and so, if not, we can approve those minutes, again, by consensus. Okay. So we're good there. All right. Now we're ready to move into the actual agenda, and I'm going to turn it over now to Steve Poland to brief us on the recent council actions related to habitat and ecosystem.

MR. POLAND: Roger, if you will pull up the committee summary from the last meeting. Thank you, Roger, and thank you, Anne. Good afternoon, everybody. I'm Steve Poland, and I am the Chair of the council's Habitat Protection and Ecosystem-Based Management Committee and the Vice Chair of the South Atlantic Fishery Management Council.

Before I go through the report, I just want to thank everyone for joining us today. The council really appreciates the input that we receive from our advisory panels, especially the Habitat Protection and Ecosystem-Based Advisory Panel. There is a lot of expertise on this panel, and a lot of interdisciplinary expertise, and we always receive very good and thoughtful advice from you all, and so, again, I appreciate everyone taking some time out of their day for today, tomorrow, and Friday.

The council's Habitat Committee met back at our March meeting. During that committee meeting, we discussed Coral Amendment 10 and approved that amendment for public hearings, and we will be discussing that amendment again, and Roger can correct me, but I think it's at our next meeting in June, where we'll review the public hearing comments and move the amendment on through the process.

At this meeting, we also reviewed the FEP II Roadmap. We were actually scheduled to review it back in December, but we ran over on time in the committee, and we pushed this off until this March meeting. The committee had a good discussion on the FEP II Roadmap, and it was more discussion that looked at the FEP II Roadmap kind of in general and how it fits in the council's priorities and the council's ultimate mission of managing and conserving the marine resources in the South Atlantic region.

We provided some feedback to council staff and some guidance on kind of how we would like to see the roadmap kind of updated and move into the future, and there was some discussion by a few committee members who expressed a desire to see the roadmap to be brought more upfront, be brought more into management conversations, and, basically, take what's in the FEP II Roadmap and the input received from the Habitat Committee and put that into an operational form.

There was general support for a lot of the policy statements developed in the FEP II Roadmap, and those policy statements rely very heavily on the input we receive and the work that you all do here at the AP. The policy statements are very useful in supporting council comments and coordination with the partners, and the committee was supportive of continual development of those policy statements.

Then, lastly, we had a committee discussion on the Habitat and Ecosystem Program Blueprint, and I think there is an agenda item to talk about this later in the meeting, or is there not, Roger? I can't remember. I don't think there is, and so I'll go into a little bit more detail.

MR. PUGLIESE: We're going to talk about the FEP II tomorrow.

MR. POLAND: Okay. Then I won't go into too much detail then, but the committee discussed the program blueprint and provided some additional guidance to the Habitat and Ecosystem Program Blueprint Working Group, and, in general, the committee is very supportive of this blueprint initiative.

Basically, the committee recognizes the value of our habitat program, all the partners that we have, all the expertise that we have that have contributed to the very broad and vibrant habitat program that we have here at the council, and we want to go through this program blueprint process to ensure that the information that we have and the habitat initiatives that are being developed within our habitat program at the council -- That we're using them effectively to achieve our council mandates, specifically those in Magnuson for EFH and consideration in fishery management plans.

The goal of this blueprint is to look at the habitat program holistically, and also provide some future planning, and so, basically, what the habitat program is currently doing, what products they provide, and how we need to think about the habitat program and move the habitat program into the future, over the coming years and decades, acknowledging that there are new emerging issues that we're dealing with and still issues that are left to be dealt with. The committee is supportive of that process, and, like Roger said, we'll go into a little bit more detail later in the agenda.

Then the committee discussed the AP agenda items that we're here today, tomorrow, and Friday to discuss, and that was the conclusion of the committee. With that, if anyone has any general questions that I might be able to provide a little bit more council perspective on, I will take them now. Cindy, I see you have your hand raised.

MS. COOKSEY: If the screen could go back up a little bit, to show page 2 a little bit more, under the Habitat AP bullet item, you were mentioning looking forward to habitat moving into the future and coming at it from a very holistic viewpoint, but I was quite struck by the final bullet, where it mentioned splitting habitat from ecosystem and climate activities, which I don't know if that was a miswording or if that was an actual concept that was put forward, and I'm curious how the council thinks to split habitat from ecosystem and climate activities while still having a holistic approach to habitat and moving forward into the future. Thank you.

MR. POLAND: Thank you, Cindy. That was a concept that was brought up at the committee meeting in March. Really, the idea behind that is we're starting to receive requests and mandates, through various Executive Orders, to consider climate change and climate resiliency in our management. The discussion that we had in March, the committee felt, and the council felt, that, since the issue dealing with climate change, climate resiliency, touches on so many aspects of fisheries management, and not just issues related to habitat, but also issues related to governance and monitoring and assessments and such, and we floated the idea of potentially creating a stand-alone group to advise us on various climate activities and climate initiatives.

I wouldn't necessarily say it's a splitting of the baby, per se. It's just there's so many other issues that fall under that umbrella of climate activities, outside of habitat, that the committee and the council wanted to consider if there were better ways, or if there was a better way, to structure that discussion, but at no point will the habitat aspects of climate change be excluded from that conversation. It was more just a desire to see if we can kind of wrangle those in and group those together a little bit better, to get at a more complete discussion and complete picture.

MS. COOKSEY: Thank you for that. That clarifies it a little bit. I would just be very cautious in any splitting that occurs, given the fact that climate change is an issue because it is changing the habitat, and so I'm not -- Like I said, I'm not 100 percent certain how you can effectively disengage those two items and still have a holistic approach to ecosystem management and habitat management, and so that's just something to think about.

MR. POLAND: Thank you, Cindy. Wilson, go ahead.

DR. LANEY: Thank you, Steve. Basically, I will just say what Cindy said. I share the concern, and I certainly recognize that climate change and ecosystem considerations are overarching over all of the council's FMPs, and there's no doubt about that, and they also are overarching over -- Well, at least the climate change aspects are certainly overarching over the social and cultural aspects of the council's responsibilities as well, and there's no doubt about that.

The ecosystem, the Ecopath modeling, is a little different, I think. I think that originated within the Habitat AP, and Roger has certainly been instrumental in birddogging that and in seeing through the development of the Ecopath model, for sure, and the very close and collaborative working relationship that we have with Rua and South Atlantic LCC, but also with the Florida Fish and Wildlife Conservation Commission and their staff people who have poured so much into that, and so I would very much strongly encourage a continued presence of the Habitat AP in both of those arenas, and certainly in the ecosystem arena for sure.

I know that the SSC is going to be getting at least more engaged, probably, in the Ecopath modeling, because they did put together the model workgroup, and they reviewed it, and they basically -- At least my perception, and you tell me if I'm wrong, Steve, but my perception is the SSC reviewed it and made their comments on it, and it was modified in response, and they basically certified it for use in deriving management insights, at least, and so I think there still needs to be a very strong engagement by the Habitat AP in all three dimensions, and I agree totally with Cindy that it's going to be -- I think it would be a challenge to keep things holistic if you totally divorce the Habitat AP from climate change and ecosystem aspects of the council's program, and so that's my two-cents' worth. Thanks.

MR. POLAND: All right. Thank you for that, Wilson.

MS. DEATON: Steve, if I could just add, the concern I would have with moving those over is that it would be even more focused on just fish, and no offense to fish people, but, even within us discussing it, and we have the policies, and we have a committee of experts on ecosystem management on this committee, reports tend to be focused on how it affects the fish, and that's a continuing challenge for habitat protection, that we don't have as much monitoring to even make those assessments.

There's not as much monitoring for habitat across the South Atlantic, and, as Cindy said, the habitat is the root of the issue. The habitat issues will cause the fish change, because we include water column as a habitat, and so, as temperature and salinity change, and as currents change, that will affect fish, but, if you lose SAV, you're going to lose recruitment of juvenile fish, and you lose oysters, and the same thing with different fish, and you will lose that recruitment. The system overall is impacted, and I just -- Whatever group -- Wherever it sits, you need to have both elements discussed and addressed, and that would be my request.

I think the ecosystem assessment that NOAA -- That we're going to hear about later, and it's a little bit light on habitat, for reasons, valid reasons, but, to me, ecosystem is about the habitats and the fish integrated together and how they influence each other.

MR. POLAND: Thank you for those comments, Anne, and I just wanted to make it clear that the committee hasn't moved forward with endorsing any broad changes yet to our habitat program, or to our AP. This is part of the program blueprint process, where we're working through these ideas, and, ultimately, that blueprint will be presented to the committee, but it will be presented to the AP prior to being presented to the committee, and so there will be ample opportunity for that input into the process, but we're just at the beginning stages of figuring out the scope of work and working out kind of broad ideas, before we get down to the actual nitty-gritty and actually applying this, or potentially applying this, to our habitat program, but I do appreciate these comments today. Paula, I see you have your hand raised. Go ahead.

MS. KEENER: Thank you. I just agree with all that has been said here. If the council -- If the council is taking the ecosystem-based management approach in all that it does, and the committee structure and workgroup structure needs to reflect that, and so I just support everything that has been said here. Thank you.

MR. POLAND: All right. Thank you. Any other questions? Anne, that's all I have for the council update.

MS. DEATON: All right. Thank you very much, Steve. With that, I guess we will move on to the next agenda item, which is Status of Amendments Under Development by Roger Pugliese. Go ahead, Roger.

MR. PUGLIESE: Okay. I'm just going to give you a verbal update on kind of the main areas that are moving forward under each of the FMPs the council is operating. First of all, Snapper Grouper Regulatory Amendment 34 was advancing the development of special management zones off of the State of North Carolina and then adding a number off the state of South Carolina. The amendment was submitted, and the final rule was just published on April 2, with an effective date of May 3, 2021.

There is an Amendment 48 that is moving forward that is a wreckfish ITQ modernization program, and that is really to look at -- It's an opportunity to look at actions relative to electronic monitoring, and even potential consideration of VMS into the future, and the council will be reviewing draft actions and alternatives and approval at the September council meeting. In advance, I think the wreckfish shareholders will actually be convening, later this summer, to provide additional input.

Amendment 50 is specific to red porgy. There was a stock assessment 60 that was done, SEDAR 60, on red porgy, which found it to be overfished and overfishing occurring. Scoping hearings were held on February 3 and 4 this year, and the council will review the updated analysis at the June meeting and approve the amendment for public hearings.

Amendment 49 addresses greater amberjack catch levels and allocations and the snapper grouper recreational annual catch targets. That is moving forward through the process, with scoping hearings held tonight and tomorrow, the 14th and 15th. In June, the council will review those comments and comments from the Snapper Grouper Advisory Panel, which also will be meeting, and any preliminary analysis, in advance of that for the development of the amendment.

Under dolphin wahoo, the Dolphin Wahoo Amendment 12, which addressed the bullet and frigate mackerel as ecosystem component species, and this AP had input on that, has advanced, and it is moving forward. In March, the council reviewed public hearing comments and approved edits, and it is advancing this to prepare an amendment for a potential vote for approval during the June council meeting.

Under coral, I think Steve already touched on Coral 10, and that amendment went to scoping on February 8 and 9 of this year, and it will be going to public hearings soon, on May 12 and 13. At the June council meeting, we'll be looking at reviewing those comments and addressing the actions, with final approval scheduled for September of this year.

Under mackerel and cobia, Amendment 34 is addressing king mackerel assessment and allocations, and, at the June council meeting, the council will be considering selecting preferred alternatives for public hearings. Amendment 32 addresses the Gulf cobia assessment and allocations, and, while it's focused on the fact to end overfishing of the Gulf cobia, the South Atlantic is including an action to revise the Florida East Coast Zone, based on updated recreational estimates, and they will review that analysis in June and select preferred alternatives, and also consider approval for public hearings.

The last one is really one of the generic amendments, the Comprehensive ABC Control Rule Amendment, and that is moving forward considering providing flexibility under the Magnuson-Stevens Act to revise how uncertainty and risk and tolerance are addressed in the setting of ABCs. The council reviewed part of that at the March meeting, but, in June, they will receive additional comments from the SSC and the remainder of the actions and provide further guidance on further development of the amendment, and those are the broader amendments that are significantly in process, or moving forward, and that's all I have for that.

MS. DEATON: All right. Roger, thank you. Are there any questions? Paula, go ahead.

MS. KEENER: Thank you. Roger, thank you for that update. I have a question regarding -- Please don't roll your eyes when I say Coral Amendment 10. I know that we had our meeting back in the fall and that the council has already moved this to public hearings, but I am interested to know -- After we had our meeting in the fall, our recommendations were sent via a letter, and is that correct, to the other two APs for consideration in their deliberations, and is that correct?

MR. PUGLIESE: The report from the panel, and it was highlighted what the AP had identified, yes.

MS. KEENER: So that was the Coral AP, correct?

MR. PUGLIESE: Yes, the Coral and the Deepwater Coral AP deliberated together on the activities.

MS. KEENER: Okay, and can you just give us a quick brief on what the outcome of those deliberations, or reviews, were, related to what our AP recommended?

MR. PUGLIESE: They reviewed the issue and focused on their individual recommendations. The Coral Advisory Panel essentially recommended that there be status quo, not create a shrimp fishery access area, and the Deepwater Coral Advisory Panel recommended the action that had been recommended back in 2014 as their recommendation, versus the previous alternative.

Under the coral deliberations, one of the concerns had to do with the potential buffer from the area or the possibility of sending plumes, et cetera, to the area, and so that's kind of the core that we brought forward. The specific report from both advisory panels, and all three advisory panels, were provided to the council committee and council, and that's what advanced refinement of the document, advancing toward public hearings for additional input.

MS. KEENER: Okay. All right. So what is being advanced now for the public hearing is just to -- It's to allow access, as requested by the industry, correct?

MR. PUGLIESE: Yes, the smaller of the two areas that were proposed. Yes.

MS. KEENER: Right and that does not include consideration of a buffer, right?

MR. PUGLIESE: Well, a separate --

MS. KEENER: Unless it is requested or discussed or put forward, and so, after the public hearing -- What happens after the public hearing? Those comments by the public are taken into consideration, and then what? I'm sorry, but I'm just new to this process.

MR. PUGLIESE: That's no problem, and Steve can weigh-in here too on this, if you would like. The system, the way it operates, is that the council will consider the comments provided and have the opportunity to refine and address and adjust the measure as they feel addresses the intent of the action, and they have given enough time to -- The idea is to approve the actions, but provide the ability to refine the document, and then with the ultimate approval occurring at the September council meeting, and so there is time for deliberation and review by the council in June and then refinement as it moves into any finalization. I think that's pretty much it. We're in that mode right now.

MR. POLAND: I mean, you captured it, Roger. Now we're just in the amendment development process, and so the council did select the preferred alternative, and I think it was Alternative 2, at the last meeting, and moved it on for public comment. That public comment period -- I don't know if the hearing is scheduled yet or not, Roger, and I don't have my calendar in front of me.

MR. PUGLIESE: Yes, and the hearings are May 12 and 13.

MR. POLAND: So, on May 12 and 13, we'll receive public comment, and then the council will consider that public comment in June, and, based off of that public comment and the desire of the council, either continuing moving the amendment forward or make modifications to it, and the timeline now has it for final action in September, and so there will be two more council meetings where the amendment will be discussed.

MS. KEENER: Okay. Thank you. Thank you for that information. I was interested in what the other two APs had put forward, and I was on the line during the council meeting, and so I heard the conversations regarding their decision moving forward into the public hearing, but I had not heard anything regarding the -- Or I missed the information on the decisions for the other two APs, and so I appreciate the debrief. Thank you very much.

MS. DEATON: Okay. That's a good point, and that's just reminding us what is the outcome of things after we discuss and have written comments as an AP, and sometimes they have to balance other issues. Wilson has his hand up. Wilson, did you want to say something?

DR. LANEY: Well, just thanks to Paula for asking that question, and I will just say that I still have concerns, even though I realize that it's a very narrow corridor that the deepwater shrimp community is asking be opened up to provide access.

Personally, from my perspective, I think that the initial design took a lot of the deepwater shrimp desires, with respect to access, into consideration, and, also, it took into consideration the need to have an adequate buffer against the coral to preclude any unintentional impacts to the coral, and so I'm still concerned. Certainly I think the Coral AP's recommendation is a sound one, to stick with status quo and not reopen that area to any shrimp harvest, and so that's my perspective on it. Thank you, Madam Chair.

MS. DEATON: Thank you for the comments. Are there any other comments, before we move on? All right. Then the next item on the agenda is NOAA Fisheries Ecosystem-Based Fishery Management Activities for the South Atlantic Region, Deliverables Supporting FEP II Implementation, and so Michael Burton from the NOAA Fisheries Lab is going to speak first, following by Kevin Craig. Michael, if you're ready, we're ready to hear you.

MR. BURTON: This is just going to be a real brief update over basically what I gave back in October, and so this an update on the Fish Climate Vulnerability Assessment that we started I don't know how long ago now, and it's been a while, but this is a priority of the NMFS Climate Science Strategy, and that's the main reason we're doing it, I guess, but it's a forward-thinking document put out about six years ago, I think, and it lists, as you can see, the CVA, ecosystem status reports, development of regional action plans to customize climate research in each region. That Number 5, I'm working on that as well, and so this, as I said, is a forward-thinking document, and it's getting more traction in the current administration, and so things are looking up for climate research.

All of the climate vulnerability assessments, and there's been several completed in different regions around the country, in the Northeast, Alaska, the Pacific Islands, and they're either done or nearly done. The Gulf CVA is in the process of -- Either the writing is being finished up on it or it's in review right now, and they've just completed all the analyses on that, and they all use the same methodology, the same template, which was put out in this Morrison et al. document back in

2015, and so everything is very standardized across regions in the way that they did the CVAs, and I think NMFS has plans, eventually, to do a CVA in the Caribbean, but we just haven't gotten to that right now. We're busy, in the Southeast, with both the Gulf and the South Atlantic.

Briefly put, a CVA, or climate vulnerability assessment, is a tool that determines the likelihood that the productivity, abundance, or distribution of a species will be affected by a changing climate, and so there's some nice graphics, just to show you.

The basic way that it works is that each species is scored by a panel of independent expert scorers as to both their biological sensitivity and their twelve life history attributes that were scored as to their sensitivity to climate change, as well as seven climate factors, such as sea surface temperature, salinity, et cetera, as to their exposure, their vulnerability, to changes in those environmental factors. The products of those scores result in an overall vulnerability rank, and you can see low, moderate, high, and very high.

The final vulnerability scores were an average across the scorers that did those same species, and so seventy-one species, and we had an expert panel of about sixteen or so panel, and I believe that each scorer got somewhere between fifteen and twenty species to score, and so it was a busy time.

We gauged, or assessed, uncertainty in the final vulnerability scores using a bootstrap analysis, and, when we get to the vulnerability matrix, I will show you how that played out, but it's basically that was used to find species that were on the borderline between two vulnerability ranks, and it could have gone either way.

In addition to overall vulnerability to climate change, we assessed the potential for each species to change their distributions, and this finding was based on the rankings for four of the twelve sensitivity attributes. As you can see, it's adult mobility, larval dispersal, habitat specificity or generality, and sensitivity to temperature, and these are the four sensitivity attributes that were thought that would lend themselves -- If a species was adaptable to these things, it would be more likely to be able to change its distribution or expand its range.

Finally, we looked at what was just basically called directional effects of climate change, and this is not as intuitive as that title sounds, and we were basically asking the scorers to just determine whether the overall impacts of climate change on that species were expected to be positive, neutral, or negative, and so it doesn't really have the meaning of direction, in terms of north, south, east, or west, but whether it be positive, negative, or neutral, and, again, each species was scored by multiple experts. All of these scorers were spread across the categories, so that there wasn't a build-in for uncertainty in the scoring.

Quickly, you've seen this before, but I think I've made it a little bit bigger, and it's easier to read. This is the overall vulnerability matrix, and so exposure is across the bottom, low, moderate, high, and very high. The rankings for sensitivity attributes are across the top, and so green is low, yellow is moderate, of course, and red is very high exposure. You can see that most everything, almost everything, was in the very high category, with the exception of -- Well, even Atlantic and Gulf sturgeon was very high, and everything was high, exposure-wise, and only sturgeon was not very high, in terms of that, and so it was -- We were surprised by this. This was different than what they found in the Northeast, by a little bit, and I will get into the reason for that in just a minute.

As far as the bootstrap analysis, which judged things on the border, you can see that things that are in italics were -- The bootstrap found that the likelihood is that they were going to be one vulnerability rank lower, and so, if you look at the red, all the way over the light blue line and golden tilefish, as well as hogfish and striped bass, it could easily have slipped down from the very high into the high vulnerability category, based on the bootstrap analysis.

I just want to quickly give you an overview of what the data runs on some of the exposure factors found, and this is why -- This is an explanation as to why everything pretty much came out in the very high category in the Southeast.

Temperature is not a surprise. The graph in the upper-left is just a future climate prediction, whereas the upper-right graph is the anomaly, and that is the historical -- That is the projected future minus the historical, and so, if you look at that, you can see that, off of Florida, the Florida peninsula, it looks like the projected increase in sea surface temperature is going to be somewhere between 3.6 and four degrees Celsius, and you can follow that up the coast, and so the prediction for sea surface temperature is a little dire. Even up in the Carolinas, it's up in the two-and-a-half to three category up there.

The same thing on salinity, and this is the unexpected factor that we didn't see anywhere else. Salinity, nobody -- They didn't get a strong salinity signal in the Northeast, and they didn't get it in the Gulf of Mexico, and we got it here in the South Atlantic, and you can see, looking at the right figure, that salinity, especially off the Carolinas, is projected -- If you look at the anomaly graph in the upper-right, it's projected to be between two-and-a-half and three parts per thousand, I guess, above the historical norm, and so that led to some high vulnerability scores, and I will touch on that, briefly.

Then, quickly, this was the third exposure factor that, in most of the species rankings, rated fairly high in vulnerability, and this is pH, or ocean acidification, and so you can see that the projections for future versus historical is not too bad along a lot of the immediate coastline, but there's some differences. I mean, if you look at the left-hand graph, and look close to the Florida Peninsula, you can see that the pH is a little bit lower there, and so there is a projection in the data that was downloaded as to decreasing surface pH, and a lot of the individual scorers thought, in their judging of the effects on various species, thought that came into play as well.

So why the salinity thing comes into play more than we thought it was going to happen is there's a rule built into the vulnerability procedure that, if you have any three exposure factors that have a very high ranking, then automatically the overall ranking of the species is very high, and you can't override that.

It's built into the methodology, and so, with these three things, we almost always had a very high ranking for exposure, because temperature, and a lot of times pH, was judged as very high. Salinity, we weren't expecting, and so this is the main difference, I think, between our results and the Northeast, because the Northeast had no salinity signal, which drove the rankings to very high for everything. That's just a brief touch on vulnerability, and we're working through the writeup on that and everything right now.

A quick look at potential for species distribution, you can see that most of the -- The majority of the species are either -- Dolphin is very high, and clearly it's highly mobile with a high larval

dispersal, and it seems to be a habitat generalist, because it's open ocean, and so it's going to be very high. A lot of the other species are high. The majority of species are either high or very high potential for species distribution.

The things that are in the low potential for species distribution are things that you might expect, like some of the invertebrates, the more sessile things, like oyster, some of the anadromous species that are tied to particular places, and so more things to look for.

Then the overall direction effects, or the overall positive, neutral, or negative expected effect of climate change, these fish -- It's somewhat positive, I guess, in that the majority of species are either positive or neutral, expected to be affected either positively or not affected at all, or greatly, by climate change, and, again, the things that are negative, expected to be affected negatively, are more the anadromous species, invertebrates, and things that really aren't expected to -- Well, they're just -- Things like snowy grouper is kind of a mystery, but we're going to have to dig more into the data and the scores on that, because you wouldn't expect a deepwater thing like that would be affected, and certainly not by sea surface temperature, but it could be other productivity issues, ocean circulation issues and things like that.

This is just a look at the climate vulnerability, basically to show you how the species are spread not only across vulnerability ranks, but across management jurisdiction, and so the federal -- The things that are managed by the council, with a federal fishery management plan, are represented by the blue bar, and the brown is things that are more or less covered by ASMFC in an interjurisdictional plan, and then the orange bar are either things that are covered by states or just things that are not covered in a management plan at all, and these would be things like pinfish or slippery dick or forage type fish, things like that, that we included because they're part of the ecosystem and stuff, and so a pretty good spread across both vulnerability rankings as well as management jurisdictions.

Quickly, just some key points, which I just touched on, is the most impactful exposure factors are sea surface temperature, salinity, and ocean acidification. Sea level rise was another one that came into play with some things, and drove some of the scores, but, as I just showed you in that previous graph, there are twenty-two species that scored very high, twenty-four high, and twenty-five moderate.

The highs were generally anadromous species, invertebrates and some of the deepwater demersal groundfish. Coastal and reef fishes made up the bulk of the high species, and then the moderates were pelagics, forage species, coastals, and some reef fishes spread across management jurisdictions, and so the distribution change -- The majority have either a very high or a high potential for change, and, directionally, the overall effect of climate on the species, the majority of species are either positive or -- They're expected to suffer either positive or no effect on climate change.

The ones expected to be impacted most adversely by climate change include anadromous species, invertebrates and some of the deepwater demersal fish, and I would point out that the CVAs are intended to be conducted iteratively, and so, after this one is done, I expect that, as part of the NMFS Climate Science Strategy, it will probably be repeated at some point, in maybe three to five years, and I expect that, eventually, it will be tied into the timing of the regional action plan, which we're working on that right now, the update on that.

Then, just briefly, to touch on the salinity thing, I asked one of the contractors who was working with me on this, because he was sort of bamboozled by the fact that salinity was projected to change as much as it was, and so we bounced it off some people at some of the environmental labs within NOAA, and this explanation is the one that was given, is that climate change is predicted to enhance the global water cycle, so that wet regions will get wetter and dry regions dryer, and so subtropical ocean regions are dry to start with, and you wouldn't think that, but they're talking about precipitation. They're projected to warm, and that will lead to enhanced evaporation, and that could lead to an increase in salinity, and so, anyway, that's one explanation. If the climate continues to warm, then salinity is going to be affected.

Remaining steps in this process, I'm working on completing the species narratives and writing the manuscripts, and there is a final report pending. I am loath to give a final projected deadline on that, but it will be this summer sometime, and I am sure of that at this point.

Then the million-dollar question that I was sort of asked to address is how can this be used by the council, and so we bounced this question off some colleagues up in the Northeast that have a little more experience in this kind of thing than us, and so, basically, what it comes down to is risk assessments, like a climate vulnerability assessment, can be used to prioritize an ecosystem approach to fisheries management and analyses, as well as research plans for future years, and that's covered in this article that is linked right here.

Then another effort that seems to be ongoing that this could be used by is something that -- It seems like there's a multi-council, multi-region, effort going on right now called the East Coast Climate Change Scenario Planning Effort, and I believe Roger is part of that, part of the core team, but an example from that is that the Mid-Atlantic Council will use ecosystem status reports to identify indicators for what they call risk elements, and there were five categories of risk elements that I have listed there.

Within ecological risk elements, climate was listed as one of the indicators, and what they did up there is just directly apply those vulnerability rankings from the CVA into the like climate risk score for that risk indicator exercise, and that whole effort is explained in this other article that I have linked at the bottom, and so I am not going to tell the council or their AP what they should do with the CVA, but these seem to be some things that have been done in other regions, and so that's all I have for now, and I would answer any questions, or I will try anyway.

MS. DEATON: Thank you. That was really good. Are there any questions?

MR. BURTON: Stunned silence.

DR. BAUMSTARK: Thank you very much. That was a great presentation, and it's very important work here. You mentioned, at the very start of your presentation, how the change in administration has created, I assume, possibly a more conductive work environment in NOAA, and I think this is particularly important with climate change, and it might be that, this being a vulnerability assessment, and I'm not necessarily pointing fingers, but I'm wondering, in general, how --

Especially now, as you're getting into the final reporting part, but do you feel like this changing administration, or this new environment that you're working in, or maybe it's not affecting you at

all, but will this give you the ability to be more blunt in the way you report out your findings, and it might be that you're not going to be proposing anything very dramatic, given this is just an assessment, but I think there is some clear need for expressing urgency on some of these topics, particularly how you assess future scenarios, if you're weighting the influence of change heavily, or how you model your future efforts, and I'm just wondering how those things played in and if it's changing the way you guys are going about doing this in any way.

MR. BURTON: I don't think it's really going to change what we present as the results, because the science is the science, and we're always going to be sort of subject to policy filters down at the Southeast Center before anything goes out, and so we're not supposed to make policy statements, but, I mean, if the science says it, then we're going to say that that's what the science says, I think, if that answers your question.

DR. BAUMSTARK: Sure. I think of a lot of different efforts, in our state anyway, where we try to do what we do under the radar, and that's a very different way, and I think a big part of what you also need to do is communicate, but I agree that, if we're sticking with the science, then that keeps us sheltered from the politics. Thanks.

MR. BURTON: Sure. Thank you.

MS. BROUWER: There are several hands raised. I realize you can't see the document, Anne, and so the next up is Paula.

MS. DEATON: Thank you. I was wondering where that went.

MS. KEENER: Thank you. Michael, thank you for that excellent presentation and very powerful document. I had a quick question for you. I'm wondering if the availability or the sensitivity of the prey organisms to climate change, with potential migration of the actual prey of some of these organisms, and, again, not knowing what stomach analyses have been done, and I know that those studies are limited, but was that taken into consideration? For example, if the prey moves, how some of these species might move as well, in response to the changes in climate.

MR. BURTON: It's just hard to know. I think that sometimes -- I mean, if there was clear evidence, or if there was like a clear reporting of that being a possibility in the literature, because the scoring was all done using species profiles that we developed that were essentially just sort of expanded literature reviews, and so, if some of that stuff had been reported in the recent literature, then it got put into the species profile, and hopefully the scorers used it to that effect.

I guess one example, and not so much as predator/prey, but the effects on prey, is, in a lot of these things -- Like ocean acidification would have been factored into the effects of ocean acidification on prey items of a given species we were scoring, and so like, if a preferred prey item was subject to ocean acidification, then that would, up the line, affect the productivity of that species, and so that would be factored into the score.

MS. KEENER: Okay. Thank you. Then the other comment is that this type of data -- It's important, as you well know, to keep it updated and then, also, as you pointed out, I think it's critical that it would cross-reference with all these other different initiatives that are taking place at the regional level. Then, also, because this is also a global issue, looking at some of the

international studies and reports that are coming out related to some of this and looking at how this might shore up against some of that data as well, but thank you very much for your efforts with this.

MR. BURTON: Sure. Thank you.

MS. DEATON: Wilson.

DR. LANEY: Thank you, Michael. The question is, when you all get a draft completed, do you plan to send that back out to those of us who were on the CVA scoring panel, to take a look at it as well, once you have a draft?

MR. BURTON: I do indeed. You will all be authors, and so, yes, I do indeed.

DR. LANEY: Okay. Thanks. I figured that would be the case, and so I will be on the lookout for it, and you said probably sometime later this summer, you think?

MR. BURTON: I hope so. I have lost some of my help, but that's my plan.

DR. LANEY: Understood. I think this pandemic has slowed us all down a good bit.

MS. DEATON: Todd, did you want to say something?

DR. KELLISON: I do. Thank you, Michael, and maybe I will try to say a few things, and so stop me if I go on too long, but I was just going to maybe add to Mike's response to a couple of questions, and I will start with the last, in terms of the timing of the CVA. I guess what I wanted to say is it's a priority for us to get that out, and so I think, thanks to Mike, we are very near the end, and I think the analyses are all completed, and it's just a function of writing, but it is a priority to do that, and so hopefully -- We all want to see it out as soon as possible, and so I wanted to note that,

In terms of -- Forgive me if I get the name wrong, but I think Rua's question, and I just wanted to note my perspective, which is that, under the previous administration, I don't think that we at NOAA, or at least within the work that we do in the Southeast Fisheries Science Center, that we were constrained at all in our ability to focus on climate or to communicate results related to climate, but I would say that I think that probably the encouragement for climate-related work, and potentially, or perhaps probably, resources to support climate-related work will increase under the new administration. While I don't feel like we were previous constrained, we may be further encouraged and able to be more productive, moving forward.

Forgive me again if I'm mismatching names, but I think Paula's comment about integrating this type of like the CV output with other information -- The examples that Mike gave that the Mid-Atlantic Council has pursued, the risk assessment and the scenario planning that's underway, both of those type of activities do exactly that, and so they try to consider all the available information, and so, if they were to pursue the South Atlantic -- Activities for the Southeast Atlantic, or the South Atlantic, the CVA would be one source of information, and the ecosystem status report and the information contained in that that Kevin will talk about after this discussion ends will be another component that would be important to those kind of activities.

Lastly, I wanted to note -- Mike mentioned that these climate vulnerability assessments are meant to be iterative, and they're meant to be updated. The ecosystem status report that Kevin will talk about is the same way, and they're all meant to be updated, but there's also a new player that's coming onto the scene, and the NOAA Fisheries Northeast Fisheries Science Center has been working to complete a habitat climate vulnerability assessment, and I think that process is complete, and they are preparing a document, like a final report. I anticipate that they will publish that in a peer-reviewed manuscript, and so that will be another potential tool for us to pursue, to provide a greater perspective on how climate is affecting our ecosystems, and so I will stop there. Thanks for the opportunity to comment.

MS. DEATON: Todd, thank you. Who did you say is doing the habitat CVA?

DR. KELLISON: The NOAA Fisheries Northeast Fisheries Science Center is the lead on that.

MS. DEATON: Okay. Thank you. All right. I don't see any more hands raised. Does anybody else want to make a question or a comment? Wilson.

DR. LANEY: Thank you, Madam Chair. I've got one quick one. Todd, you may have said previously, in a prior AP meeting, and I don't remember, but is the South Atlantic also planning to do a habitat vulnerability assessment as well?

DR. KELLISON: Thanks, Wilson. That is a great question. Right now, it is not something I think that's in our immediate future, and it's not -- Like the climate vulnerability assessment, or generating regional action plans that Mike mentioned, or developing ecosystem status reports, it requires effort and resources, and so I anticipate that, once the Northeast habitat CVA is completed, that will be a discussion that we'll have in the Southeast Center, and probably within the other centers within NOAA Fisheries.

I don't think that it's part of the NOAA Fisheries Climate Science Strategy that Mike mentioned, but the habitat climate vulnerability assessment might be something that comes out of the -- Mike mentioned that the Southeast is trying to update its Climate Regional Action Plan, that all the regions within NOAA Fisheries are doing the same thing, and so that might be sort of a broad piece of guidance that comes out of the update of all the regional action plans, and so that could be something that's on our plate, but, right now, it's not determined.

DR. LANEY: Okay. Thanks, and, again, I will just say that it would seem, given that the Northeast Region has already done one, and given the results of the CVA for the Southeast that Mike presented to us a few moments ago, and thank you, Michael, for that report, and given the distributional changes that we're already seeing occurring, it would sure be interesting to do a habitat CVA in the Southeast, given the high percentage of species that wound up in that very high or high category, and so maybe that's something that you all can have some further discussion of as you update your climate regional action plan.

DR. KELLISON: Thanks for that, Wilson. I definitely anticipate further discussion, and I also anticipate that any input from our partners -- That they will value that kind of information, and it might be -- It would be definitely considered by the Center as well, in determining how to proceed with those,

MS. DEATON: All right. I see that Cindy has her hand raised. Cindy, go ahead.

MS. COOKSEY: I'm going to take Wilson's comment and actually take it one step further. Not only do I think it would be interesting to see a habitat climate vulnerability assessment done for the Southeast, but I actually think it's critical that that be identified as a future priority for our area and something that maybe we work towards, as an advisory panel, to see that kind of raised up as an item of importance in planning for future efforts that we need done in the Southeast. I think that report that we just had presented today just really highlights how this needs to be, or why this needs to be -- The habitat component of the CVA needs to be the next priority area for our region. Thank you.

MS. DEATON: Thank you, Cindy. I see several more hands now, and I think we can take a few more, and then we should probably move on, but then there's discussion after Kevin. Laurent.

DR. CHERUBIN: Thank you, Madam Chair. A question for Michael, and I think it's more of a technical question, and so the focus is on sea surface temperatures, but we know that the habitat is basically mostly benthic or some of the water column, and I wonder if there is any intention, or information, that also provides changes in bottom temperatures, which is I think where the impact will be most significant, and we know that sea surface temperature can increase, but not necessarily affect the bottom temperature, depending on the stratification and those things, and so I wonder -- If you start looking into bottom temperatures, you may see a different pattern, in terms of vulnerability.

MR. BURTON: I think that's probably true. We just kind of followed the lead of the previous regions and used sea surface temperature, and I guess the way to look at it is that, for those deepwater species, we were just using sea surface temperature as a proxy for bottom temperature, and I know that's not very satisfying.

Bottom temperature is, I believe, one of the environmental variables we could picked from the portal, but that wasn't the guidance I got, and I believe that that would have greatly reduced the number of climate models that were able to run for that particular variable, because each environmental factor was only included in a certain number of climate models. Like sea surface temperature was included in twenty-six models, and I think salinity in thirteen, et cetera, et cetera, but, yes, I agree that it certainly would have more of a bearing on things like tilefish and whatnot, and so maybe in a future run, I hope.

DR. CHERUBIN: I am just thinking that the -- If you were planning on making decisions, as you showed at the end of your talk, like how this information can be used in actual actions by the council, and you may introduce a little bias into -- Influence decisions in a way that didn't need to be influenced, and so that's why I would -- I am wondering if there's not a way to also have a sort of like assessment that includes bottom temperature, that could actually compare, so that you can say, well, there's not a big difference, and so we can keep working with sea surface temperatures.

MR. BURTON: That's a good point.

MS. DEATON: All right. Paula and then Todd.

MS. KEENER: Quickly, I don't know the ins and outs of the models that were run, but, in looking at the species, many of them overlap with the species that are in our area, and so it seems like it would be not -- I am going to say this tongue-in-cheek, but not a big lift to do something like this for the Southeast. Maybe a graduate student project or something like that, and so I will just leave it at that, but I completely support doing that. Thank you.

MS. DEATON: Todd, did you want to add something?

DR. KELLISON: Well, I had originally forgotten to lower my hand, and I have done that now, but, since you put my name on the list, I will just respond to Laurent's question, which is -- I don't think that was considered in the CVA, as Mike indicated. Kevin, in the next presentation, will give some information on at least historical up to recent trends and the metrics that were included, sea surface temperature and bottom temperature, so we can at least get a look at how those two have been related.

DR. CHERUBIN: Sounds good, Todd. Thank you.

MS. DEATON: Myra, did you have that question to pass along?

MS. BROUWER: Yes, there was a member of the public, Mike, that had a question for you, and I recommended that they email you directly, since we're pressed for time, unless you would like me to unmute that person, Anne.

MS. DEATON: I think the email is fine.

MR. BURTON: That will be fine. Sure.

MS. DEATON: All right, and we just had a great segue to the next presentation, which I believe Kevin Craig is doing, but I have on here you too, Todd Kellison, and so I didn't mean to leave you out. Is it going to be Kevin or both of you?

DR. CRAIG: It will be me.

MS. DEATON: Okay. All right. Go ahead.

DR. CRAIG: Thank you. This is going to be an update on the U.S. South Atlantic Ecosystem Status Report that has been under development for the last year or two, and it's going to build on some of the information that we discussed at the last AP meeting, I believe last October.

We have a number of people involved now as editors or co-editors on the report. There is myself, Todd Kellison, and Samantha Binion-Rock is a post-doc in the lab who has been instrumental in moving this effort forward. We also have Seann Regan, who is with the National Ocean Service and is leading a lot of the indicators, with respect to human dimensions, and then Mandy Karnauskas, who is the Ecosystem Science Lead for the Southeast Fisheries Science Center.

Just by way of outline, I'm going to touch on three topics. What is an ecosystem status report, just to sort of remind folks, and these are relatively new, particularly for our region, and I will give a brief overview of the current state of the ecosystem status report for the South Atlantic, but I want

to focus a bit more on Number 3 here, how can these potentially be used, and build a little bit off of what Mike ended with, with respect to the CVA and some of the comments that Todd made. In particular, how are these being used in other regions, and I will show a few examples, just to hopefully kind of spur some discussion, or some ideas, about how we might apply the experiences of other regions to the South Atlantic.

What is an ESR? It's basically a synthesis of scientific information across a whole range of ecosystem components, from physical characteristics of the environment to the biology and ecology and fisheries, all the way up to human communities, things like changes in demographics, engagement in recreational and commercial fishing, social connectedness, a whole range of indicators.

The intent is to compile this information and provide it in a concise and easily-accessible and easily readable form for use by managers, and it is intended -- The intended audience is managers, and, in our case, that's often the council, but it would also include other sort of management bodies and other stakeholders in the ecosystem.

As Mike alluded to with the CVA, this is a core component of a number of the sort of national initiatives that are related to ecosystem-based management, the Climate Science Strategy, and it's a component of the EBFM Roadmap, as well as the associated implementation plans for the different regions, as well as a number of the Integrated Ecosystem Assessment Regional Plans.

They really have three sort of broad objectives. As I mentioned, one is to provide a broad level overview of the state of the ecosystem, with respect to both recent and historical trends and a suite of indicators. Transfer that knowledge to managers, hopefully to provide context for decision-making or provide information relevant to decision-making that affects marine ecosystems and the resources, as well as just to serve as a vehicle to facilitate increased communication between scientists, managers, and various stakeholder groups.

Where are these being done? This is the locations where ESRs have been done outside of the Southeast region, and so these have been ongoing for quite a while in a number of other regions, and so in New England since 2009, and some of the ecosystem status reports in the North Pacific date back to the late 1980s, and the California Current system started in 2012. One of the more recent was for west Hawaii, which was completed in 2016, and so these have started at different times in different regions, and they are updated at different frequencies, and so some of these are part of the operational activities of the Science Center, where they routinely produce these, on an annual, or maybe biennial, basis, and others are updated more intermittently, as needed, or as resources allow.

We have three ecosystem status reports under development in our region, and the first was done in the Gulf of Mexico, which was completed in 2013 and then updated in 2017. The one I will talk about today is for the South Atlantic, which we're planning to complete this year, and there is one that is in progress for the Caribbean as well, and so, I think at this point, all of the major sort of ecosystems and all of the areas under the purview of the various Science Centers have ecosystem status reports that have been completed or are soon to be completed.

For the South Atlantic, we've had a number of contributors that I would like to acknowledge, and we had fifty-seven different individuals from twenty-three organizations, and I try to keep a tally

of who has contributed to this report, and you can see the different organizations listed here, and we've got a number of the labs within the Southeast Science Center. Virtually all of the state resource management agencies have contributed, in one way or another, and a number of universities in the area, as well as other groups, both under the purview of NOAA as well as other organizations, like USGS.

One of the key attributes, or the key characteristics, of an ESR is this notion that there are ecosystem indicators, and what are indicators? They provide quantitative trends that reflect these changes and the condition or the state of the ecosystem over time, and I have underlined "quantitative" here, because we do try to focus on time series of things that we can actually quantify.

We typically focus at a regional spatial scale, which, for the South Atlantic ESR, it's basically the jurisdictional area for the South Atlantic Council, and you see that here in the upper-right, although we do include some indicators that are reflective of inshore waters, like stream flow and things that are impacting some of the estuaries, as well as precipitation and things like that that are more land-based indicators, but, in general, we're focused at a regional spatial scale, and so a monthly to an annual, and in a couple of cases decadal, time scale.

The intent is to quantify these indicators and how they've changed over time, and also to assess how they're sort of interrelated, or not, with each other, and so, for the South Atlantic, we have seven categories of ecosystem indicators, and forty-eight indicators, like sea surface temperature or precipitation or what have you, and then 182 individual time series, and so it's a pretty broad kind of comprehensive look up across the ecosystem. We try to report those in a standard format, to make it sort of digestible for people, and that's shown here in the bottom graph here, and so this is an example, which is showing the monthly trends in the Atlantic Multidecadal Oscillation, which is one of the large-scale climate drivers that affects our region.

In this case, the dashed line is the mean over the entire time series, and the solid lines are plus or minus one standard deviation from that mean, and then just to show when that indicator is above or below some threshold color code values, and above one standard deviation is green, and below one standard deviation is red, and then we do some statistics on the most recent years, usually the last five years, to see if that indicator is actually trending up or down, or is it relative neutral, and so most of the indicators are presented in this sort of a format.

These are the different categories, and so there are seven categories overall. Climate drivers, these are large-scale phenomenon, like the Atlantic Multidecadal Oscillation that I showed in the last slide, the North Atlantic Tripole, and you may be familiar with things like El Nino and La Nina cycles, and those will be large-scale climate drivers that affect a particular region. Physical and chemical pressures, things like sea surface temperature, ocean acidification, sea level rise.

Habitat is one that we struggled with a lot for this region, because there's just not a lot of large-scale information on coastal and marine habitats, but this would include things like the extent of wetland coverage, seagrass, oyster reef coverage, and, also, another area where we had relatively limited information was on lower trophic levels, and so we do have some indicators related to primary productivity, some related to secondary productivity, zooplankton abundance, but they tend to be fairly localized in nature. Forage fish would also fall under this grouping as well.

Upper trophic levels are more typical like fish abundance and diversity, and snapper grouper would be an example there, and then ecosystem services, and so you can think of the ecosystems supporting a number of services, like the provision of commercial fisheries, or also protected species, and then we included a number of things that we group under human dimensions, and so those would be things like trends in demographics, population size and density, trends in fishing effort in commercial and recreational fisheries, a number of sort of economic indicators, the value of commercial and recreational fisheries and those sorts of things, or just the value of the general ocean economy, which includes fisheries plus a number of other marine-related activities.

That gives you sort of a sense of the organization of the report and the different categories, and I just pulled this straight from the report itself. This shows the table of contents, and I don't expect you to read all of this, but you can kind of get a sense of all of the different indicators that are included within each one of those categories, and I do have the draft report available that I can pull up, if you see any of these that kind of strike your interest and want to see.

What I want to do is just kind of highlight a few of the indicators and show you how they may be related, and in fact may be related to some of the management interests of the council. We had a little brief discussion about temperature earlier, and I will show you some of the indicators related to water temperature and how that has changed in the region over time, how those changes in water temperature may be influencing other ocean dynamics, in particular upwelling, which influences the transport of nutrients up into the photic zone, which can have implications for primary productivity, and then how those changes in ocean conditions may be related to recruitment dynamics of some of the species that are managed under the purview of the South Atlantic Council.

Just to focus on temperature, there is evidence that temperatures are increasing in the South Atlantic region, and we have indicators at seasonal, annual, and also decadal, timescales that support that. This shows the area of the Atlantic Warm Pool, and so this is one of those large-scale climate drivers. You can see, on the map at the upper-right, that it occurs throughout the Western Atlantic and Caribbean, and this is the hurricane development corridor off of north Africa that generates a lot of storms that affect our region, and so it's not relegated to the South Atlantic region, but it does impinge on the South Atlantic, and manifests there, and so there's been an increase in the area of that Atlantic Warm Pool since the mid-1990s or so.

It's not clear all of the underlying reasons for that, and one of the reasons is that we have had a shift in the Atlantic Multidecadal Oscillation that occurred in the mid-1990s, and so we're in more of a warm phase in more recent years, compared to earlier times, but that's one indicator, suggesting rising temperatures, that are influencing the South Atlantic.

This is surface temperature, and this is a different scale, both temporal and spatial, and so this is synthesis of temperature data from the World Ocean Database that's maintained by the National Center for Environmental Information, and so this is basically a repository of temperature measurements. There's a modeling process that's undertaken to generate mean temperatures at a decadal time scale, and this is for both surface temperature on the left and bottom temperature on the right, and so you can see the decadal mean temperature from 1960 to 2010, for both surface and bottom, in these two graphs.

There's been about a one-degree increase in the average mean decadal temperature in the South Atlantic region, shown here in this map, since 1980, and that has occurred for surface temperature,

and it also is evident in bottom temperatures as well, and so another indicator that temperatures are rising.

This is something that is a more traditional measure of temperature, and this is sea surface temperature from MODIS satellite imagery, and so this is at a monthly timescale, going back to 2003, which is when that satellite was deployed, and, if you look over the long term, temperatures were fairly stable over time from the early 2000s to the late/early 2010s. Actually, there were a lot of anomalously cold winter temperatures in that early time period, but, since about 2013, we've had relatively high sea surface temperatures.

On average, sea surface temperatures have been above the long-term mean, and we've had several months, that occurred primarily during the winter and early spring, where those temperatures have been anomalously high compared to the historical record, and then maybe some indication of a slight decline, though still above the long-term mean, in the most recent years.

Another sort of indicator related to temperature, this is bottom temperature, and this is from the SERFS trap video survey, which is a joint -- It's a joint survey effort between the Southeast Center and MARMAP and South Carolina, and you can kind of see the distribution of stations, and so this is a point-in-time survey, where CTD casts are made and bottom temperature measurements are taken, and not as much of an indication of a long-term trend in this case, going back to the 1990s, but the highest temperatures on record have been in the most recent years, and so, again, these later years of 2014, 2015, 2016, and 2017, and so four of the six warmest years on record have occurred within the last five or six years, and so, again, another indicator that temperatures have been increasing.

I think that's one of the values of the Ecosystem Status Report, is we can look at the same phenomenon, in this case water temperatures from multiple perspectives, both surface and bottom, monthly timescales to decadal timescales, and, from just different information sources, they all have their sort of inherent advantages and disadvantages and come out with some sort of sense that these patterns are corroborated or not, and so I think, in this case, there is evidence that temperatures are beginning to rise in our region.

Whether that's part of a long-term trend or sort of blip on the radar is yet to be determined, but it does also look like those temperature increases are corresponding to some other changes in ocean dynamics, and so this is another indictor that's in the report, and this is an upwelling index that's based on some wind data that is collected by a buoy at the Grey's Reef Sanctuary, and so upwelling, coastal upwelling, is related to nutrient transport and the availability of nutrients in the photic zone, which is what drives a lot of primary productivity in our region, and you can see the upwelling has been declining since the mid-2000s, since 2014 or so. It's a similar timeframe to some of those changes in sea surface temperature and bottom temperature that I showed earlier.

Prior to about 2015, we have lots of periods where there were strongly upwelling favorable conditions, and we haven't really seen those conditions over the last five years or so, and we've actually seen upwelling unfavorable conditions, a lot of negative anomalies, in the last five years, and so a suggestion that we're seeing some declines in upwelling that could be affecting nutrient transport in the region.

Speaking of nutrient dynamics, this is another time series in the report for chlorophyll, surface chlorophyll-A, which is related to basal primary productivity, and you can see there's also been below-average primary productivity in the region since the early to mid-2010s or so, and so we haven't seen these really high periods of primary productivity, particularly in the most recent years, and, actually, it looks like there's been a bit of a declining trend in primary productivity, on a similar time as has been seen for the upwelling index and also the changes the sea surface temperature.

These maps just give you a sense of what a high-productivity year might look like, and this is from the satellite imagery, where you see a lot of green in the surface waters up and down the coast and across the shelf, and then a low-productivity year, where you see these large areas of orange and with more sporadic or disparate areas with high productivity. We're working to determine to what extent these things are actually linked, and one of the implications might be that this could be contributing in some way, or underlying, some of the declines in the recruitment of reef fish that spawn in the winter and spring, and so these are increasingly being documented for the region.

These are actually -- These are recruitment deviations from some of our assessments, and this is for black sea bass on the left, red porgy on the bottom-left, red grouper, and gag grouper. Gag grouper is a little bit dated, and I just finished the update for this assessment, and there is fairly low recruitment out through 2019, and so the pattern is fairly similar, that we're seeing some evidence of declines in recruitment from the stock assessments, which basically integrate all of the available data sources relevant to that stock in the region.

We also see those declines in a lot of the survey indices, some of which go into those assessments, and so, again, here is black sea bass. The last big recruitment event seemed to be in 2010/2011. Similar, red porgy has been declining, and red grouper, and, as I mentioned, gag grouper. Now, there's some variation in time scales here, and the magnitude of those declines -- We don't fully understand all of those linkages, but the suggestion is that there is potentially something going on with ocean conditions that are affecting the productivity of the system, and that could be influencing the recruitment dynamics of a number of the more economically-important species in the region.

I think that's a working hypothesis that we have that has arisen out of the synthesis of information that's embodied in the Ecosystem Status Report, that these warm winter and spring temperatures are promoting water column stratification and that that could be inhibiting nutrient upwelling, leading to lower primary productivity and potentially lower recruitment, and we've got a number of projects that are going to be addressing the veracity of that hypothesis over the coming years.

I think the point here is that one of the benefits, or purposes, I think, of the ESR is to -- By synthesizing this information that's often across a variety of different disciplines, and fairly disparate in nature, the ESRs can help lead to the development of novel hypotheses, in this case a working hypothesis regarding recruitment dynamics, that can really serve as a focus for additional research. That is one example of some of the things that are emerging out of the Ecosystem Status Report.

I will just highlight a couple of the other indicators, really just to give you more of a flavor of what's in the report. We do have information on sea level rise, and so this is something that, if you're aware of, it's been a long-term trend in increasing sea level rise since the early 1920s, and

there's some suggestion that that rate has potentially increased since about 2011, and that's based on information that's collected and maintained by NOS and a number of stations throughout the region, and we're seeing sea level rise in the South Atlantic that's fairly comparable to the long-term global average.

Another example, in this case, is for upper trophic levels, and so we have several mean trophic level indicators, and mean trophic level is basically a weighted average of where harvested species are feeding within the food web, and so you may have heard of fishing down the marine food web, which is common in harvested ecosystems, where harvest initially concentrates on the large apex predators and then is increasingly reliant on smaller-bodied species lower in the food web, and it's often used as an indicator of overall ecosystem health, at least from the perspective of upper trophic levels.

We track that in various ways, and so this is showing the mean trophic level based on commercial landings, and we exclude menhaden, because menhaden has such a huge influence, in terms of overall biomass, but you can see, in the South Atlantic, the mean trophic level is at a maximum in the mid-1970s, which corresponds to the rapid development of a lot of the fisheries in the region, and you tend to see some of the highest harvest rates occurring during this period in the mid-1970s and early 1980s. Then the stocks start to decline, and then, in the 1990s and early 2000s, a lot of the management regulations start to kick in, and that index starts to stabilize, and perhaps, at least in the case of commercial, landings start to increase, and we see a reasonable correspondence between the commercial sector and the recreational sector.

This is something that we can track over time, and it gives us some sort of indication, from an overall sort of ecosystem perspective, of how fisheries are doing, or how the ecosystem is doing, with respect to commercial and recreational harvest.

Then the last one that I will mention here is the ecosystem services, and so this is -- You can think of ecosystem as provisioning fisheries that are extractive fisheries in the region, and, in our region, those consist of both commercial fisheries and recreational fisheries. In the case of the commercial sector, it's pretty clear that there's been a decline in commercial landings overall since the 1980s, as well as in commercial revenue, and an increase in recreational landings, an increase in recreational effort, and, if you look at the species that are managed by the council, and these are just the federally-managed species, they are increasingly recreationally dominated.

Historically, there's always been a large recreational component, but, particularly in the last few years, that has become more amplified, to where 80 to 85 percent of the landings are coming from the recreational sector, and that has a whole host of sort of implications for how you might want to manage those fisheries.

That just gives you a few examples of things that are in the report, and I did want to, in this last section here, talk a little bit about how this information can be used, and particularly trying to draw on how it's used in other regions. I showed this slide at our discussion last fall, and this is from an EBFM workgroup meeting that was done last year, where Chris Harvey, who is at the Northwest Center, basically surveyed all the regions and asked them what are your ecosystem status reports being used for?

About 75 percent of those are being used as like a science synthesis document, to focus research, and so that would be similar to sort of the recruitment example that I described earlier, where that synthesis has led to some more focused research projects to address some pretty targeted questions. A lot of them are being used as a public outreach document, and so they're available on websites or other formats that can be easily used and digested by a variety of stakeholder groups. For example, the Northeast does a state of the ecosystem flyer, basically, which is just a two-page sort of highlight of what is going on with the ecosystem in that particular year.

Nearly all of them are being used in some way to provide context for managers, and so these are being distributed to councils and used by other management bodies. About 50 percent or so are being used in an operational sense, and so I think this is where there's a lot of effort focus now as to how do you operationalize ecosystem status reports, and not just produce a bunch of indicators and provide a bunch of information, but how do you really integrate that into the management process, and I think that's what a lot of the centers are very focused on right now, is how do we up this number and get these reports used more from an operational perspective.

What does that look like? Well, Mike gave some examples, and Todd gave some examples, and I will show three sort of specific ways, I think, that ESRs have been used, from a management perspective, and Mike had mentioned the scenario planning, which I looked into that too, and I know Roger is involved in that and can speak to that as well, and that's another example that I don't include here, but ESRs have been incorporated directly into stock assessments, which I kind of think of as frontend, and it's where you use the indicator formally in the stock assessment model that is used to generate the management advice.

Also, they can be incorporated in the decision-making process sort of after the science has been reviewed, and so I think of this more as a backend way, and it's not formally incorporated into the assessment model, but it is presented along with the stock assessment and other sorts of scientific information, and it gets considered in the decision-making process. Then I will show an example of some risk assessments that the Mid-Atlantic Council has -- The approach that they have implemented, where they have used their ecosystem status report to develop an ecosystem-level risk assessment for that region.

This is an example of how it works in the context of a stock assessment, and this is in the Gulf of Mexico, and you have probably heard of red tides and the effects that they've been having on some of the fisheries down there, and this was from the national news a couple of years ago, where sort of dolphin and sea turtles and things were washing up on south Florida beaches, but there's a history of this work at the Southeast Center, with a number of the folks in Miami, and, here, there's a red tide index that was developed from satellite imagery, and so very similar in concept to the ecosystem indicators that I showed earlier.

This is a little bit dated, and it's been updated since then, and that red tide index was incorporated into the stock assessment for gag grouper and for red grouper, as an additional mortality source, and it actually helped to improve the assessment model itself, and so this is -- If you include the red tide effect on grouper mortality, then you get a better quantitative fit to the index that's used in the assessment than if you don't, and so this was a case where inclusion of the red tide indicator explained about an eight-million-pound decline in grouper that was observed in 2005, and it actually led to a more robust assessment, and so some of the key points in that effort was that you

really need to have a quantitative link between and indicator, and in this case red tide, and a mechanism by which it affects the population, in this case mortality of grouper.

In the red tide example, this was actually a situation where it was brought to the attention of the assessment folks from stakeholders. The fishermen on the water were seeing this, and seeing a lot of floating grouper and things, and they raised it as an issue and said that it needed to be included in the assessment, and its inclusion actually improved the assessment in a quantitative way, and so this is one way by which indicators from ecosystem status reports can help facilitate management, is by direct incorporation into stock assessments and other sorts of modeling activities that are used to develop the advice, develop the management advice.

A second example, which is sort of a backend example, is something that has occurred in the North Pacific, with Bering Sea pollock, and it's been used by the North Pacific Fishery Management Council, and they have an annual stock assessment for pollock that's done every year, and they also have an ecosystem status report that includes a variety of indicators, and it's updated every year, and so the ecosystem status report suggested that there were some rising temperatures in 2016. If you remember, there was sort of a marine heatwave that occurred in 2016 in the North Pacific.

There have been declining trends in krill, which are prey for young pollock, and increasing trends in arrowtooth flounder, which are predators on juvenile pollock, and so these were all sort of indicators that were being tracked in the ESR. Then, on the right, you can see how that fed through the management process, and none of these were incorporated in a formal way into the stock assessment, and they were just presented, along with the stock assessment, to the SSC and to the council, and so, from the pollock stock assessment, the statement that additional precaution may be warranted, since warm conditions are thought to negatively affect survival.

The SSC built on that and said our current understanding of pollock early life dynamics suggests that recent survival may be low, due to low availability of suitable prey, and then, from the council's management, the quota was reduced, under a more conservative Tier 3 approach, and so they did, in this case, reduce the quota that year, based on these ecosystem indicators. I do think it's important to note that, in this case, it did lead to a reduction, but the alternative could occur as well. If these leading indicators were suggesting more favorable conditions in the future, then there's also the possibility that you could increase a quota or undertake perhaps less-risk-averse management, in light of that information.

Just trying to translate that back to the recruitment example that I described earlier, if we do see continued increases in sea surface temperatures and other temperature indicators, decreases in upwelling, below average productivity at the base of the food web, and continued declines in recruitment, then that is information that could be provided to the council, or to other management bodies, that could help to inform their management advice, and a couple of ways that could be done would be sort of in a direct way, similar to the case of walleye pollock, where you could imagine modifying an ABC, or an ACL, from a stock assessment, based on this sort of information, or it could just be used to suggest different sort of projection scenarios. What does harvest look like in the next five or ten years, if we assume continued low recruitment or continued high recruitment, and so those are a couple of ways, I think, that that sort of information could be used by councils in helping to inform their management advice.

The last example is the one that Mike sort of touched on in his presentation, and that's the use of these indicators in risk assessment, and so what is risk assessment? It's an evaluation of the potential magnitude and consequence of negative events that might impede achieving biological, economic, and social objectives. That's a pretty sort of broad statement, but there is this paper that was published a couple of years ago that really outlines, in a nice way, what the Mid-Atlantic Council did in developing a risk assessment for that region.

The overarching goal is to basically rank -- We know that these ecosystems are affected by a number of potential risks, and there is various, and sometimes competing, management objectives, and we need some way to kind of organize that information, and so the overarching goal is to develop a ranked risk assessment that can help to focus what species or what management objectives may be particularly high risk, and that can provide a basis for prioritizing research or management efforts or pursuing further evaluation or potential mitigation.

Just to give you a quick walkthrough of what they did, there are really three steps involved. They defined these risk elements, and those can be ecological, economic, social, food production, management, and these were actually defined by the council, and so one example, just to kind of continue the changing ocean conditions and recruitment theme that I described earlier, is that one risk might be not achieving optimum yield due to changes in ecosystem productivity at the base of the food web.

They identified a number of indicators, from their ESR, that was related to each risk element, and they also had expert opinion weigh-in on some of these things as well, and they had four indicators of total primary production, zooplankton abundance, and then some aggregate measures of fish productivity and fish condition and survey recruitment indices, and so those were their four indicators, and we have some version of these, or similar indicators, that are incorporated into the ESR for the South Atlantic.

Then they score those indicators, or they score the risk relative to those indicators, and so, in the case of the Mid-Atlantic, low risk was no trend across all the indicators, and low to moderate risk was a trend, either positive negative, in one to two of the indicators. Moderate to high was a trend in three or more of the indicators, again either positive or negative, and then really high risk was if you had a decreasing trend across all four of those indicators.

What you end up is with something like this, which is basically a matrix that kind of highlights the particular species, or the management issues, that are posing the highest risk to meeting whatever the council's, in this case, management objectives are, and so you can see the green area, and there is relatively low risk for these managed species, with respect to food web interactions, and so there wasn't much risk with respect to declining prey or increasing predators, as was the case for the pollock example, but we mentioned distribution shifts, and almost all of these species are at moderate to high risk for distribution shifts, sometimes associated with changes in climate, and, also, you can look across these different management objectives and see what species are at particular risk, and so summer flounder seem to be a high-risk species, because it's in the red, or the orange, across a whole host of the objectives that were identified by the council.

I think this is kind of a useful way that you can take kind of the quantitative information that's in the Ecosystem Status Report and translate it into something that is a little more qualitative in nature, and potentially usable, in terms of helping to prioritize areas of concern or anticipate where

high risk occurs, both across whatever suite of species are being managed, but also across some of the different sort of goals that the council might have.

That was all that I had, and I would be glad to sort of go back and talk about any of those issues, either the report itself or some of the ways that that information might be applied to particular management issues in the South Atlantic. By way of sort of ending here, I just put up a timeline of where we're at. We do plan to have this report complete in the next month, and so we have been finalizing some of the final analyses and focus more on the writing. We do anticipate -- We're at the very end of that, and so we do anticipate that being done in the next few weeks.

Then we are going to be soliciting feedback, and so we hope to get feedback from this group, as well as others, and we are, I think, starting to think about ways of how to make this available, whether that's from a website, like where the other ecosystem status reports are, or some other venue, and that's still to be determined. We're considering some more summarized versions, and the report is pretty in-depth, and I mentioned that it does include a lot of information, but there are certain key highlights that come out of it that I think would be good to sort of make available in a more condensed version.

Then, as Todd and Mike both alluded to, the intent is that this be some sort of living document and that it be updated and its relevancy maintained, and so we're thinking about sort of approaches to doing that, and so I would be glad to take any questions, or I welcome any feedback. I put my contact information here, and Todd's information as well, and so feel free to email, if you have any additional questions or feedback for us, and I appreciate the time. Thank you.

MS. DEATON: Thank you, Kevin. That was really helpful, with the examples of how it can be used. I appreciate that. Does anybody have any questions for Kevin? Wilson.

DR. LANEY: Thank you, Madam Chair. Kevin, I think, when this was presented in October, one of the additional potential indicators we had discussed was the possibility of trying to look at the frequency of fish kills in the four South Atlantic states, and I know that those are a bit inshore of the area that you're really looking at, but I am pleased to see that wetlands are now included, and I think we had discussed that as well, and so have you given any more thought to the possibility of trying to plug in some information on the trends in fish kills?

Sort of tangential to that, it would also be interesting to see the trends in anoxic events within the South Atlantic, especially those that were not related to hurricane events, and I know that, frequently, especially in North Carolina anyway, and I think South Carolina also, when we get these massive hurricanes that produce a tremendous amount of freshwater flow, we tend to have large areas of anoxia and associated fish kills, but I think I would be more interested in those that were occurring that were not associated with storm-related outbreaks, and I think those might be more informative, in terms of their relationship with increasing temperatures associated with climate change, and so I will shut up and let you respond to that.

DR. CRAIG: Thanks for that, Wilson. I appreciate the question and your comments. I guess the short answer is we don't have fish kills in there now, and, as I mentioned, there's an endless array of things that could be included, and we do intend to make these updatable, and that's something that could certainly be included.

It's something that I'm partial to. In my sort of research life, I do work on hypoxia and anoxia issues and how those impact fish and fisheries, and so I'm aware of that issue, but we just haven't included it, because it does take -- We had fifty-seven people, and twenty-three organizations, contributing to this, and it takes somebody who can sort of pick up the ball and compile that information, but that is something that we can certainly -- We do have a research recommendations section of the report, and where we kind of document where information is limited, or where we think there might be information that could potentially be tapped for some future version, and I would say that sort of the hypoxia and anoxia issue might fall into that category.

We do have indicators related to hurricane frequency and storm intensity, and I didn't really talk about those here, but those are things that do have large-scale, region-wide effects and can potentially have sort of really severe economic consequences, and so we did include two indicators related to storm intensity and then the frequency of landfalling hurricanes and how that has changed over time, and I would be glad to share that with you.

The extent to which those are related to the hypoxia and anoxia issue, I mean, I think you're bringing up one of the purposes of the report, is to ask where those linkages may be, and so, just in the same way that we started seeing connections between some of the rising sea surface temperatures and some of the other changing ocean conditions and potential implications for recruitment, I mean, you can look at that issue that you just raised about the potential relationship between storms and hurricanes and anoxic events within that context as well, and we just haven't really done that yet, at least in this version of the report.

MS. DEATON: All right. Thank you. Trish, do you have a question or a comment?

MS. MURPHEY: To a little bit of this, and I'm just going to speak off something, and it's just a webinar that I attended, and so I really did not understand all of this, but I listened to a webinar about empirical dynamic modeling, which I guess looks at patterns, and so, just listening to all the different trends that were discussed by Kevin, I wonder if that might be another avenue at trying to get at better stock assessments, I guess, or less uncertainty to stock assessments.

When you showed that one example where red tide explained some of the uncertainty, I wonder if this -- If you're familiar enough with this EDM stuff, if this might be an avenue to start pulling this information through this EDM modeling into stock assessments, and you have a better model, and so, with that, I don't know a lot about that EDM, but it was an interesting concept.

DR. CRAIG: It's interesting that you mention that, and EDM is -- I can't remember the acronym. It's environmental dynamic modeling, or ecological dynamic modeling, but it's basically an approach that looks for patterns in data and potential underlying drivers based on some of the sort of underlying spatial and temporal correlation structures, and it is something -- I wouldn't say -- I am certainly not an expert, and I'm vaguely familiar with it. I will say that it is actually being considered in the Gulf of Mexico, for some of our shrimp assessments.

If you're familiar with stock assessments, we have typically used age-structured models, which integrate a variety of different data sources, and those, for a host of reasons, aren't that great for shrimp, which tend to be like an annual crop, and they have an annual abundance, or annual recruitment, or something like that, and EDM is being considered in that case.

I guess I haven't really thought how that might be used for the indicators here. I think you could certainly -- If you have time series of abundance from a survey, and then you have time series for a variety of potential environmental drivers, perhaps from an ecosystem status report, then you can construct models of the population dynamics and the effect of underlying environmental drivers that can, in theory, be used in the same way that a stock assessment might be used, as a way to kind of generate management advice, or catch advice, and so, yes, I appreciate you bringing that up.

It is something that I think is relatively new, and I wouldn't say it's mainstream, and it has filtered its way into the Center in some other contexts, but, I mean, I would be interested in learning more about how that might be applicable or utilize some of the sort of time series that we're developing in the ESR.

MS. MURPHEY: I think that's why I had listened to it, because they were looking at it for shrimp in the Gulf, and that's why I was interested in it, and so, anyway, like I said, I didn't understand it very well, but I knew it had something to do with patterns and trying to get -- I guess your typical stock assessment makes a lot of assumptions, and this kind of gets rid of them, but, anyway -- I don't know that trends count as patterns, but, anyway, thank you.

MS. DEATON: All right. That was great. Cindy, go ahead.

MS. COOKSEY: I needed to see the progress that has been made, and this is a tremendous lift that you guys have done, in bringing it to this stage, and you're super close to the finish line, and I could continue to say great things about it, but I also want to really look at a little bit a future-thinking process. As we look at what's happening with some of the other regions, we have seen these ESRs are updated on some sort of annual to intermittent process. Now that you've gone through this initial massive effort on the first version, what kind of cycle do you think you would like to see this looked at again in the future, and what kind of effort do you think would be involved in updating it at future time points?

DR. CRAIG: I mean, I think that's a great question, and I'm not sure that I have a firm answer for you. It's not completely within my sort of power to decide, and I think you're right that this was -- I mean, it's a lift to do this, because they are very intensive, in terms of the time and resources, if you've ever done work with sort of datasets and things coming from third-parties and agency datasets and things like that, and they take a lot of work to kind of get and synthesize and understand and then put together.

I think, in our case, we were associated, or involved, to some extent, some of us, with the Gulf Ecosystem Status Report, and so we used that as a platform to try to generate something for the South Atlantic, and, in doing that, we bypassed sort of a scoping phase for the report, and so we didn't, because of time and resources and other sorts of issues, we didn't undergo a real formal scoping process with stakeholders and managers.

We kind of built off of what the Gulf had done, and our own sort of interactions with other regions to develop the report, and so I think, in my mind, that's something that needs to be done, is to talk to more of the stakeholder and management community about what their objectives are and how we can develop these indicators that serve those objectives, and so I would lobby for some sort of scoping process, where we did that, and that may lead to a different set of indicators, an expanded

list of indicators, perhaps a curtailed list of indicators, that we could then focus and make it more management relevant. I do think that sort of a process needs to occur at some level.

In terms of the frequency, I hate to say it, but I think a lot of it does come down to resources, and, if you look at the agencies that are doing this on an annual basis, they have dedicated teams of people, and this is what they do for their job, and so we haven't had that, historically, in our region, and we had the little bit of discussion about the climate initiative and how some of the underlying sort of political drivers may be changing, to some extent, and so whether that leads to additional resources, or more focus on this sort of work, I guess is an open question.

I guess one thing that I would sort of suggest that the AP could do is let the Science Center know that this is important information for your work and that you would like to see it continued, and, if there's ways that it can be improved or modified, to put those forward, because I think that's the sort of pressure that we generate, potentially more resources to focus on these kind of activities, and so I don't know if I'm the best person to answer that question, and that's basically my sort of two-cents, and I don't know if Todd, or maybe somebody else, has some other thoughts on that sort of issue.

MS. COOKSEY: Well, I do think that your answer kind of highlights the need that this might be some further conversations for the AP, so that we can discuss where we need to again talk about trying to direct resources or effort to keep these efforts going, and I'm hearing that some of the other Fisheries Science Centers may have teams that are devoted to this topic, and it allows them to do it on a greater frequency, to have a devoted team, which makes a lot of sense.

DR. CRAIG: Yes, and I think that's absolutely the case, and I think the reality of it is that our ability to work on these things has to kind of accommodate our day job, and so I have a different -- I have a job where I am heavily involved in the stock assessment enterprise and doing stock assessments for the South Atlantic region and some other sort of priority areas that I work in, but, yes, it does sort of have to be worked around that, and so I think you're right that those sort of dedicated resources are important.

I guess our approach, when we had these discussions initially, was, well, do you just wait for the resources to come and don't do anything, or do you try to do something and kind of get something on the books and work towards getting the resources to support it, and I think that we chose that latter path, where we sort of made an effort to sort of put this together for the South Atlantic region without sort of a formalized mandate or a budget or dedicated resources and things, and I think that was a challenge, and I think that challenge has been met. I think the next challenge, as you just articulated, is how do you maintain it.

MS. COOKSEY: Right. How do we keep it going, to make sure that this is going to be updated on a somewhat regular basis, as well as look for opportunities to, like you talked about, scoping it, so that we can kind of narrow down the focus, so our managers are getting what they need, as well as looking for other areas that it can be utilized, potentially in the regulatory environment, and so I think -- Hopefully this is the beginning of even more discussions on where we can go from here.

DR. CRAIG: Yes, and certainly any sort of guidance or feedback you have on that scoping process, or how to conduct it, because I do think that that is important, because the thing that will keep it going is to make it management relevant, and so, the more that we can make this useful to

people who are in positions of making decisions, or making recommendations on which decisions are based, then the more likely that there will be some sort of effort to sort of maintain this kind of activity.

MS. COOKSEY: Well, thank you so much.

MS. DEATON: Kevin, when would this be available for the advisory panel to review? You said a draft would be available?

DR. CRAIG: We have a completed draft, and I didn't mention it in the presentation, but we do try to synthesize across a number of the indicators, and so we need to do some more sort of statistical analyses, to try to pick out some general patterns that we're completing now. The writing is done, and we do have an editorial group, and so we have a number of co-authors on the report that have contributed, but those people that I mentioned at the beginning are kind of the key editors, and they have all reviewed it, and so we're sort of finalizing some of the writing and some technical aspects of the report. We have completed most of that, and trying to sort of update the graphics and make them more sort of presentable and things, and we've done that. I think this would be available -- I would say, at least in a draft form, within a month. We are very close to that.

We do anticipate this going through some further review process, and we haven't really discussed, in the Center, exactly what that might take, or what form that might take, and we do anticipate making it available, and I just had a little bit of an email exchange with Ellen Spooner, who is our communications person, and we're going to have a conversation about how to make this available on a website and put it with the ecosystem status reports for the other regions and kind of go from there.

The Gulf has developed a really nice website where that report can be downloaded, but also where a number of the more key indicators can be easily sort of visualized, in sort of a web format, and so we discussed that as a possibility as well, and so I do think all of those things are sort of to be determined, but I think the short answer is within the next month there would be some sort of draft report that we could potentially circulate, and it would be great to get feedback from this AP and other groups.

MS. DEATON: I think that would be great, and there would be probably a lot of interest from the members here too to give it a look and give you some comments, and so you could just send it to Roger, and he can pass it along.

DR. CRAIG: Okay.

MR. PUGLIESE: That sounds great. I'm just jumping in, real quick, and I appreciate how far things have come. This has been a long time in development, I know, and it's nice to see us finally catching up with some of the other regions. One of the things I think that's really critical, and it's great to hear the timing on it, is how some of this information is going to help and support, or be utilized, in some of the climate scenario planning activities and seeing how it's being used in the other regions, because that may be -- Both this, as well as information from the climate vulnerability assessment, help frame what some of those different scenarios, or discussions, are going to be. The closer we actually have something to see, I think it's going to be then easier to

understand how that can help support the coastwide effort, and, specifically in our region, how ours advances, too.

DR. CRAIG: Great. Well, we look forward to that, and I think, Roger, we'll stay in touch on this, and I think you're right that it has been sort of a long and windy path, but I do think we are very close to the end of it, and so Todd and I and some of the other folks involved will get together and try to push this over the finish line in the next few weeks, and then we can sort of get it to you, and we can talk about frameworks for getting feedback on it and things like that, and so that sounds great.

MS. DEATON: All right. Thank you very much, Kevin. We have one last presentation, and we've got thirty minutes, and so I'm going to suggest that we take a short break, and, Rua, you can get your presentation loaded up while people are doing that. I would say five or ten minutes, and so I have 3:30. Maybe we should just say five minutes, to make sure we get done on time. Try and take a five-minute break and be back at 3:35. See you in a bit.

(Whereupon, a recess was taken.)

MS. DEATON: Let's get started. Rua, I'm going to turn it over to you.

DR. MORDECAI: This will be a nice follow-up to what we were talking about before, a lot about climate change adaptation and indicators and various other places, and so I'm going to give you all an update on the Southeast Conservation Blueprint.

A quick background on that, the blueprint is a living spatial plan to identify important places for conservation and restoration, and so Kevin was talking about indicators and thinking about stuff over time, and we're going to now switch more to focusing on places, and space, in this case, and they were also talking before about future updates and improvements, and so we say it's a living spatial plan, and we do have dedicated staff to help people use it and to help update it, which we've been updating it every year now. Who's been helping, and a whole mess of people from a bunch of different organizations, and bringing in new funding, and they're helping tell their conservation story about different actions, and, also, informing conservation decisions.

It's really set up to help people bring in new conservation funding to the south that wouldn't normally come here, by talking more broadly about the different conservation benefits of actions in a data-driven way, and, also, help us all use our current conservation resources more efficiently. How can we get more bang for our buck, with all the challenges we have here in the south?

This is the Southeast Conservation Blueprint, the 2020 version, and so the darker blues are high conservation value, and the lighter blues are the medium conservation value area. As you can see, it covers a pretty big area of the southeast. This is a primary product of the Southeast Conservation Adaptation Strategy, which Hilary and Mallory are going to talk about on Friday, and so I'm not going to talk about it at all. I'm going to focus in on the blueprint itself. As you can also see, it goes out into both the marine area and inland as well, and so it can serve as that connector between marine, coastal, and inland systems.

Functionally, these high conservation values, these are areas most important for ecosystem health function and connectivity. Medium is places that might require a little more help, and they've got some good bones, but they're also important for buffering high-value areas and for connectivity.

Just a few quick things to keep in mind about the blueprint is identifies potential areas for all kinds of different conservation actions, management and economic incentives and protections and things like that. It is a work in progress, and we're kind of regularly updating it, but that also means that we're always trying to bring in the latest new data and information inputs, and so, just like anything of this scale, trying to cut across land, water, and out in the ocean, it's got its own -- It's never going to be perfect, but it's always getting better.

Also, the idea is it's really designed to provide a regional perspective that can be used in combination with local data and knowledge, and so something to complement the existing more local data that's available and fill in some gaps and put it in a larger regional perspective, that kind of thing, but it's not meant to replace that, but to be used in combination. We spend a lot of time also helping people use it in combination with other data and knowledge.

Looking a little closer at what's closer in the blueprint end of it, I thought it would be fun to go into our soon-to-be-released Southeast Blueprint Viewer, and so I have that pulled up. This is the soon-to-be-released viewer that lets you kind of look underneath the hood. If you're a GIS person, you could always get a hold of the data layers and the documentation, stuff like that, but we've also been kind of regularly working on getting our viewers ready to help people make decisions, but also just to help people look under the hood, and so this is the bigger area of the blueprint itself, and so we can actually just kind of zoom in, to show you.

I think, in this one, we just have some sub-regions defined here, and so, as you zoom in, you can look at sub-watersheds and places, and the same thing. These are lease blocks, as you go out in the ocean, and so, as we're looking at some of these different places, as you click on the pixel, you can look underneath at kind of what's driving those priorities and what's in the meat, and so this is coming from the South Atlantic Conservation Blueprint here, one of the inputs to this larger area, and then you can also look at, okay, what's underneath here, and there's marine birds, marine mammals, indicators underneath there, and then you can keep going, to see what does this exactly tell you, and, if you really want to chase down the data and information, you can do that as well.

It does the same thing as you go into the coast, and so now we've kind of gone inland, back behind Myrtle Beach, and now you have a different set of indicators, things around marsh patch size and extent and resilient coastal sites, all kinds of other stuff, and I'm not going to go into all the details of all these different indicators, although that would be fun to do, and you can do the same thing, about diving a little bit closer into some of these sites and what they say.

On the marine side, for the area that the council covers, we're actually integrating two different inputs. One is you can actually see where the seams are, and they're actually working on some big improvements in Florida this year, and more about that in the future, but here we have some indicators that come into the South Atlantic, and I mentioned them before, and we have things like coastal condition, marine birds, marine mammals, and potential hardbottom condition in there right now.

As you go down into Florida, which Anthony and the folks from the Florida FWC have been working on improving, you start running into a different set of metrics, like blueways, migratory corridors, managed species, and valued habitats, and so we also have that underneath, and so, if you want to look under the hood of the Florida component of this, you can do that as well.

There are also threats, and so charts on urban growth and sea level rise, and so we can look down here in Florida, and we can look at predicted urbanization and all that fun stuff. These are some things currently in the blueprint, and you can already see this seam here, where, at least in the last year's version, they used more actual detection data, versus model data, and so they're working on trying to improve that for the next area here, but lots of cool stuff underneath the hood.

The other thing I wanted to mention, real quick, currently, before I go into new stuff coming this year and next, is we also have some sweet reporting functions, and you can see there's a little upload shapefile option, but you can also do the same with watersheds, and it makes an even more detailed report for you.

I pulled up -- I have one for an example, and it only takes like twenty seconds or so to run, and probably less now, but what it will do for you is you can do it at a parcel level, if you work on the coast, or at any kind of priority area you're looking at, and it will make summaries of a whole bunch of different information for you, and so that includes not just the data, but also it will make pretty maps, and so this one of the watersheds here, and it gives you blueprint priorities, and it gives you information about them, and so things like hubs and corridors and a whole range of different indicators that are there.

If you wanted to look at any of these in a more detailed way, you can quickly jump here, and it shows the area you have uploaded, and it makes a nice map of things, and then it gives you some tables, and so a lot of this we've designed for people that do -- Especially for people that are doing proposals for conservation efforts, and we've designed it so that you can quickly upload your area of interest and get some stats, get some pieces of information that you can pull into your proposals, or if you're evaluating potential areas for conservation actions.

Then you also have some fun stuff related to threats, and here are some over here, and so things like urban growth. This is building in an urban growth model here, and so you've got maps of it, but, also, different projections of how many acres in your area are predicted to be urban by certain points, and then, wherever we can, we've actually included stuff like little soundbites that we've worked with people over the last few years to incorporate, and so, if you need a few one-liners for proposals, and we'll use this percent increase a lot in proposals, when we help people, and so this is something that we're including in the reports, too.

That's a nice little reporting function piece that we've done, and it's fairly slick at this point, but we're making that better, and so we're glad that we've got some potential uses that are interested in using the blueprint, and you'll hear from Hilary and Mallory about -- Hilary works on user support, and we've got those dedicated not just to the data, but also helping people use it, and so feel free to follow-up with us, and it's part of our job, and it's super fun, to help find ways to use the blueprint with you. That was your whirlwind tour of this part, which is some of the current pieces we have, and I know we don't have a lot of time, and so I am going on a quick whirlwind on that front.

That is what's in there right now, and I wanted to quickly talk about what's coming for 2021, and so, by August 15, we'll have stuff ready, and so some stuff coming in 2021 is we're working on an improved hardbottom and deep-sea coral indicator, and I'll talk about that in a second, and a more actionable approach to nearshore priorities, which I will talk about in more detail, and then a few other things that I just wanted to mention that I won't go into that much more detail about is that we've update our marine mammal indicator, to sync with the latest stuff that Pal Halpin and that group at Duke have done.

We're also -- In this version, we've got a big alignment of some of the migratory fish priorities with the priorities of the Atlantic Coast Fish Habitat Partnership, and so we're bringing in basically the migratory fish prioritization coming out of the Atlantic Coast Fish Habitat Partnership, and also the estuary priorities as well, and so bringing in sort of SAV, oyster, and all the other key components that came into that are now going to be indicators in the 2021 blueprint, and so you'll be able to summarize and do all the stuff that I was showing you with that stuff, and the greater blueprint itself, in that connected network of lands and waters, is going to be better aligned with priorities coming out of the ACFHP.

The last thing, which I wasn't going to go into too much detail, is that we've also implemented a better approach to inland saltmarsh migration corridors, and so, before, it just sort of looked at the current saltmarshes and the inland areas and the resilience and didn't do as much in the migration corridors, and so this new version takes an even closer look at the migration corridors of where saltmarsh is going to be into the future, and so thinking about the system holistically in a context of not just where is saltmarsh now, but where is that saltmarsh going to convert to important estuarine habitat and then where are the next best places for saltmarsh, and so that's going to be in the next version as well, but I'm just going to talk about the top two, super quick, as an update to this group.

The first one is the new indicator on hardbottom and deep-sea coral suitability, and so this is an integration of kind of two major resources that are available right now, or three, I guess. Some of the old kind of habitat suitability models that came out of NOAA and some work from the Nature Conservancy and the South Atlantic Bight assessment, and, also, some unpublished hardbottom assessments coming out of NOAA and the latest draw from the known coral locations, and so we'll pulled them all together into an improved indicator, to better capture some of those sites that we knew we weren't capturing in that indicator.

We worked with Matt and some of the NOAA folks, and also Mary Connolly, on the TNC side, both of them, to figure out, okay, what's the best way to use this existing data and use it in a complementary way to each other, in a way that each of those methods could best give us a good sense of those areas, and so the heat map, with the hotter areas being kind of higher suitability, and the cooler being the lower suitability, is a quick picture of what that looks like right now, and a number of you will have a chance to talk a look at it and look for opportunities for future improvements, but that is one thing we've improved this year.

Then another thing we're working on is improving the nearshore priorities. What has happened, and it may not be too easy to see in this, and you probably know where the coastline is, and you all have worked in the South Atlantic enough, but one of the challenges we've have run into, just the scale at which we're doing some of the prioritization, is that, at least in 2020, and in the past, the entire nearshore area comes up as high priority, and, yes, we can dig a little bit deeper in there,

but one of the challenges that folks have had that work in these nearshore areas is like, well, if everything is a priority, it's not helping me prioritize my work.

We're working on some ways to get a little bit more definition and take a slightly different approach to how we bin the priorities in the nearshore area, and part of that is we're now -- When we do the prioritization on the coast and on the land, we're extending a buffer into the marine areas, and so, in this, the draft, and some of you all will see that fairly soon, and you can probably hear my computer fan, and we're actually running the Atlantic coast priorities right now, and so this will actually ensure that not everything along the coast is kind of one solid wall of high priority, but it will take into account the nearby saltmarshes, the inland, the upstream habitat, in addition to things like sort of seabirds and hardbottom and other stuff, and estuarine condition is coming up against this edge.

This will better account there, and then we're also testing out splitting the rest of the marine area into some sub-regions as well, and so splitting out the next layer out, and then also the farther out Gulf Stream ecoregions into different spots as well, and so you will likely get a chance to take a look at that and see what you think about that approach as well, but that stratification will make sure that there will be some variation in the priorities in the nearshore area.

Those are our two quick things that we're working on, and a number of you will see some of those fairly soon. Next steps, we're planning on having online workshops to review a draft of the blueprint and some of these things in late May and early June, and we'll probably get something out in the next couple of weeks about that, and so there will be online workshops, about an hour-and-a-half, to talk a look at the blueprint and look for some opportunities to improve it, and then we'll be working on improvements from the workshops until August, going back to indicators, going back to the priorities, and working on fixing as much as we can fix. What we can't fix, we'll document it as known issues and prioritize for future updates, and the South Atlantic part of this, which covers most of the council's region, except for southern Florida, will be final on August 15, and then the full integrated Southeast blueprint update is going to be final in October. That's next steps for 2021.

Then, for 2022, I know Anthony and some others -- We've been kind of working on trying to connect into the newer data coming out of a lot of awesome stuff from the management council, including the Ecopath and Ecospace component, and so trying to have that two-way direction of bringing that into the blueprint and bringing blueprint stuff into the Ecopath and Ecospace stuff, and so it looks like we'll have some good opportunities for bringing in some of that new data. It may make it into the Florida marine blueprint, since their deadlines are a little later than ours, and we'll see, and I haven't talked to Anthony about that yet, but we're working on continuing to improve and incorporate that stuff.

Also, we're still working on getting, from a climate change perspective, potential future locations of currents and eddies with climate change. There is a couple of different directions that I've still been working on, as far as some of the better, new climate projections that can actually resolve changes in currents and eddies at a fine enough scale. They exist, but, actually, processing and dealing and get ahold of the data itself is quite an adventure, and it's kind of like dropping something overboard on a ship. It's kind of like I know it's down there, but getting it is a lot of work, and so we're still working on that.

I've got some more good leads, but the idea is to try to, in future versions of the blueprint, capture these places that are going to be potential future locations of things like Gulf Stream and future eddies and bring those in as kind of migration space, or important spots that may not be as important now, but will be into the future, with the changes we're seeing, and then also working with Matt and the group at NOAA, and they're working on improved deep-sea coral models, and so, when that's ready, we're looking to potentially incorporate those into the blueprint as an update as well. That's what's in the works for 2022, and that is your whirlwind introduction to those things, with six minutes to spare before the meeting ends.

MS. DEATON: I didn't mean to rush you at all. Thank you very much. That was great, to see it getting better and better, and are there any questions for Rua?

MR. PUGLIESE: Anne, let me shift over, and then we can get the hands raised. While I'm transferring over, just a quick comment to bring us back to the connections. In the past, we were involved directly in the Landscape Conservation Cooperative and the building of the initial conservation blueprint efforts and integrating a lot of the council's habitat information. Many of the participants in our region were involved in that process also, and this is an opportunity -- What's identified in the overview is opportunities for expanding that regional collaboration and really what members see -- If this collaboration and efforts support -- In supporting these conservation blueprints, it will enhance the council's mandates and conservation of habitats.

I think Rua has already touched on some of the connections, and the LCC was the body that funded the core development of the new generation of the Ecopath with Ecosim model, and now we're into actually operationalizing it, through the council and our SSC, and so this is an opportunity for you all to weigh-in on especially some of the different aspects.

I think one of the keys, also, is that that organization's -- This, as well as in the SECAS, as tied directly to the Climate Science Centers, and the opportunity to maybe coordinate with them on future habitat vulnerability, or even on what changes to EFH may be able to modeled, et cetera, for our region, which is being done for I think the Gulf, and I talked to Rua a little bit about that, and so there's a bunch of opportunity that potentially could be highlighted, and so let me get back in here.

MS. DEATON: We have Cindy with her hand up, first.

MS. COOKSEY: This is actually a comment with my day-job hat on, with NOAA's Habitat Conservation Division, and Lisa Vandiver, with the NOAA Restoration Center, and I have been heavily interested in saltwater migration corridors for a couple of years now, and we've done some work with mapping some derelict impoundments, as part of that, and so don't be surprised if you get an email from me, sometime in the next couple of weeks, potentially looking to talk about that a little bit more, as you work on the next iteration of the blueprint, and that's something we're really interested in.

DR. MORDECAI: Awesome. That's fantastic, yes, and we're all about -- I will keep my eyes out. We're always trying to plug into that -- The idea, and what we're trying to focus on in the blueprint, is the connections and rolling things together and hooking into like the great existing work that's continuing, and so we've been linking into the South Atlantic Aquatic Resource

Partnership, and so there's another refresh, using their latest dam data, and so, yes, anytime we can plug into some of that stuff, we're all over it.

MS. DEATON: Rua, on that note, have you -- Are you familiar, or did you coordinate, with Katie Warnell or Lydia Olander from Duke University with the marsh migration corridors? They've done some work.

DR. MORDECAI: The corridors, these are -- These migration corridors come from the Nature Conservancy, and I think they used the same migration space for those corridors. I will have to check with Katie and Lydia on that, but this is -- The corridors we used were through the Nature Conservancy, and we worked with them to provide the best way to bridge between their coastal and terrestrial resilience and their migratory corridors in a way that's consistent with their views, but you did bring up another thing that I didn't mention, because I had to whittle down the cool improvements, but we've also worked with Katie and Lydia on a bunch of stuff, on some of their work.

One thing we're really excited about is we have a new indicator that is kind of an expansion of an existing one, but a new and improved version, and it's about equitable access to parks, and that builds off the work that Katie and Lydia did looking at sort of park access deserts, and so this is a new thing that's going to be in the next version of the blueprint as well. It's looking at these places where there are a lot of people that would benefit from a park, but they are not nearby, and there is actually a place that could be at least a ten-acre park, and so that's one that I am really excited about that came from the work that Katie and Lydia did, and, all along, they were working with us to make sure that it was something that we could integrate, and so I'm very excited to see that one coming into this version of the blueprint.

MS. DEATON: Great. Okay. We'll move on to Rita, and she has a question for you, or a comment.

MR. PUGLIESE: You're unmuted on this end, and so it's showing you muted there.

MS. DEATON: We can go on to Wilson and then get back to you, Rita. As you look, it's at the top, by that side panel, and there will be a microphone, and you can click on it, so it turns green.

DR. LANEY: Thanks, Anne. I will just jump in there, and so, Rua, one question I have is the same one that I believe it was Paula who asked earlier, about whether or not the present administration might perhaps be more receptive to a lot of the work that you all are doing and whether or not we might see perhaps a return to more partner engagement. Now, I know some of what has happened is undoubtedly due to the pandemic and the fact that you all have not been able to have as much face-to-face contact as you did in the past, in terms of the in-person workshops, but I will say that you all have done a tremendous job in keeping people apprised about what you're doing and having virtual workshops and all, but I was curious about whether or not things have improved under this administration, and that's the first question, and then I have another one.

DR. MORDECAI: I would say definitely, already, things have improved, at least at the ability to -- The amount of, I guess, roadblocks that get put up to do anything landscape conservation or climate change, and a lot of those roadblocks came down fairly fast. I would say it's kind of gone

from active headwinds to the kind of opposite, with the stuff that the administration is really interested in trying to roll out.

I mean, I'm not sure yet, and we'll see. There's a lot of good opportunities now, with the push in what the administration is trying to do to kind of grow the engagement and accelerate the progress we have, especially through the whole Thirty by Thirty initiatives and the climate change focus and things like that. That Thirty by Thirty is happening at all kinds of different scales, in counties, in states, and at a federal level, and so I think the interest in what everyone sitting on this call is interested in doing, as far as ecosystem approaches and dealing with climate change and working with people -- There is a lot more interest in that, and so I think that's going to be a real good opportunity to move some things forward, and I think to even get more resources to do more engagement and have even bigger of an impact.

DR. LANEY: That's great to hear, and the other thing was it was really exciting to see the offshore component of the blueprint extend into the Gulf of Mexico, on the West Florida Shelf there. That's great, and then, relative to starting to try and map migration corridors and the aquatic end of things, that is, of course, a topic of great interest to me, and I think -- I'm sure you're aware of all of the acoustic networks, of a paper that just recently came out that summarizes a tremendous amount of the acoustic tracking data for the Gulf of Mexico.

As soon as I saw that, I shot it to a whole bunch of our colleagues and said, hey, all you guys on the east coast that are doing the same thing with multiple species need to get your act together and get that paper published, so we can start to see where these animals are actually going, and, obviously, inlets are going to be a very key feature, for the diadromous species for sure, but also for all of the offshore spawning species that are dependent on inlets for migration into nursery areas as well, and so that's just more of a comment than a question.

Keep up the good work, and I sure miss coming over and hobnobbing with you guys in the office, and I'm looking forward to that. Hopefully, this fall maybe, we can begin to do that. I have been deemed non-essential personnel by NC State University, and so I've been banned from my office for over a year now, but I do sneak over there every now and then, and so, anyway, it's good to hear your voice, and it will be good to hear Mallory's and Hilary's on Friday. I'm looking forward to it, and thanks so much for your presentation.

DR. MORDECAI: Thanks, Wilson. Always a troublemaker. Yes, I think there's a great opportunity for the migration corridor, and there's so much interest. I mean, even on these other meetings from the past, I think it's come up quite a bit, and I think there's some really cool things we can do with the existing information we have, if we put it together and sort of smooth it out. We're looking, with the marine mammals, of doing something, trying something, this year, where we sort of look at those hotspots and think about the habitat and the connections and kind of derive those links, kind of fill in those gaps in between, of where they're moving, and so we'll see how that works out this year, but, yes, it's really -- I think we're on the cusp of some good stuff, and we've already made some good progress.

MS. DEATON: Okay. Rita, do you still want to speak?

MR. PUGLIESE: It's showing her unmuted now.

MS. DEATON: Well, maybe she hit it accidentally.

DR. MORDECAI: Maybe just typing it in the chat, and would that work?

DR. LANEY: I was going to just ask that same thing.

MS. BROUWER: I will reach out to Rita and see if she wants to type it in the chat, and I will let you guys know.

MS. DEATON: All right. Thank you very much. That's the last agenda item for today, although I was going to see if there's any public on the call that would like an opportunity to provide some public comments. We want to make sure that, even though these are virtual, that people have an opportunity to speak. If you do, I think you let Myra know, and is that correct?

MS. BROUWER: Go ahead and raise your hand, and I will see it and post it up for you to see, Anne.

MS. DEATON: Okay. I guess we lost it, but there was somebody that wanted to provide comment earlier, and she missed out.

MS. BROUWER: Actually, I see Claire has raised her hand.

MS. CLAIRE --: I'm a graduate student with the College of Charleston, studying marine biology, and I had a question during Michael Burton's presentation. I was wondering if he could talk a little bit more about or if he had noted any of those highly potential species as already undergoing changes in distribution. I had read a little bit about the Florida stone crab range expanding northward, but I was less familiar with fish species, and so I just wanted to learn a little bit more about that.

MR. PUGLIESE: I think Mike may have stepped off. Todd is still here, and so maybe Todd can address that.

DR. KELLISON: Thanks, Roger. Thanks for the question. I would say that the process that Mike described is not -- It's forward-looking, and it's looking at the potential of a changing climate to affect the productivity or distribution of species, and so it's not an assessment of if, and, if so, how, distributions of species have changed up until now, and so it wouldn't be included in that process, but I would say that's there's lots of evidence along the Atlantic coast that species distributions are changing.

The majority of that has been north of our region, in the Mid-Atlantic and off of New England, because that's where the greatest temperature changes have occurred, and so they have seen some pretty considerable changes in species distributions. There has been some effort to look at potential changes in species distributions in the South Atlantic, and there are very little like broad patterns that emerge, but part of that is because of the data to look at species distribution changes are --

There is more data and more consistent long-term time series in the Mid-Atlantic and off of New England than we have in the South Atlantic, but, where data are available, it doesn't appear that there have been maybe considerable amounts of distribution shifts within our region, and I would

say probably that's because -- If you saw the temperature data that Kevin Craig talked about in his ecosystem status report, it's because, in recent decades, we haven't seen the warming on the continental shelf and shelf break that they have observed in the Mid-Atlantic and the Northeast, but, over the last five or six years, the temperature trends have been going up, and so it might be something that we would anticipate happening.

Then, lastly, I will just say that -- You mentioned stone crab, and I'm not familiar with the data on stone crab, and there is some -- I'm also not familiar with the data on shrimp, but I'm aware of others looking at that, and so there may be some signals that shrimp distributions have been changing in the Southeast, and certainly there is evidence that species in the Southeast are -- They seem to be expanding their distribution, or increasing their abundance, farther north, as temperatures warm there.

Examples for that would be blueline tilefish is one that's been a management issue, because landings have increased considerably, particularly in the Mid-Atlantic, but there are other species, and there are some jacks and maybe dolphinfish, for example, and red snapper, and there are many species that are potentially expanding farther north, but we haven't seen -- We don't have particular evidence that the sort of southern end of their distribution is also shifting farther north. Does that make sense?

MS. CLAIRE --: Yes. Thank you very much.

MS. DEATON: I will just add that there is discussion of species like spotted seatrout, that are at the northern distribution in North Carolina, and get impacted by cold events, would not be as impacted if we have fewer cold events, and so, anyway, that's just one other thing. I think we've got Rita that is going to ask -- Well, Myra is going to read some of -- Rita has two questions, and so go ahead, Myra.

MS. BROUWER: Thanks, Anne. Unfortunately, I think Rita's questions were for Rua, and I don't see him on the webinar anymore.

DR. MORDECAI: I'm still here.

MS. BROUWER: Okay. Rita wanted to know whether partnering and funding includes the land trusts.

DR. MORDECAI: Yes, and, actually, a lot of the folks that use the conservation blueprint are land trusts. We have a significant amount of them, in often two different ways. One way is in kind of the screening of potential parcels for protection or in making a case in funding kind of proposals, and a big percentage of those 245 are from land trusts or kind of non-profits like land trusts, and the other way is often in concern with other state and federal and local municipalities in identifying areas to work together, and so like here are some good focus areas where, as part of these partnerships, we could work together, and so, yes we can always improve -- Because land trusts are such a huge part of what is shaping the conservation future of the South Atlantic, but, yes, we do have a lot of blueprint users that are land trusts.

MS. BROUWER: Thank you for that. Another question Rita sent in is she wants to know how does the blueprint identify oyster reefs, artificial reefs, et cetera.

DR. MORDECAI: The oyster reef stuff, I have to go back and dig in, and so that came from the two fish habitat partnerships on the side area, and so the Southeast Aquatic Resource Partnership and the Atlantic Coast Fish Habitat Partnership, working together, did their sort of estuarine assessment, and it was a couple of years ago, and I think there's even some better stuff on submerged aquatic vegetation and oyster reefs now, and so they worked with a lot of state agency folks and academics and folks, a few years ago, to pull up the best information they have on those particular habitats.

I would have to dive back into the report to refresh my memory on exactly what sources they did, and it was kind of a bigger collaborative effort to grab the best data they had, but I think we're getting more and more -- We're getting better and better data, but I think, especially for stuff like oyster reefs, it's still a real challenge. Some states have really good data, and other states aren't at that same level, but I will have to dig it up. Generally, when the indicator is up and final, we always have the links into the metadata and the reports and things like that, and I can dig that up, if you want to get in contact. If I find it, maybe I can put that assessment in the chat, too.

MS. DEATON: I do know -- I will just add that I know that, in North Carolina at least, we just recently finished the entire coast for mapping the shell bottom, and so that's now available, and we have -- There have been some increased efforts with mapping the SAV too, through partnerships, and so definitely, if you need updates, let us know, and I'm sure other states are ongoing and doing these things as well.

DR. MORDECAI: North Carolina has such great data. I am always so jealous. I always wish I could just like drag some more of that across state lines.

MS. DEATON: I appreciate that.

DR. MORDECAI: Especially like the spawning locations and other stuff in there, and then like the hardbottom. It's such good stuff.

MS. DEATON: We do have artificial reefs maps on our website, for the ones in North Carolina.

DR. MORDECAI: I am just going to put that report in the chat for Rita and others that wanted to see it, and so I will send it to everybody.

MS. DEATON: Great. Wilson, do you have a question?

MS. BROUWER: Wilson put his hand back down, and so I'm not sure if he had a question. There he is.

DR. LANEY: I was talking with it muted. Sorry, guys. I had a comment for Claire, who has asked about stone crabs shifting their distribution north, and I don't know about stone crabs, although I suspect they probably have, but, Claire, white shrimp have definitely shifted their distribution north, so much so that Virginia is now developing a shrimp fishery off the mouth of the Chesapeake Bay and off the eastern shore, and so, if you want to know about that, contact Pat Geer, who is the Chief of the Fisheries Management of the Virginia Marine Resources

Commission, and they have actually published a couple of reports on the pilot shrimp fishery that they're developing up there, and that's pretty new.

They started seeing I guess we would say fishable numbers of white shrimp in I think 2017, or thereabouts, and Lisa might be able to help me out on that, but I think it was around 2017, and so, for four or five years now, they've been able to catch fairly numbers of white shrimp, and they are developing a fishery with small sixteen-foot beam trawls, as opposed to traditional otter trawls, and they are trying to keep it a small-vessel fishery, at least within their state waters, and, of course, offshore, in the EEZ, the large trawlers can still catch shrimp, and, interestingly enough, and Anne and Steve can correct me if I misspeak on this one, but the shrimp landings for North Carolina have also somewhat shifted to offshore, in the last three or four years, and so there is something definitely going on with white shrimp, for sure.

MS. CLAIRE --: Thank you very much. That was really interesting. I will look into that. Thank you.

MS. DEATON: Okay. Well, unless there is anything else, we can adjourn for the day, and we'll start back tomorrow. We've got a full day, from 9:00 to 4:00, and so, if you can log in a little before 9:00, to make sure everything is working, we can start on time. Roger, did you have anything else?

MR. PUGLIESE: No, but just to thank everybody, and make sure you log in early enough so we can make sure to -- We'll do a test, to make sure everybody is online. Other than that, maybe just look at the policy tonight, and that's going to be one of the core areas we work on tomorrow. Other than that, I would just like to thank all the presenters for the significant presentations today and then all the members for really weighing-in and providing a lot of good questions, recommendations, and comments. That's going to help the council advance on all these different areas.

MS. DEATON: Thank you, everyone, and it's good to hear everyone's voice. One day, we'll see each other again, too. All right. With that, then the meeting is adjourned for today.

(Whereupon, the meeting recessed on April 14, 2021.)

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APRIL 15, 2021

THURSDAY MORNING SESSION

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The Habitat Protection and Ecosystem-Based Management Advisory Panel of the South Atlantic Fishery Management Council reconvened via webinar on April 15, 2021 and was called to order by Chairman Anne Deaton.

MS. DEATON: Welcome, everyone, and thank you to the council members that are listening in, and we appreciate that. Today, we're going to start off with discussion about the EFH policy

statement on beach renourishment. If you recall, in the fall meeting, we discussed needing to revisit that and see if it needed any updating, primarily because of new information and what we had seen regarding the increasing demand for beach nourishment, due to more storms, more development on the coast that needs protection, as well as the effects of climate change.

The council wanted the policies to be climate ready, and so this will be the first one that we'll be looking at, and so, to start off and give us some background, we're going to have a presentation by Nicole Bonine on the South Atlantic regional biological opinion document, and Nicole is now with the Corps of Engineers, but she was one of the primary writers for the SARBO, when it was written, and so she's going to give us some background on that, and then that will lead us into -- We're going to summarize some of the information that we heard about in the fall meeting about the Folly Beach Renourishment Study and time-of-year restrictions, and so things are changing with that, as well as the BOEM sand study, and so I'm glad that Doug is here as well, Doug Piatkowski, and he was involved with that, and I would encourage Nicole and Doug to stay on and listen to our discussion about the beach nourishment policy following their presentation. Unless there is anything that Roger or Cindy wants to add now, we can go ahead and move forward with the presentation.

MS. BONINE: Thank you for letting us join you this morning, and Doug and I are always happy to talk about SARBO. Doug, do you want to say anything, before we get started?

MR. PIATKOWSKI: Just hello, everybody, and thanks for the opportunity.

MS. BONINE: Okay. I think most of you are familiar with the 2020 SARBO, at least a little bit, but this is going to be kind of a high-level overview, and certainly stop us if you have questions or think you have a good chat setup, and we'll be happy to answer questions along the way as well, or at the end.

The 2020 SARBO is a joint initiative with BOEM, which is why I asked Doug to be here today, and NMFS worked on this consultation for thirteen years. There was a 1991, a 1995, and a 1997, and they reinitiated in 2007, and, finally, it was completed in March of 2020 by NMFS. That was a long process, and it involved a lot of people, and we tried to reach out to a lot of experts across different areas, from industry to species and habitat experts, and we met with state partners in 2018 in Atlanta, and then, ultimately, we came to the conclusions that you see in the 2020 SARBO.

It's a little bit different, and one of our district reps took this picture, and I thought it was quite telling. The 1997 SARBO is a fairly small document, and it doesn't include a lot of detail. The 2020 SARBO is a much larger document, and it's about 650 pages. Of course, a lot is lit cited and species information, and so it's not all things people have to read to understand, but it's a sizeable document.

Basically, what it is is it's something that covers dredging in the Southeast, and it also includes material placement. Unlike the 1997 SARBO, there's a lot more details about all of those different things. It includes information about the types of dredging that are covered. Under this, it is maintenance dredging of channels, and there is maintenance of other smaller things that would be regulatory, core regulatory, projects, even around docks and marinas. It's also dredging for sand mining for beach projects, and it has some restoration projects, removing -- We call it much dredging, and I guess you would think of things like the Indian River Lagoon, where you're

removing non-natural sediments that have accumulated and are anoxic, and so you're removing those for water quality purposes.

It includes placement, such as beach nourishment, like you guys are talking about today, and nearshore placement. It includes disposal in ODMDS sites, those offshore disposal sites, and upland placement. It includes the transportation of all of that material, considering what would happen as things are moved from the dredging to the placement location, and that's new to the 2020 SARBO.

It includes geophysical and geotechnical surveys, which always occur to understand the depth of say a channel or a borrow site and the changes from the beginning to the end, and so that's now considered for hydroacoustic effects, and it considers what happens to species if you use relocation trawling, and so the actual effects to the species as you're moving them and the things that you do in that process, including tagging and genetic sampling.

It also includes a much bigger area. It has always included North Carolina to Florida, and it now includes the USVI and Puerto Rico, and it more clearly defines that it includes rivers that are used by Atlantic and shortnose sturgeon for spawning. It's a lot more species, and that's kind of the big thing. It now covers twenty-five species, not counting distinct population segments, and it includes critical habitat. There is eight critical habitat units. In the beginning, it was really a sea-turtle-focused opinion, in 1997, with some information also about the whales that were included and shortnose sturgeon. Doug, stop me anywhere along the way, if you want to interject anything.

For the purposes of this, I think that what you would be most interested in is kind of the routes of effects, because those are things that are going to apply to more than just the ESA listed species that are considered in the 2020 SARBO, and it's kind of the way that the Corps -- We'll talk about risk assessment in a minute, but it's the way that the Corps is using the 2020 SARBO to consider effects to everything, to all species, and so this analysis, if you go back and look at the opinion, breaks down by type of equipment and type of activity, by relative effect, that would happen to a species or habitat in the area.

It looks at how species interact with say hopper dredging, for entrainment or impingement, water quality changes that occur around those types of equipment, and more specifically, I listed that it's hopper, it's hydraulic cutter head, mechanical, and agitation dredging, such as water injection dredging. It looks at entanglement, and that's more any equipment that you have in the area, and so, if there are buoy lines that are marking something, we need to make sure that they can't result in an entanglement or death of a species on the area.

It also considers, like we said, relocation trawling, and so this is the catch removing, how those species are handled in that process, and there's a lot more information in the 2020 SARBO about what a protected species observer would do and how they would handle species that they capture, and I know that's a big deal for more than just ESA-listed species under NMFS purview, but it's making sure that those people doing those activities understand how to carefully and safely relocate animals, including bycatch.

It also looks at vessel strikes from any equipment, and not just from the dredging equipment, but support vessels and survey vessels, and it's species interactions with material placement, and so, it's also looking at, as you're disposing of the material, making sure you're not burying any species

or habitat, such as seagrass beds. It's habitat alteration that occurs from both the dredging and the placement, and so it jumps to Number 7, but those kind of are linked.

It looks at whether the way that you're doing construction affects the movement of species in the area, and so are you staging equipment in a way that would block access for something to say access an important area for spawning or sea turtles accessing a beach, and then the sound generated by the project, and so not just from the geophysical equipment, but any equipment that's being used.

MR. PIATKOWSKI: Nicole, if I could just emphasize, on that last slide, the level of detail that went into all these routes of effects is really significant in the 2020 compared to the prior 1995 and 1997. Literally, I think in 1997, it was just very focused on the dredging action itself, and so all of the other components, the interconnected placement action and every other aspect of the scope of the overall operation, was really not analyzed in detail, and so, again, going back to the difference between 1997 and 2020, in terms of how comprehensive the analysis is, I just wanted to emphasize that all of these details, from 2 through 8, really hadn't been considered extensively in the prior documents.

Then one other thing that I just wanted to emphasize is, on the slide prior, when Nicole was communicating the scope of the actions, I just wanted to emphasize, from the standpoint of BOEM's role, we authorize use of sand in federal waters, and so the scope of our action is specific to the dredging of borrow areas in federal waters and then the connected component of placement, as well as the transiting.

MS. BONINE: That's really important, and I would probably even say that the level of effects analysis in the 2020 SARBO is beyond what was even being done in those consultations, when we started this. We really dug in, between the three agencies and all of those others that we reached out to, to not -- To make sure that we did an in-depth analysis, and so we were digging in more than was common for any type of biological opinion being done by NMFS at the time, and it has shaped how biological opinions at NMFS continue to be done now.

Mostly because -- Not that the analysis wasn't sufficient for NMFS, but because this was such a large scope and scale that we wanted to make sure that the effects really were considered on that really cumulative level, looking at what would happen to species if these things were happening from North Carolina to the Caribbean, and was that effect going to be significant or not.

On to the slide of the other major changes, and there's a lot in here, and, yes, it is a consultation that's done with NMFS, the Corps, and BOEM, but it's not a one-and-done consultation. This is something that we are communicating, in some cases, daily still, a year-plus out from that consultation being completed, and we're definitely meeting at least monthly and annually and trying to make sure that we are looking at everything we need to consider for every single project.

We're also reaching out to any group that wants to talk to us, like you guys, and so that's another reason that we really appreciate the opportunity to talk to you, because we want to make sure not only that people understand what the SARBO is, but understand that is, in essence, kind of a living-document approach, and that ties into this next one.

It does have what we call PDCs, project design criteria, that limit the types of projects that can be covered, but that is a -- It's a pretty wide range, and there's a lot of things that you can do under it, and it's kind of a choose-your-own-adventure, as I like to say, and so you could be doing hopper dredging and placement somewhere, and you could be doing mechanical dredging, or you could be doing restoration, like we talked about, but all of that is done under this umbrella of risk-based assessment, and so every single project has to consider what the effects are. It's not that the SARBO just said thou shall do it this way and it will be great.

The 1997 SARBO looked at mostly protection of turtles by having historic dredging windows only in the winter, with the assumption that fewer turtles means fewer deaths, and that's a good assumption, but there's lots of other things that can be considered, and there's now twenty-five species and eight critical habitat units that have to be considered, and so we're working closely, and Anne is on a group that we're working in North Carolina for the next three years, to try to figure out, as we do these projects, who has information that's needed, how that information is used, and how we can continue to make better-informed decisions, year after year, for every single project under risk-based assessment. I see there's already a hand, and I expected that about now, and so I will pause here.

MS. COOKSEY: This is more of a clarification question, and just kind of a reminder, highlighting that, and correct me if I'm wrong, but, when you're using the phrase "considering risk to all species and habitat", you're still -- It's specifically referring to the ESA-listed species, and I'm highlighting that just because of the nature of the Habitat AP, with a focus on all coastal and estuarine and anadromous species, primarily non-ESA, and so I'm just looking for some clarification on the definition, so we're all working with what "all species and habitat" means.

MS. BONINE: Thank you for that, Cindy. I would say the answer is yes and no. Yes, the 2020 SARBO only considers ESA-listed species under NMFS purview, and not even those under Fish and Wildlife, but I would say that, no, the 2020 SARBO is being used by the Corps as a framework to make informed decisions about projects for all species and all habitat, and so beyond those coverages by NMFS, and that's why we're working with so many groups, like North Carolina, to try to understand what other resources, state species of concern, habitat, is in the area, so that we can do what needs to be done under the dredging program for the Corps, which is obviously an important mission, to support ports being open and beaches being nourished, but, in my mind, more importantly, to maximize protection of all species and habitat in the area. Does that answer your question, Cindy?

MS. COOKSEY: It does, but I think it highlights a discussion that we may have to deal with as an AP, in that, even though this was specifically a bi-op for an ESA species, we're hearing that the Corps is using this for all species, and maybe, during this presentation, you can address any input that you received specifically related to non-ESA impacts that might justify that approach, because that's likely to be a topic that we will be discussing later that may make us look at how we need to work on our policy to try to deal with that approach, if that makes sense.

MS. BONINE: Yes, and so, obviously, the analysis in the 2020 SARBO is specific to those species and habitat. I guess what I'm trying to say is that the framework, using risk assessment, is what the Corps is using to consider effects to other species and habitat, and so it's kind of this new approach of not looking at static decisions, but trying to figure out, in a more holistic way, what

effects are at a project-level basis, but also what they are at an ecosystem-level basis across the South Atlantic region.

We know that there's projects that occur from North Carolina to the Caribbean, and so, as we're looking at that suite of things that need to be done in a year, we're trying to figure out, with input from anybody and everybody -- I mean, we're trying to make sure we're using best available data, but to try to make sure that we're planning those projects in a way that they're most protective of the things that need to be protected. Does that explain it a little bit better? I know this is a big issue, and so, if we need to pause here for a while, I'm happy to do that, or I can finish and then we can come back to it.

MS. DEATON: I think that we should -- You only have a few more slides, and why don't you go through the rest of your presentation, and then we'll get to questions.

MS. BONINE: Okay. That sounds great. The 2020 SARBO, being more specific now to the ESA-type stuff, it does have -- Those project design criteria are set up so that they are by maybe equipment type, things that you need to do for equipment or what a protected species observer needs to do when they're handling species, as we discussed earlier, but it's also a lot of species-specific PDCs.

There is a North Atlantic right whale conservation plan that the Corps put together and was included that changes kind of how this is done, in the way that it emphasizes that we need to protect right whales in areas where they're calving, and to do that would be to minimize traffic, to the extent possible, for those projects that have a lot of vessel traffic travelling from the shore to an offsite area, and so that would be from a borrow site to a beach or from a channel to an ODMDS placement area.

There seems to be confusion on this, and I know it's been high profile, and so you may have seen a lot of things about this, and it's not just the hopper dredge, and it's not just the survey vessels, and it's all the traffic. It's all the support vessels, and so we're really trying to make sure that, when we have mother/calf pairs down in especially the north Florida and south Georgia area -- There's only a hundred breeding females left, and we have a few deaths every year, and we had no births a couple of years ago, and we're trying to make sure that we're being as protective as possible in minimizing any vessel traffic in that area.

With this conservation plan, the Corps also committed to spending over a million dollars a year to expand aerial surveys for right whales, and so, right now, from the 1997 SARBO, the aerial surveys were limited to that north Florida and south Georgia area, and these aerial surveys now extend into North and South Carolina, and there's a lot of great research coming out and that collaboration with researchers, to try to better understand when and how they're moving and to be able to communicate their location to not just Corps vessels, but all vessels, to minimize risk to that species.

ESA-listed corals, there is PDCs specific to that, and I know you guys deal with a lot of stuff in southeast Florida, and so there is a lot of -- The right whale and coral were probably two of the most difficult parts of SARBO to complete, trying to figure out the best way to do it, and we did work with the Habitat Conservation Division a bit on trying to figure this out, and all the literature

available, to try to make sure that the turbidity and sedimentation from dredging does not affect coral or hardbottom.

Then, lastly, the Atlantic sturgeon ones, this is a completely new area as well, and it's trying to figure out, if there are areas in a river where sturgeon are spawning, that water quality changes would be detrimental, and if they are aggregating in areas that we need to protect, and so there was a lot of work done on trying to figure out -- Looking at water quality data, to make sure that, if rivers naturally have low DO in certain areas, and there is deep holes, and sturgeon are congregating there, that we're making sure to be protective of those areas.

The last of the major changes is supersede, and so this is something that actually came out in another programmatic for the Jacksonville District, but it is a concept that all of these PDCs are very specific, but you can't ever define every single thing that you're ever going to need to do, and so supersede allows for certain projects to be able to still be covered under the 2020 SARBO if the effects, and this is the important part, the effect of that change is substantially similar to the effects considered in the opinion.

There might be something that's just a little bit different, but it still could be covered if NMFS reviews it and determines that the effects are still going to be the same, and, for the 2020 SARBO, the supersede process was expanded to include potential additional equipment use, and the intent here is to encourage innovation in the dredging industry, and with other partners, to figure out if there are better ways that we can do dredging and material placement with fewer effects to species and habitat. Things that are being considered are is the use of tickler chains on a hopper dredge drag head something that would maybe alert species sooner of their presence and be able to avoid an incident.

MR. PIATKOWSKI: I just wanted to emphasize, on the PDC piece -- I just wanted to make it clear for everybody in the audience that the PDCs is everything that was -- Just about everything that was from the 1997 opinion, in terms of the old reasonable and prudent measures and terms and conditions structure, and that has been absorbed into what is now called PDCs, and then, on top of that, even more criteria, based around the information that we've learned over the last twenty-three years.

I think something that a lot of folks don't understand that was integrated into this document, and is going to be integrated continuously in this risk-based approach, is we've learned a lot over the last twenty-three years, and beyond, and just dating back to the 1997 opinion, at least, on what those risks are, in terms of operational components and how the operations occur in different locations and what the risk is for each.

I just wanted to emphasize that PDCs include everything from the prior terms and conditions and prior bi-ops and more, and, again, it's based around just an extensive amount of information we've learned from both published documents, gray literature, and then just internal kind of localized knowledge about the different projects.

MS. BONINE: Thank you, Doug. That's really important. The incidental take statement may not be as important to most of you, but to some of you it certainly is, and so one thing that's been more confusing than I guess we anticipated is that the take is based on a three-year consecutive time period for most of the species, those shown in the top box. It's an even longer time period for

those in the lower boxes, especially coral, and it breaks down what we see and what we don't see, observed and unobserved.

The 1997 SARBO would have had take that was unobserved, but it's just, at that time, NMFS didn't more clearly state that and say we acknowledge that there is this, and, based on the available data -- I mean, it's using a 50-50 ratio, basically, for most thing, but it's probably not that high. We probably do observe more things than this accounts for, but it's just really kind of confused people, because the numbers look much bigger, looking at them for three years, and they look even bigger if you take into account observed and unobserved, and people have really been caught on the fact that the number went so much higher from the 1997 SARBO to the 2020 SARBO by adding observed and unobserved, which really isn't an accurate comparison.

For instance, loggerhead sea turtles, there is 107 observed lethal takes anticipated over a three-year time period. Divided by three, that is the exact same number, thirty-five, as was considered in the 1997 SARBO, and so, even though this is now covering more area, more projects, more activities, the amount of take anticipated is the same, and, in reality, the Corps has never reached that thirty-five number.

The highest that they have ever had was eighteen in one year, and so the numbers are scary, when we look at them big like this, and maybe we should have divided them back down by a one-year time period, but the thought was three years makes more sense, and that's what is done in fisheries, because there is so many strange things that can happen, cold years, warm years, hurricanes, and I'm sure you guys have talked about many of these things, and so I just wanted to point that out. Though these species aren't necessarily specific to what you're talking about, this is something that has been a major point of concern.

This is basically the last slide, and Cindy had said this might be something that you guys are interested in, and it's definitely something we're interested in, and all of this, this 2020 SARBO, is built on best available data, and that's what the ESA says you have to do, and, unlike the 1997 SARBO that was static, the available data continues to change over time, and so we need to make sure that we're making informed risk-based assessment decisions based on what we know.

The Corps has started to do more research, trying to figure out the effects, especially related to water quality changes, turbidity, and sedimentation, in different areas from different types of equipment, and, as you know, there's a lot to do with the hydrodynamics of the area and the sediment type, the equipment type, and so trying to piece all of that together is, of course, a difficult thing to do. There is a fairly long analysis in the 2020 SARBO that lays those things out.

Since then, ERDC, the science branch of the Corps, has done testing in Savannah, Charleston, and Wilmington, and those were smaller studies that were mostly a couple of days long, looking at different equipment types and trying to determine if there are water quality changes or DO changes. None of those observed anything notable, but they were very small studies, but there's a much more robust hydrodynamic and water quality study ongoing right now in Port Everglades, which will help to inform --

That was around an operation and maintenance project there, but it will inform, if deepening or widening projects occur in southeast Florida, how hydrodynamics and equipment type and sediment types affect any of the surrounding habitats, be it seagrasses, reefs, or coral, and there is

a three-year coastal consistency agreement in North Carolina to do deep-draft dredging in Morehead City and Wilmington, outside of the historic window, and the agreement is that there are a number of agencies working together in North Carolina to understand those effects, and part of that is going to include a lot of hydrodynamic and water quality studies being done in the Morehead City and Wilmington area. Doug, did you want to talk about sea turtles and mantas?

MR. PIATKOWSKI: Sure, and I just wanted to emphasize, for the folks on the phone, that, also, as a part of this kind of ongoing research, BOEM has a research arm as well, our Environmental Studies Program, with a significant budget every year that we put -- It's basically data gaps that we identify in our different program areas, and we invest in the science and apply it toward decision-making, and so, throughout the last thirteen years, we've been learning and developing the SARBO, and there's a lot of still data gaps remaining, and we have some active studies underway that I just wanted to mention, both looking at sea turtle behavior and manta behavior, specifically in the Gulf.

We've got a multiyear study, working with the USGS, looking at sea turtle behavior and fine-scale behavior activities in the Ship Shoal vicinity, which is a shoal in the Gulf that has a lot of dredging activity. We've had many projects where there were hundreds of turtles relocated, with either zero or one lethal take, and so a lot -- There's a lot of animals in an area where the dredging is occurring concurrently, and the risk is still relatively low of entrainment.

What we're trying to do is figure out why, by putting -- Taking advantage of the new tagging technology that's out there and tagging as many turtles as we can, to look at very, very fine-scale behavior movements, in and around the project area, and so that study is ongoing, again working with the USGS and Kristen Hart.

We also have another study that's underway. Through the SARBO development process, we learned about the risk of capturing giant mantas as a component of the relocation trawling efforts to minimize sea turtle take, and we realized that that is a problem and that we need to figure out how great of a risk it is and what projects, throughout the region, may have encounters with giant mantas when using trawling activities, and so we've got an ongoing project with the Georgia Aquarium right now that's going to be doing a lot of fine-scale behavior tagging on giant mantas in the vicinity of Canaveral Shoals.

Then, also, we have an active study that we're getting ready to start off that's going to be looking at specifically the efficacy of relocation trawling. We've done it for years, and it's been a part of projects throughout the South Atlantic, as a tool to mitigate risk to sea turtles, but we actually still, to this day, don't know the exact efficacy of that operation and what the risk may be to other animals, and so, again, those are just three examples, but the point I wanted to make is, through the development of the SARBO and looking forward, in terms of what the data gaps are that still remain, we are doing our best to fill those gaps.

MS. BONINE: Thank you, and, actually, before I get to the last one, that's more of an industry one, I want to add another thing that the Corps is working on right now that I think is going to have a big impact, and it's mostly just data management, and not necessarily a specific study, but ODESS is the online database that the Corps uses to publicly display information related to take associated with dredging.

The system replaced the sea turtle warehouse, back in the day, and it certainly was an improvement, but there was a lot more improvement that could be done, and so there was a second version of that system that is being beta-tested right now at Bogue Bank in North Carolina. It's going to be a tablet app that the data is going to be recorded real-time, everything that is observed, and it will note the GPS location at the time that a hopper dredge tow begins, and so it will be a start time and end time, a geophysical location, and it will be recording the incidence, the weather, the bycatch, and then the sister product is for relocation trawling, which has never been digitally recorded.

All of that information also will be recorded on an app, and that will be on a phone, so it's smaller to stick in someone's pocket when they're on a trawler, but being able to have that data and have it spatially displayed on the new ODESS Version 2 is really going to help with risk assessment, to understand where take occurs, and it will display by month, by area, by region, to show where the biggest concerns are, and it's going to -- We have worked really closely with different states and different partners and NMFS in trying to make sure that we're accurately collecting bycatch, so that things, like when a giant manta is listed, we know, historically, how many captures there had been, or, if there's a state resource of concern, such as blue crabs, is it something that's being caught in trawling nets, and when and where and how much, and so we're really looking forward to that coming out, as soon as the beta testing is done, and so hopefully that will be done this year.

We also are having all the historic trawling records digitized, and USGS has agreed to do that as well, to help us, and so hopefully we'll get all of that into the new version and be able to roll it out and have a better understanding of the effects from hopper dredging and trawling.

Then, for the industry portion of it, the industry is very interested in trying to reduce take as well, and they're looking at different methods of doing that, whether it is, as I said, earlier tickler chains, which is just of chains that hang off the drag head that might stir up something ahead of it, so that it avoids an interaction with the hopper.

They have considered lighting or water, again like a tickler chain, to spray and move things. There was a study done that green lighting deters turtles, and so they were trying to decide if they need to put lighting on the end of a drag head, if that would change it, and somebody even was considering whether or not the shape of a shark, a shadow, would scare things away, and so I'm not sure what's going to come of any of these, but just letting you know there's a lot of people putting their heads together and trying to come up with creative solutions, and so, if you have ideas on that, I would love to hear those as well, and I think that's it.

I put a link to the current SARBO, and it was updated. After it was released, we updated some clarification on single being sonar, and it will probably continue to be updated, and so, whatever copy you have, we always suggest that you go to the NMFS webpage and get the current version.

MS. DEATON: Okay. Thank you, Nicole, and thank you, Doug. I want to open it up for questions in a second, but I did want to clarify that I forgot to ask if there was any public comment at the beginning of the meeting, and so why don't we go through the discussion with this presentation and questions, and then we'll have public comment, for anybody who is on the line that wants to give public comment. Go ahead and start, Wilson.

DR. LANEY: Thank you, Madam Chairman. Nicole, I think it's highly commendable that the Corps and BOEM, and I guess National Marine Fisheries Service, since they prepared the biological opinion, attempted to basically conduct a programmatic analysis for this opinion that covers a very broad range of geography and a high number of listed species, twenty-five, as you noted.

I guess my concern, and a lot of my colleagues share that concern, is that the replacement of environmental dredging windows, which we know are successful, in that they avoid the impact, which is the first measure that is required, at least in the Fish and Wildlife Service mitigation policy, and the proposal to replace that with this risk-based adaptive management approach.

I know, with respect to the North Carolina project in particular, the ASMFC wrote a letter, and Lisa could address that in more detail, expressing their concern that, if the Wilmington District proposal to make that paradigm shift, I think you have couched it in, is implemented, that other Corps districts may elect to follow suit, and, in fact, in the response to that ASMFC concern, in Appendix E on page 8 of the Corps EA filing for that proposed North Carolina project, the Corps states that their intention is to eliminate environmental dredging windows for all Corps districts.

My question is whether or not the Corps, given that is their intent, and given that you just told us that the SARBO is being used by the Corps, not only to address endangered species, but also to address non-listed species, what sort of analysis has the Corps done to analyze the cumulative impacts of that proposed paradigm shift from eliminating environmental dredging windows to going to a risk-based assessment approach? Thank you.

MS. BONINE: Okay. Wilson, I share your concern, and as does NMFS, BOEM, and the Corps, all of us, as we were going through this process. You're right. I mean, how do you balance twenty-five species, and, basically, how do you balance the Corps need to dredge and place material and protect the environment? I mean, that's the crux of the question.

The windows were considered effective for sea turtles, but there are other ways that you can be protective, and there is more than just sea turtles at question here, and it's the entire environment, and so most of what we're seeing, actually, right now, in terms of take, even during the historic windows, half of that is Atlantic sturgeon. We just did Kings Bay, and there were eight lethal captures, and that was four Atlantic sturgeon and four turtles, but the four turtles were three different species.

That is something that is not being looked at as much right now, and so we're trying to figure out how do you do this in a safer way, and we're not saying that dredging will never happen in those historic windows again, but we're saying let's look at every project individually and consider the risk, and what's the equipment that's going to be used, what's the habitat in the area, what are the species that would be there when you were going to do it, other ways that we can minimize that risk, and can we make sure that we've checked with state partners and others of concern, to make sure we're considering all of the things, and then let's look at it on a regional scale and figure out that, well, maybe if that's really a concern for this project in this area during this time period, can we do dredging somewhere else during that time period that it isn't a concern, so that we can come back and have available resources to do it when it is a concern in that area, and so it's taking a much more ecosystem-level approach. I know you have your hand up again, and so let me finish.

The other concern that I've heard, in North Carolina and Georgia and other places, is, well, what happens if say the thirty-five loggerheads allowed per year all are taken in my project. That has never happened, and the Corps has never managed a program that way. Every single risk assessment is not just what's considered -- As I said, how are we going to do this safer, but it's an ongoing process that happens after every single capture, and I say "capture" intentionally, because it may be relocation trawling captures as well.

What happens when there is the lethal or non-lethal take, and what is the effect to those species from doing that from that capture, and should we continue, and, time and time again, throughout the dredging program, the Corps has made the decision that, no, we can't continue.

When I was at NMFS, I watched that happen quite frequently, and I will use Tampa Bay as an example. I think it was three years ago, and they were doing dredging in the entrance channel and relocation trawling. It was, I believe, in December, and there was a cold snap, and so that was during a seasonal window that people would consider safe for turtles, and there were five turtle takes in six days, if I remember correctly, and the Corps said, no, we can't do that, and they stopped the project, and it cost $2 million to end and remobilize that project at a different time, but that was the right thing to do.

Interestingly, with that project, there was also relocation trawling happening that captured three smalltooth sawfish, which was never expected by anybody, and researchers were called out, and sent out as fast as they could drive out there, to do trawling, or to try to do captures, to figure out why smalltooth sawfish were in the entrance channel in Tampa Bay in December, because that just was unheard of.

These species don't tell us when and where they're going to be, and things happen that aren't expected, even during historic times, and we've had lots of problems with things at different times, and we're trying to figure out are there more things that can help other than just time, and there ways that we can reduce all take at a time and a place that works better, project-by-project. Doug, do you have anything to add to that?

MR. PIATKOWSKI: Yes, and, I mean, we can, obviously, have a conversation all day about it, but something I would just add is it is not easy, right, doing tradeoff analyses for all these different species, both ESA-protected species, fisheries, et cetera, but that's kind of where we're at, and, I think, back in the day, the window was purely kind of arbitrary, in the sense of assuming cold-water periods is when turtles wouldn't be present and low biological periods.

By kind of looking at things holistically, and then, on a project-by-project scale, balancing those tradeoffs, that's that paradigm shift that you mentioned, Wilson, and is it easy? No, but, in some cases, it's absolutely the right thing to do, because we have plenty of projects, over the last twenty-some years, where, even within those windows, we knew, during the immigration period of turtles coming into the sound, for example, in the tail-end of the window, always high numbers turtles, and, just because those windows were in the old opinion, it didn't actually mean that it created a low-risk situation.

Now the challenge on everybody, both BOEM staff and Corps staff and other external partners, is to really look at each individual project on its own and balance the tradeoffs between impacts to larvae, impacts to sea turtles and sea turtle size class and right whales, and that is definitely

difficult, and there is no win for any one species, per se, and it's a balance of tradeoffs among all and trying to make the best decision.

One huge part of the SARBO that truly has never been done is creating a process for documenting lessons learned after each individual project and putting it into a database that anybody can access that's a decision-maker in both agencies to inform the next time that project is done, so we're constantly learning, and I think that's a really important point that everybody needs to be aware of.

MS. BONINE: I would also add that, unlike the 1997 SARBO, there is different options in the 2020 SARBO, including relocation trawling and bed leveling, and bed leveling -- It seems like a fairly minor thing, but, when you look at take, especially with sea turtles, it typically occurs towards the end of a project, when there's a lot of ridges and valleys left from the hopper dredging. Projects that we can end sooner and not have to continue to hopper dredge, and we can use bed leveling to just level that out or push out the remaining high spots, that means that projects end a lot quicker, and we don't have to continue to dredge when it's the highest risk to sea turtles and sturgeon. Okay. There's a ton of questions that I see, and so I guess I will pause.

MS. DEATON: Okay. Wilson, did you have another question?

DR. LANEY: Yes, I guess I do have a follow-up, Madam Chairman. Nicole and Doug, I appreciate the additional information that you provided in your responses there, and I'm trying to figure out how to proceed here. So one thing that you both have indicated is that you are trying to do this risk-based assessment on individual projects, which I think is certainly a good thing.

I will just say, and then I won't pursue it any further, that, based on the reviews that I and some of my colleagues have done on the Corps EA findings for the North Carolina project, and I believe the same is true, but I will leave it to my Georgia colleagues to say, but also for the Brunswick Harbor deepening project, and I didn't see any sort of risk-based assessment analysis that I thought was sufficiently rigorous to develop an approach for reducing risk that would be as effective as environmental dredging windows, and so that's my first comment.

Then I will reiterate the question, or at least the question that I thought I asked, which is whether or not, given that the Corps proposes to make this paradigm shift from environmental dredging windows to risk-based assessment, the Corps has done what I would perceive to be a required NEPA analysis that covers the entire geography, and I haven't seen that, and so, if it exists, would you please point us to it?

I don't think that the NMFS SARBO, in and of itself, or at least my perception is that would not meet the Corps' obligations, and possible BOEM's obligations, for considering the cumulative impacts of such a paradigm shift throughout the entire South Atlantic and Caribbean geography, and so that was my initial question, and I don't think you exactly answered it, but I will let you respond, and then I'm going to shut up, Madam Chairman, even though I have a ton more questions, and let my other colleagues jump in there.

MS. BONINE: Okay. There were quite a few things in there, and I'm trying to figure out how I make sure I don't forget them. The NEPA question, because that's the one that was part of your first question, NEPA is specific to -- First of all, the NMFS biological opinion does not require a

NEPA. The analysis in the 2020 SARBO does consider the effects of shifting outside seasonal windows, and it does call out certain specific areas, such as Brunswick, and what would happen to all species by making those seasonal switches.

There are certain -- I am not an expert in all of the state regulations, and so I can't answer specifically to all of those, but there are certain scenarios that require an updated NEPA, and there are certain ones that require updated coastal zone consistency, and so on and so forth, and so the Corps is working through that process, to do what is needed for each of those situations.

Risk-based assessment is -- What you have seen in the two documents you listed is not the extent of risk-based assessment, because it is a living document approach, and so we are continuing to review and document how all of these decisions are being made, leading up to the beginning of these projects, and we'll continue to do so through the course of the project, like I said, as everything happens, whether it's a capture, a take, information that we get from another source about things that are happening in the area, and then it will be a lessons learned at the end.

The Corps has offered -- Well, the Corps and BOEM are required to do an annual report with NMFS, to do a wrap-up of everything that was decided, decisions that were made and lessons learned and take that occurred, and to consider if there's new information that needs to be considered going forward, and that will be done at the end of the FY, and the Corps has offered, for those who are interested, to have those conversations, at the end of the year, about things that have happened and decisions that were made and lessons learned, but there isn't a specific document to point to right now that is a thesis of all the decisions that are made, because it is an ongoing iterative process right now. I think that -- Doug, did you have anything else? I was trying to keep track of all the questions, to make sure I answered them all.

MR. PIATKOWSKI: I think that -- I don't have anything more to add.

MS. DEATON: Okay. Cindy.

MS. COOKSEY: I wanted to thank you for the overview that you provided to us, and I just kind of want to give a reminder that we asked you to come to speak today specifically to answer questions -- We asked you to speak today to answer questions regarding SARBO and provide us an overview of SARBO, and I do want to try to keep questions related to that document, as much as possible, and I think, given a lot of the questions that we're getting, it might be worthwhile to try to plan a return of you, Nicole, and potentially Doug as well, for our fall meeting, so that we can really potentially have an in-depth discussion related to the Corps and coastal dredging and environmental windows.

This forum may or may not be, currently, the best place for that, and I also did want to highlight that NMFS is not supportive of giving up the environmental windows, that they are a critical component to addressing protection of our fisheries resources, and the SARBO does not take the place of the EFH consultation process or coordination and consultation under the Fish and Wildlife Coordination Act. Now, to get back to my question that is specifically related to SARBO, which is how did climate change, or climate vulnerability, factor in, in any way, in the development of the SARBO?

MS. BONINE: Thanks, Cindy. I know the SARBO is very contentious, and there is a lot of concerned people out there, and so I do appreciate that, and we're happy to continue to talk as we go through this. I mean, we really want this to be a collaborative process with partners, to make sure we have the right information.

You're correct that this is a NMFS Protected Resources Division consultation, and it is not an EFH consultation, and so I want to be careful, when we say NMFS, that we're clear about what part of NMFS we're talking about, but, to you climate change question, I would say that it played a pretty big part, in that we keep finding strange things happening with species in places and times of year that we don't expect.

It's another reason that a static decision didn't seem appropriate, and we need to be able to handle things as they happen in the area that they're happening, and so, if things are moving north or south at different times of year than they used to, or their prey availability is in a different location, or there is different stochastic events happening, or storms, all of those things play into that risk assessment, and so that's being able to adaptively manage to the changing environment. Doug, do you have anything else for that?

MR. PIATKOWSKI: No, I don't. I don't have anything else to add. I just think we're just in the first year of trying to implement the SARBO, and so a lot of things are evolving, and how the approach is being taken for this risk-based analysis -- It evolves every day, and it should, because the old model -- I worked for years operating under the 1997 opinion, and I understand that certainly there were other resource categories that leveraged the ESA windows to their benefit as well, but I think, at the end of the day, windows are a mitigation tool, and a dictated window -- Historically, it was 1 December to 31 March, and that doesn't always actually make sense, like I said earlier, based on species movements and presence in any given project location.

I think -- I don't think it's a fair statement to continue to speak to windows as if it's a used to be and now removed kind of situation, but windows are just one of the many, many tools that are in the toolbox to mitigate risk, and that window may exist in some channels, and it likely won't be 1 December to 31 March, and it might be something completely different and adjusted based on what we learn about the individual species movements and behaviors at any given site.

I would say, like we talked earlier about, in terms of the research that we're currently doing, I think it's a great time, right now, to be thinking about what those data gaps are and what research strategies should be laid out to address some of these questions that folks have, and certainly something that the management council could do is begin thinking more in terms of what those research strategies should be to address some of these questions that are being asked.

MS. DEATON: Thanks, Doug. It seems that the SARBO is supposed to be a programmatic biological opinion, but it -- If it falls back to case-by-case risk-based assessment, then it really isn't a programmatic BO.

MR. PIATKOWSKI: I will answer that, real quick, Nicole, and then you can follow-up. I think there's a lot of things, like Nicole mentioned, that go on on a daily basis, internal within all three agencies, and so I would argue that it is programmatic. What we do, whether it's a take or a scenario or having to plan when to dredge, when any given location is discussed, it's discussed in

the context of the cumulative footprint of what other actions are underway throughout the region and what's happening in those other activities.

I know, at the surface, looking at the document itself, it doesn't communicate all of that kind of active collaboration that's going on, but certainly every decision that's being made is in the context of all the other activities that are happening in the region.

MS. BONINE: A programmatic opinion is always a suite of options that limit the type of work that can be done under the project, and it shapes the bubble in which work can occur, and so we're still staying within that bubble, and we still have say take limits that occur throughout the entire region, but then how you navigate timing and equipment and the other things about a specific project, how you decide which of those PDCs to use, that's the risk-based management approach.

I mean, it's kind of a new way of looking at a programmatic, and I think, if anything, all of these questions and concerns show why that's needed, because there is so much that changes, through climate change and through new species and through other resources in the area, that you have to be able to be thoughtful about how you're doing things and see if there's better ways that we can do them.

MS. DEATON: All right. That's fair. Thank you. John Ellis, do you have a question?

MR. ELLIS: I do, but, as Cindy mentioned, this is more about the SARBO than the dredging windows, and maybe we can have a fall presentation about that, because I would love to hear more, and so I will just say that I would love to hear more about it, and so I don't really have as much of a question, but I would like to hear -- If they do something in the fall, I would like to hear more of how the Corps is looking about going and putting these specific, or data-driven versus the arbitrary, I think I heard was the term, windows for when biological activities are or not, and, also, we may have some discussion on whether or not there needs to be some outreach to folks.

For instance, when you read that the Corps was looking at doing away with the dredging window for Wilmington Harbor and Morehead City, it doesn't say make it more focused for when the turtles are actually exposed, and it's more of we're going to do away with the window, and so some discussion about how to deal with the way the politicians and other folks may be -- What they may be hearing, and so no question, but I would like to hear some more in the fall on that.

MS. BONINE: That EA came out pretty early after SARBO was completed, and it was started before, and there is certainly -- There could have been a better job explaining some of those things, and I will just say it that way. It has led to, I would argue, a good thing, that there is this now partnership being developed with many resources and involved concerned partners in North Carolina to work through these issues and to figure out, once and for all, when and how and where we can do things better and what is of concern in the area.

When you start doing all of these things sort of in individual bubbles of ESA under NMFS, ESA under Fish and Wildlife, and EFH, you get to a situation, which I think was happening in North Carolina, where there is so many restrictions to protect things that there's not a good time to do something, and so now it's taking that maybe harder look and saying what are our real concerns, what's the route of effect, and is it turbidity during a certain time of year, sedimentation, burial of

eggs from fish in a certain area, blocking a spawning run of something, blue crab spawning in an area, and like what is the real concern, and how do we handle all of that better?

Under that umbrella of climate change, it may not be static, and so how do we do that every year better, and with planning for dredging that is often done years in advance, and it's taking this thing called the 2020 SARBO and the framework of risk assessment and saying, okay, now that we've laid this out there, can we use this to work with partners and improve the whole program, and change is hard, and so we fully understand and acknowledge that, and that's why we're talking to you and everybody else, because we want to start pulling people in and looking at things at an ecosystem level approach.

MS. DEATON: All right. Thank you, Nicole. We have a question from Paul Medders from Georgia.

MR. MEDDERS: I'm a Georgia representative, and I'm sitting here looking out, from my office window, at Brunswick Harbor, and this is an issue that's really important to us. I have a comment, I guess, and then a question. First, Doug and Nicole, the presentation -- Being someone that has not been really read into this issue, I appreciate the presentation, and I think some of the folks in our area that have been really up in arms about this would benefit from a presentation, and I keep hearing a theme of the word "balance", and I think about that word balance in our mission statement as something that we strive for, and so I understand you're looking at the whole approach.

As you know, our main concerns are from a protected species perspective, and, actually, the folks from my organization that do that are a little bit separate from me, and so that is not my area of expertise, and I just wanted to point that out, that I think Wilson hit on this very well, and he could have done a much better job with this than I could, but the fact that, when we're speaking of sea turtles, it seems that the dredging windows have worked, and it seems to -- Our folks, I believe, the issue is to balance between right whales and sea turtles, and the point was made to me that we have not seen an interaction with right whales, but we know that we're going to have interactions with sea turtles.

I think their concern is that, locally, our population has increased enough that sea turtles are doing so much better than they were in the early 1990s and that we're going to see even more interactions, and we do have the federal consistency issue with some of the state laws and our federal consistency coordinator -- I know you all have been in contact, and I have seen the draft letters, with some of the comments, and I have seen the letter that's written by the Southern Environmental Law Center and some of the points that they're making.

I know you know this, and I just wanted to go on the record saying that it's something that's really important to us, and then I guess my question is, when we think about how these individual risk assessments, like you were speaking specifically of dredging the Brunswick Harbor here, and at what point is that risk assessment done, and when would our folks be seeing it, so they would know whether they're going to be comfortable with it, and I think they had that question too, of, when we reach the thirty-five-turtle threshold, what happens then? I think their thought is that that's very likely to happen, and happen quickly, if we have summer dredging in the Brunswick Harbor, and so is that a clear enough question?

MS. BONINE: Sure. I think I'll start with the first one. We're not going to take thirty-five turtles at Brunswick. It's not going to happen. The thirty-five turtles is what is estimated for loggerheads for one year, and that's for every single project, and that's all of these projects we're talking about, and it's things from North Carolina to the Caribbean.

I mean, if you just talk from a standpoint of maintain a dredging program, it's unrealistic to think that you could use all of your take, which I hate that term, but that you would use all of your take on one project. I mean, you just can't do that. You have all of these things that have to be maintained and ports that are absolutely necessary for commerce for our country and Kings Bay that's maintained for national security, with the naval base, and, I mean, there's no way you could use all of that take at one project.

The reality is that the highest number of loggerhead takes that have ever occurred, since 1997, in one year is eighteen, even though the Corps has always had thirty-five. This is about trying to find better ways to do this so that we have even less take, cover more projects, do more work that needs to be done, and continue to reduce that take, and so I keep hearing that. Like you said, all these groups that are saying that, it's not realistic, and nobody would want that to happen, and that's why I talked about there's projects that have been shut down before.

I mean, if we start seeing something happen, and it's happening fast, I'm the person they're going to be calling at three in the morning. Every single time there's a take, I get knocked out of bed, and we're having those conversations and elevating within all the agencies, and we're just not going to let that happen. We can't give you a specific number, because it's different for every project and every scenario, and the ones that happened that I mentioned in Tampa Bay that happened very quickly, in a couple of days, that's one scenario. There might be five takes that happens on a project over three years, and that's a different scenario, and then, with every take, there's going to be the question of what you can do to minimize that risk from happening again.

We have a lot of really technical equipment, for instance, on dredges, and it's called DQM, and we're monitoring, nearly in real-time, how the dredge is operating. Is it doing what it's supposed to do? Are they turning pumps off when it's not embedded in the sediment, so that they can't entrain a sea turtle? Is the drag head deflector working properly? Do we need to use relocation trawling, which we're going to do at Brunswick? What happens when we start catching turtles in Brunswick? If they're gravid females and it's a non-lethal take, that still might not be a good thing, and that's something we're going to be monitoring every time too, and so I understand.

I really do understand the concern, and none of us want to see turtles killed, and I know that's the statement that I keep getting quoted on in all of these articles that you've probably seen, but it's true. I mean, none of us went into this -- The people working on this are all passionate biologists too, and we want to work with all of our partners, to make sure that we're thinking about everything correctly, but, as far as seeing the risk assessment, I mean, as Doug said, we're still working on it literally every day for every project, and we'll continue that process through these projects, through to lessons learned, and then continue that do-loop over again for the next project, and so it's not something that we can say, here, look at this, and this will convince you that it's okay.

There is so many variables, including climate change and all the other things we've talked about, that it's a decision process that's a daily decision process on how to do this and when and where,

and what happens on day-one in Brunswick will inform what happens a month later in a different area, or a year later, and so it's not a static decision.

MR. MEDDERS: I can appreciate that. You all are in a difficult position, and I understand, and we as resource managers here, on totally different subjects, get put in those difficult positions and get questions about why we do things, and so I do fully understand that, and I respect that. I do understand that you all are -- We all have the same goal in mind, and I do get that, and so I do appreciate it.

I think that the risk assessment will help, and I do understand that, if things turned bad, they will get closed down. I also have to tell you that I do understand that word "balance" in our mission statement is about protecting the natural resources and the economics, the economy, and we have to have the channel dredged, and we have to have national security, and I do hear that, and I just -- I think those concerns of what some of our folks are feeling are the federal laws, the federal changes, that we're seeing are consistent with state law, and I think that's what you're going to hear from them. I think, for some of those folks, hearing from you directly would be helpful, and I do appreciate the clarification and the presentation, and I would like to hear more.

I would like to see one of those risk assessments, and we're talking about two very specific species, and our folks are balancing right whales and sea turtles and not even considering all the other species, sturgeon and some of those, and, admittedly not being familiar with dredging, it puts me at a little bit of a difficulty, but I'm the guy that sits on the committee, and so I do appreciate you answering me, but I just felt that I had to go on the record, after my director sat me down and told me that these are the things he's concerned about, I had to say them out loud, and so I have done my job.

MS. BONINE: I appreciate that, and we can continue to talk to groups such as this, and others, and we met with the Jekyll Island Authority a couple of weeks ago, and I've had continued conversations with them and with the Sea Turtle Hospital. We've met with Georgia DNR, and we're meeting with groups in North Carolina and, any other group that wants to talk, we're certainly willing to have these conversations and make sure that we're sharing the right information, and, more importantly, we're getting the right information from you.

I mean, if there's anything we should be considering, we definitely want to know that, and, as we've said again and again today, this is going to be an evolving process, and we're -- We could start Brunswick and, theoretically, stop two days later.

It is possible, and I don't know. I mean, we're going to have to look at it every single day, to see what is right and if it works, and, if it doesn't work this time, and we can't complete the job, then we need to look at is there another time that's safe, and, like we said, there might be certain areas that we do go back to dredging during times we historically did that. It's not that it's a set window, but it's that we're trying to analyze all of those things and find the right way to handle that for all species and habitat in the area.

MS. DEATON: We appreciate that. Go ahead, Paul.

MR. MEDDERS: Have you spoken or met with the NGO One Hundred Miles when you all were here? I know they're big on questioning some of this stuff, and is that a group that you all have reached out to?

MS. BONINE: I believe that our public affairs person reached out to them, and others, and I don't think we've got anything set up yet.

MR. MEDDERS: Not to pick on NGOs, because I could have a whole conversation on NGOs and some of the work, and they do a necessary work, and they're also the bane of our existence sometimes too, and so I get that, but they're being very vocal right now, and I think they're the ones that are really pushing the Southern Environmental Law Center too, and so I think that -- If I could make a suggestion, I think it would be valuable to speak to them.

MS. BONINE: Yes, sir. I definitely know they are being very vocal, and I appreciate that.

MR. MEDDERS: Thank you very much.

MS. BONINE: I don't know what your schedule is, but I know that I have other things that I have to do at some point at here too, and so they're all --

MS. DEATON: I was going to suggest that we take Cindy's question, just briefly, and Wilson, but no more, and I think one thing you definitely hear is that, at least from this group, and our perspective, is EFH habitat and the fisheries species, as well as protected species, but the concern is that the same process is being used, and I don't know -- It seems like there's definitely a need for more public outreach and outreach with the agencies to discuss it and evaluate it, before it's actually put in place, but I'm going to turn this over to Cindy, real quickly. Thank you, Nicole.

MS. COOKSEY: I was kind of working towards wrapping it up as well, because I really appreciate the fact that Nicole was able to come in and share her expertise on SARBO at extremely short notice, and so this was very generous of both her and Doug to come in and talk to us this morning, and I sincerely hope that we are able to schedule something in the fall, because it seems like there's a lot of interest and a lot of questions, and we're going to be continuing on this morning with large-scale coastal engineering and beach renourishment discussions and our policies.

I think this was really helpful in understanding what SARBO was designed to do for our ESA species, and you could really hear your passion for protecting our ESA species, but we need to have a discussion, as the AP for the council, how we ensure that SARBO, which was designed for ESA species, does not drive -- Kind of become the gorilla in the room when it comes to our discussions about EFH and how we can instead work towards having a mutual discussion that is beneficial for all of the aspects of our coastal communities, and thank you again, Nicole.

MS. BONINE: I really appreciate that, and I appreciate the hard work that you guys are doing as well. I mean, just like all of this discussion, those balances are very difficult.

MS. DEATON: Wilson, do you have a short question or comment?

DR. LANEY: Yes, ma'am, I do. Nicole, again, if I'm interpreting what you said correctly, both you and Doug have indicated that the risk-based assessment approach is something that happens

on a daily basis, and my concern here is that, while it may in fact be a very excellent process, and I think certainly that remains to be seen, it's taking place, from what the two of you said, out of the public view, even though it has been stated as the method of choice now that will be used by the Corps, and I guess BOEM as well, in assessing the impacts of these projects and trying to reduce them, rather than just avoiding the impact.

I haven't yet seen, in any NEPA document, a risk-based assessment for a particular project, and so that is of concern to me, and I guess my question is at what point in time will the stakeholders see the details of a risk-based assessment? I think it was Doug who alluded to the fact that, at the end of a year, there will be some sort of an analysis and some sort of a report, which is sort of being done after the fact, and I guess it would be useful, for those of us in the stakeholder community, to see such an analysis.

As you noted, this is the first year of the full implementation of the SARBO, and so I guess we won't see that until the end of this calendar year, but, in the interim, I guess it's frustrating to me that we can't see, in writing, what you all have said about these individual projects and how you're applying the risk-based approach and what you think the risk actually is, other than this table of three-year incidental takes that you've put out there, and so, with that, I'll shut up, and I don't really expect an answer, unless you want to tell us that there is some place we can go on the Corps' website and see a written description of how you did this risk-based assessment for an individual project. Thank you.

MS. BONINE: Unfortunately, no, there's not a place that I can send you to, and I think we've answered that question multiple times, but it is an iterative daily process, and we would be happy to meet with this group and others at the end of the year and discuss how everything happened, worked, lessons learned, and we just really appreciate working with you and others on trying to do a better job of managing dredging material placement and the environment.

MS. DEATON: Well, we definitely -- I just want to reiterate that we appreciate you coming, Nicole and Doug, and, like Cindy said, it was short notice, but I think this has been very helpful in understanding what SARBO is, what the hope is for it, and how it does, or does not, relate to EFH evaluation. With that, thank you, and I think we'll move on to the beach nourishment policy.

MS. BONINE: Okay. Thank you. Doug, did you have any closing comments?

MR. PIATKOWSKI: No, and I appreciate the discussion and look forward to more of it.

MS. BONINE: Okay. I, unfortunately, have to drop off, but good luck in your meeting today. I know there's lots of important decisions that you guys need to make, and we'll talk again in the fall.

MS. DEATON: All right. Thank you. Yes, we would love to have you come back. The reason we went through that to begin with is to get the background on how that might also be affecting beach nourishment projects, and so it just provides background on that.

At the October meeting, we had a NMFS staff, Lisa, come and speak to us about the time-of-year restrictions document that they put together, and they compiled data from as many sources as they could, and I know they pulled a lot of the biological data that North Carolina's Division of Marine

Fisheries had and plotted it with GIS, to look at time of year and location of different fishery species and the life stage, whether they were juveniles or whether they were spawning or sub-adults.

That information was a big effort and is out there, and, in the process, they also looked at what states use time-of-year restrictions, and, because of some projects that have been going on, we have also looked into that, and I know that North Carolina -- The different agencies have time-of-year restrictions that they will try -- That they will request, and, for our own use and simplification, those are in a table, various tables. Other states do have time-of-year restrictions, but it's done more on a case-by-case basis, but it sounded like all states are using that, and I think, as we just heard, there is interest in moving away from that, at least solely away from that, because it makes it really complicated to get everything dredged that needs to be dredged.

At the same time, at the last meeting, we also had a presentation on the sand study that BOEM did, and, from that, we learned that they have identified sand shoals in the entire Southeast, and they did assessments looking at their distributions and the species that are using them. They also noted many of these are essential fish habitat, and so, again, I think it's getting to the demand is increasing, and so we've got to say, okay, can we refine that and, instead of saying it's essential fish habitat, and so hands-off, then figure out is there an amount we could take, or is there an interval that would allow recovery, or is there some sand shoals that aren't used as heavily by certain fishery species as others, the more finer-level assessments.

They have this -- They have a tool called ShoalMATE, where they analyze the EFH for dredging and species distributions, and so they're looking into that, and it's going to be public pretty soon. It just points to the fact that there is definitely more interest in pursuing the sand shoals, because the navigational channels aren't really sufficient, and a lot of places, just right off the beaches, there just isn't enough sand for extensive borrow areas. Then I was going to ask Cindy if she could give us a little recap on what they found in the Folly Beach renourishment study.

MS. COOKSEY: Thanks, Anne. To kind of build upon what Anne was providing some highlights on, we've got some interesting work that's been coming out looking at time-of-year restrictions that provided us a nice summary for the South Atlantic area, specifically looking at some of our most sensitive life stages, our eggs, our larvae, and our early juveniles, for our managed species and looking at where we have the most use of our rivers, inlets, and estuaries, as well as our near-ocean habitats, where we tend to see kind of the maximum vulnerability occurring in our warmer spring and early summer months, March, April, May, June, and July.

Then we've also had interesting work looking at offshore sand habitats, by the BOEM study, and I really want to highlight that those are federal waters, offshore areas, that were the emphasis of that work, and it was really not focused on where the majority of our current impacts are occurring, which is on our coastal beaches and our inlets, the sites of our dredging activities, as well as our borrow area activities and our placement activities.

As Anne mentioned, a lot of our coastal communities have run out of sand and/or they are running out of sand, plus there is ever-expanding expenses associated with the beach nourishment activities, because they are happening at an ever-increasing scale, and so there was a lot of research that went on in the Southeast in the 1990s, and especially the early 2000s, that really helped us figure out avoidance minimization strategies for our beach nourishment activities that were

included in the 2015 policy that the council put out, and those included activities occurring during periods of low biological activity.

We knew that recovery would take two or more years, and so, if certain other minimization strategies were followed, and so to ensure that activities were spaced out, to allow full recovery between activities, looking at the importance of matching grain size from a borrow area to the placement area. Looking at how we did our dredging in our borrow areas to minimize impacts and how far down we dredged in our borrow areas, to allow for greater recovery, and where those borrow areas came from, to allow for greater recovery, but, with the increasing demand and increasing expenses, there has been this push to move outside of those bounds that were collectively established in the 1990s.

There has been a push from the Corps, and now from other private entities, to engage in beach nourishment during the summer months, and so, as a consequence of that, NMFS asked the Corps to conduct a study looking at the impacts of those summertime events on the Folly Beach renourishment project, and so that's what Andrew presented in the spring, and, I mean, as we all know, lots of things happen when you're doing research activities, and especially when you're trying to work around dredging work and beach nourishment work, and so there were some issues that occurred with the study, but they still ended up coming out with some great results.

Now, the Corps, when they worked with DNR on this study, decided to put an emphasis looking at intertidal impacts, and we were able to have them include some assessments of the sub-tidal, because that was my primary area of concern, the intertidal portion of the beach. There have been other studies that were conducted, again, in the 1990s and the 2000s that looked at the higher intertidal beach areas and found those recovered fairly quickly, and the Folly Beach study -- The most recent Folly Beach study found that to be the case as well. Our intertidal portions of the beach actually have fairly quick recovery, but this is important to note, that it still takes a number of months.

When you have the summer, especially the late spring, activities that occur, you're not going to have full recovery of that habitat until after the high period of use by our eggs, larval, and juvenile stages of our managed fishes and their prey species have moved out, and the other kind of big take-home message from the Folly Beach study was that biomass at the deep sub-tidal sites was significantly lower following nourishment activities, and it did not recover during the course of the study, which was one year long.

In addition, there were significant impacts to the nekton sampling related to the beach nourishment, in that species richness was significantly impacted post-nourishment, in, obviously, the sub-tidal areas that they sampled with their seine nets for nekton, and so the good news is that the intertidal areas recovered quickly, even during the summer months, although that full recovery did not happen until the fall period, but that we are seeing significant impacts that are lasting at least a year to benthic infauna, as well as to nekton species richness, and so those were the updates on those projects, or kind of the highlights from those projects.

As we now move into a discussion on where do we go from here, looking at our policies, we have the existing policy for beach dredging and fill, beach nourishment, and large-scale coastal engineering. We've got these pressures coming in right now, as we saw from SARBO, where we've got a document that was designed for ESA species that is potentially trying to be the driver

for other discussions related to EFH and federally-managed species and habitats, and so how do we want to deal with that as we redo this, and how can we better focus-in our policy statement to deal with these evolving concerns related to frequency of beach nourishment activities and frequency of dredging activities, as well as an economic driver to push those activities in the periods that we know are harmful for our managed species.

MS. DEATON: Thank you, Cindy. That was a really good summary of why we're looking at this policy again, not only because of increased demand and new information and concern about that demand and how you stick to best management practices, once you have those, but what do we need to do to make the document more robust and hold up with climate change considerations as well, and so what we had talked about, at the last meeting, was forming a small group that would work on updating the document offline from the meeting and then bringing it back to the full advisory panel. I don't know, Roger, if you want to go through what we have here now, or if you just want to see if we could get some input on who would like to be involved in modifying this policy.

MR. PUGLIESE: I guess we could just walk through the structure and then have the discussion on creation of a group, because I think it's important to understand that there is somewhat of a format that we've used in the past and that there may be opportunity to refine and expand. This may actually get tailored closer to say some of the newer policy structures, and so just to walk through the overall -- I can scroll through, and we can just walk through the overall structure and then get into the discussion on creation of the group to address integration of the different information, from technical presentations and other information, to address climate, also. I can just walk through the core, and I will scroll through, and you can just highlight the components as we move through here.

MS. DEATON: Okay. It starts with the policy context, which is pretty short, and then it goes into what the risk is, the essential fish habitat risk, from beach dredge and fill, and so this includes not only the placement on the beach, but the dredging activity.

MR. PUGLIESE: I will insert a couple of things, as we're walking through. Updates to connections to the existing FEP II and completion of that and the dashboard, et cetera, I think are going to be some critical things, as well as other updated information that supports this.

MS. DEATON: Good point, and so the findings are about there is impact -- There is so much, and, I mean, I can go through it all, but --

MR. PUGLIESE: I mean, the main thing was just to understand the structure, right now, of how this is laid out, where you have the EFH at risk from the activities, and so it walks through and makes sure that it captures all the different areas, and I think the potential for adding in some of the specifics that are highlighted in the newer information, and so that's where this could be refined and expanded and addressed, and so that's one of the first steps.

Then it makes the connections within there also that's -- Specific in the case of the last section, all the managed areas and some of that, and that has been updated since this, and so we need to make sure that we're covering all the newest regulatory conservation that is also happening that could be potentially impacted by these activities.

Also, just refining any of the EFH designation information, which probably links back to the EFH user guide that was just recently updated in November, to make sure that everything tracks and is connected and accessible, so that you can walk from this to the user guide, to be able to see any of the clarifications that may need to be done, but it also makes the connections back into designations that are affected by state designations, and so there's some real key things. Again, this is for consistency, for update, and for connection to those activities.

That brings us to the next section, which would be then specifically the threats, updating any additional information on threats relative to the activities, and highlighting what those are. This one is the one that really does provide the support of the information and research that highlights what those threats are.

Then it evolves to a section on the policies that are the recommendations by the council, and this is developed so that it can be considered and approved by the council, and so the recommendations establish the general policies, and, again, it talks about consistency with existing activities, and this needs to be updated, to make sure it highlights the connection to the most recent information on the Fishery Ecosystem Plan and EFH user guide, too.

This gets into more of some of the technical recommendations that I think are really going to be where some of the key areas are updated to address information on dredge windows, on sand sourcing, and other things, the most recent information and how that gets presented here, and then specifically what the recommendations are. Then it finalizes all the literature citations with integrated links to any of the documents that the council works on.

This was one of the earlier revisions, as we were going through the FEP process, and we did provide -- NOAA Fisheries Habitat Conservation provided a lot of input, in terms of consolidation and refinement and focus, to get it down further, and I think that's going to evolve even further, because I think there's been some additional adjustments in the newest iteration, and so that -- I think one of the biggest things is the opportunity to refine this so that it's accessible and usable during the EFH consultation process and that it can be used directly by NOAA Fisheries. It integrates policies that are being identified under EFH consultation letters, so that this is something that can be drawn on.

It goes back to the whole intent, some of the intent, of building these policies. The council is not able to comment on a daily basis, but the fixed and approved recommendations are available, especially with sometimes we're giving short timeframes and windows that some of these activities are going, and the ongoing day-to-day activities, as well as opportunity for this being used by state and other partners. That's the structure of what we have, and I will pass it back to Anne on where you go with how to address the directive from the council to look at climate, as well as the opportunity to integrate and expand the new technical information on areas covered in the last two meetings.

MS. DEATON: Great. Thank you, Roger. That was very helpful. I think, from here, we just need to -- We have some people with their hands raised, but maybe that's to volunteer, but I guess we need to have a sub-committee and a timeline, a deadline, for a product to come back to the AP. I am going to say maybe at least four people, and one per state would be helpful, and up to eight, I would say, at the most. Wilson, were you volunteering?

DR. LANEY: Yes, ma'am, I was, but I also had a recommendation. The recommendation is that the AP members consider reading a publication by Cornelia Dean, which is called *Against the Tide: The Battle to Save North America's Beaches,* or something along that line, is the sub-title. I just finished re-reading it, and it's a 1999 book, and I was struck by how relevant it still remains today.

As you would expect, Ms. Dean, who was the science editor, I believe, for *The New York Times*, spends a lot of time quoting Orrin Pilkey, but she also references a lot of other big names that all of us recognize from the whole coastal engineering arena, like Dr. Bob Dolan and Dr. Dean from the University of Miami, to whom she is not related, and so forth and so on. I just make that recommendation. If you can find a copy of that book in your local library, or in your agency library, I think it's well worth reading as background information for undertaking the revision of this policy, and I, again, certainly would be willing to volunteer for the workgroup, Madam Chair.

MS. DEATON: Great. Thank you. That's a good suggestion. Paula, would you like to volunteer?

MS. KEENER: Yes. Thank you. I would, and I also have a question. I compared the habitats that are listed in this document to I think it was the North Carolina -- Anyway, I will address that in the committee work or whatever, but I want to go back to, just for clarification and discussion in this panel, the letter that was -- This is the March 27, 2020 letter that was preceded and was submitted with the biological opinion that was discussed in the previous presentation.

On page 2, and I will say that I have written biological opinions before, and they are not easy. They are very complicated documents with a lot of information, and they take a lot of time, as you would imagine, and I'm sure many of you have been involved in that process as well, but, on page 2 of the letter, it says the requirements of this opinion are separate and distinct from any requirement under other applicable laws, including the Marine Mammal Protection Act, the Magnuson-Stevens Fishery Conservation Act, and other federal, local, or state requirements.

It goes on to say that the routes of effect that NMFS evaluated under SARBO to determine if the actions proposed by the Corps and BOEM are likely to jeopardize the continued existence of a listed species and/or result in the destruction or adverse modification of critical habitat differ considerably from the routes of effect that NMFS evaluates during an EFH consultation to identify measures to avoid, minimize, or compensation for adverse impacts to EFH. Therefore, the PDCs in the 2020 SARBO should be viewed as neither substitutes for EFH conservation recommendations nor as necessarily sufficient steps for avoiding, minimizing, or compensating for adverse impacts to EFH under the MSA.

My question is how does that affect -- That is going to play into decisions and how we address updating this March document that we're discussing now, this March 2015 document, and how that does paragraph affect what decisions should go forward and considerations for updating this document?

MS. DEATON: Well, I will start with just saying that it means exactly that, that it's separate, and the concern is what we heard today and what we have observed in action, at least in North Carolina, and maybe Georgia, that they are -- It appears they're extending that to all species, but Nicole clarified today that it's the process that is the same and not the SARBO, and so I don't think we -- I don't think it hinders modification of the policy, and maybe Cindy might want to add to that.

MS. COOKSEY: Thank you, Anne. I did, because I think Paula is correct, in that we need to ensure that the updated policy in some way addresses SARBO and highlighting the fact that the AP and the council do not support the use of SARBO beyond its intended purpose, specifically for ESA-listed species, and we need to be, I think, continually trying to drive home the message that SARBO was never intended to address fisheries habitat or fisheries resources, and it is improper to try to have it address those issues, as we've made perfectly clear in the cover letter for SARBO, and that was something that NMFS was adamant be included in the opinion, to try to avoid having problems arise, and so I do think we should try to address it in some way.

I am volunteering to be part of the committee, and, as we move forward with developing it, I reiterate Anne's statement that it would be, I think, super important to have a representative from each of our member states as part of that team, and if you, as the state representative on the AP, are not the best person, then you can certainly recommend someone from your state that would be the best person that we can bring in as an outside expert to help the development of the policy.

I also want to bring up, for discussion, the possibility of having -- When we finish the development of it, ensure that the document, especially if it becomes a longer document, which it is likely to do, that we end up ensuring that there is an executive summary as part of the policy that can be a one to two-page cover statement that allows us to really highlight the most important take-home messages.

I think, regardless of how we feel about beach nourishment, it is something that's going to continue to happen throughout our region, and so we really need to focus on how we can ensure that it moves forward in a way that it minimizes the impacts as much as possible, including continuing forward with a lot of the recommendations that also exist, but driving home the messages related to environmental windows.

Then something that I forgot to add earlier was -- This is related to communities struggling to acquire sand sources, as the nourishments are happening more frequently, and covering larger areas, and there is a movement afoot to harvest sand from the shoal-inlet complexes, and they are cheap and easy to access, and they are generally beach-compatible material, and so that is an area that we should likely try to highlight as something deserving the highest level of protection, because, as communities struggle for those sand sources, anything that's nearby and easy to access will become targeted by them. Thanks.

MS. DEATON: Thanks, Cindy, and they're not just trying. They're doing it. They're doing it in North Carolina, in the Cape Fear River, and they've been using a shoal there, and now multiple towns want to use the shoal, and they want to go back before they're supposed to go back, and BOEM is working on, actively working on, Frying Pan Shoals and getting some research on it, to determine if some of those beach communities could use the cape shoals, Frying Pan Shoals, as a cape shoal, and so I agree with that. I will also volunteer to be on this sub-committee, and so we've got Cindy, and we'll call South Carolina, and we have North Carolina. Paula, I'm not sure where you're from.

MS. KEENER: South Carolina.

MS. DEATON: Great. What about Georgia or Florida? Rene, is that something that you could do or you could --

DR. BAUMSTARK: I was going to volunteer to at least coordinate between myself and someone at the agency who is well equipped for biological opinions like this that is not necessarily me, unless there's someone on the call.

MS. DEATON: Awesome. That's what you can do, is just coordinate with a co-worker.

DR. BAUMSTARK: Yes, and it will be someone from coastal zone management that does the commenting for us.

MS. DEATON: Okay. I see a couple more hands. Shane, did you want to say something?

MR. STAPLES: I was just piggybacking on what you were talking about with the shoals, because it's been a while since they brought it up, but Buxton is dying to get their hands on Diamond Shoals as well, and so that was really all. If you all are trying to get -- As far as being on this for North Carolina, trying to do anything in the next few months for me would be tough, and I don't know, but, between COVID and stimulus checks or whatever, but, in the permit world, it's been insane right now, and so, like I said, my phone is blowing up while I'm on this conference call, and I've had to hit "do not answer" I don't know how many times.

MS. DEATON: Okay. Let's see what we get here.

MR. PUGLIESE: Shane, let me just jump in. We can work on timing, because I think the outside line on this is you will not meet as a full advisory panel back until October, and so there's some -- To make sure that engagement, and, as the agency, I think it's going to be important that the agency reps from each, which are essentially also the sub-panel chairs, are at least involved or, as even Rene indicated, make sure that they bring the appropriate people in, and so engagement is probably good, and I think Paul also had his hand up, and I'm sure he'll clarify.

MS. DEATON: Paul, were you volunteering?

MR. MEDDERS: Yes, I will volunteer for our state, and, there again, I may not have all the expertise, but I will make sure that I get the people that do to comment, and I just wanted to -- My other comment was kind of based on our dredging conversation before, and this is not really about either one of them, except for, in Georgia, we're doing some beach renourishment, and I have some concerns about that, but I also have some concerns about --

We've tried putting some dredge materials into a hold that's in one of the sound systems, and so what I'm really thinking about, from an essential fish habitat perspective -- That one really concerns me, because it feels like one of Donald Rumsfeld's unknown unknowns. We don't know anything about these holds, but we think they're important for some things, and we're trying to put dredge materials in them. If we're thinking about some of these dredging issues, that's sort of a lesser-known one for us, and the thin-layer placement. We've attempted thin-layer placement also, and both of those, when it comes to essential fish habitat, has me really concerned, and so that's all I wanted to say.

MS. DEATON: All right. Cindy, I see your hand.

MS. COOKSEY: I just forgot to put it down.

MS. DEATON: Okay. Then John Ellis.

MR. ELLIS: Anne, you already said you would be on North Carolina, as a rep on it, but, if you need some help or whatever, give me a shout, and between me and Cathy, who works on those things mostly in our office.

MR. STAPLES: Anne, I know I don't have my hand up again to talk, but, like I said, if I can be in the loop on it, I will provide what I can, because I do know -- Like I said, the dredge windows, from a permit standpoint, is heavily impactful to how we issue the permits, and it's more impactful to my personal opinions to fisheries and how it impacts them, but, as far as the committee part is concerned, I can be involved there, to an extent.

MS. DEATON: All right. Great. I can envision that we'll have the sub-group come up with a draft and then circulate it with the Habitat and Ecosystem AP, and then our goal would be to have it done in time to review at the October meeting. Is that right, Roger?

MR. PUGLIESE: Yes, that would be the plan, and, given the capabilities with the webinars, et cetera, we may be able to have something in between with just the four members to advance this, or multiples, or even an open one to review and advance, if needed.

MS. DEATON: Okay. Well, I think then why don't we move on, and I know we're running behind, and I was going to suggest that we take a small break before we move into the FEP Implementation Plan Discussion, and would that be all right?

MR. PUGLIESE: Yes.

MS. DEATON: Unless you wanted to bump that down, to allow the habitat blueprint to get in before lunch, for sure.

MR. PUGLIESE: We could do that, and we kind of walked through that to begin with. Myra.

MS. BROUWER: I'm ready.

MR. PUGLIESE: Why don't we go ahead and do that, because I think we can -- That will be a good stepping-off point, and we should be able to walk through that, and so let me get there.

MS. DEATON: Before I forget, is there anybody on the line that would like to provide public comment right now?

MR. PUGLIESE: I am not seeing any hands right now.

MS. DEATON: No hands raised. If you change your mind, we will do that again at the end of the day. With that, how about a five-minute break, since we're running behind, or do you want ten? I think five is fine. We'll be back at 11:15. Thanks.

(Whereupon, a recess was taken.)

MS. DEATON: I think this is going to be Myra giving this update, and is that what I hear?

MR. PUGLIESE: Yes.

MS. DEATON: All right, and it's an update on the development of the South Atlantic Fishery Management Council's habitat blueprint, and Steve talked to us a bit about that yesterday, and so we'll hear a little bit more now. Thank you, Myra. Go ahead.

MS. BROUWER: Thank you, Anne, and hello, everybody. My name is Myra Brouwer, for those of you that I have not yet had the pleasure to meet. I've been sort of not focusing on habitat too much, although I do remember many of you from the early days, when I was doing habitat and coral work, and then I went off to snapper grouper for a while, and now I'm back as Deputy Director for Management, and so I'm happy to be back to give you this update.

First off, back in December of last year, the Habitat and Ecosystem Committee discussed developing this blueprint, and, as Anne mentioned, Steve Poland talked to you about this a little bit yesterday, and the purpose of the blueprint is to describe and to evaluate how the council is meeting its mandates related to habitat and ecosystem in the region, and I will come back around to the ecosystem part of it here in a minute. The council directed us to put together a development team to work on this blueprint and develop the scope of the project during 2021.

The blueprint is going to be, as I said, sort of a strategy, kind of like describing how the council goes about doing the things that the council needs to do to meet those mandates under the MSA and other requirements, and so the workgroup is assisting in preparing and reviewing materials for the council and the Habitat Committee to review during their regular quarterly meetings and facilitate those discussions and, of course, use efficient time of the committee time during the meeting, so that all decisions are made in an open forum at the committee level and through official meetings that are noticed in the Federal Register.

The membership of this workgroup consists of several council members, all of whom are listening in right now, and so Steve Poland, who you all heard from, he is the Habitat and Ecosystem Committee Chair and the South Atlantic Council Vice Chair, and he is our workgroup lead. We also have Mel Bell, our Council Chair, from South Carolina. Carolina Belcher is the Habitat and Ecosystem Committee Vice Chair from Georgia, and Kerry Marhefka is the Snapper Grouper Committee Vice Chair, and she is also from South Carolina. Then there's us, the council staff, and there's John Carmichael there on the left, our Executive Director, myself, and Roger.

We are convening in between council meetings during this year, and so we've already had two meetings this year, and we've been working on identifying supporting documents and what we need to put together for the workgroup to start shaping this blueprint and develop the actions that the Habitat Committee and council need to take with whatever input we need from the AP, or maybe even the SSC at some point, and review progress and prioritize the issues that we need to be discussing and whatever information requests the committee and council have for us.

The questions we had for the committee in March, and this something that the AP, you guys, talked about a good bit yesterday, but we asked the committee, do we need to include ecosystem and climate-related mandates in this blueprint, and that's where the committee directed us to focus our efforts in putting this blueprint together, just on the habitat program, and so it's not that the council is going to de-couple those two things, ecosystem and habitat.

I think they're very well aware that all these things are connected, and importantly so, but it's just that, for purposes of this blueprint and this strategy and this evaluation of the council's activities and the various tools and things that the council has, we need to kind of have a more focused approach, because it could get rather unwieldy. That is why they said let's just focus in on what we're doing, in terms of habitat, and then we also still need to sort out exactly the role of the Habitat AP and other advisory panels in the development of the blueprint.

Right now, I will be happy to take any questions, and we are going to bring back to the Habitat Committee our progress so far at the June meeting, and, as part of that, we've been looking a little bit more and having more discussions about the EFH consultation process and what entails the five-year reviews that we have to do every so often, and how those are done, and then shining more light on how all these activities impact what the council does and engaging and identifying how the various partners and agencies, who you all represent, are engaged in the process and kind of just defining those roles a little bit more. I would be happy to take any questions right now. Thank you.

MR. PUGLIESE: No hands.

MS. DEATON: Thank you, Myra. That's helpful.

MR. PUGLIESE: Sorry. Wilson came in at the twelfth hour.

DR. LANEY: Sorry. I slipped in under the wire there, Myra. I listened to the March Habitat Committee meeting, and, obviously, I just heard your presentation, and could you clarify for us, with respect to the blueprint and climate change and ecosystem-based management, including the Ecopath model -- Clearly those latter two things are -- Well, all three things, the habitat program and climate change and ecosystem-based management, they, obviously, overlay, or overarch, all of the council's FMPs, and habitat, in particular, is the foundation for fish and fisheries management. If it weren't for the habitat, none of the rest of it would exist. Maybe I should say, if it weren't for quality habitat, none of the rest of it would exist.

What do you envision being incorporated in the blueprint for ensuring that both climate change considerations and ecosystem-based management considerations are networked with the blueprint, for lack of a better word, and maybe a recommendation to the council and staff workgroup would be that some specifics be included in the blueprint as to how the council envisions that that integration will occur, and so that's my question, is whether or not you think that will be part of the blueprint. Thanks.

MS. BROUWER: Thanks for that, Wilson, and I don't want to speak for the council, but my understanding is that the council is very much aware, as I said, of how important all these connections are, and their intent is not to minimize or ignore or not pay attention to these things and their interactions in all of their activities and what they do. However, it's just a way to focus

our efforts in evaluating what's been done so far and kind of take -- What's the word that I'm looking for? Take stock of what's been done in relation to the mandates that the council has to address EFH and also keeping in mind, of course, there's a lot of directives that are coming from different directions, especially as they relate to climate.

The council has been involved, in the last couple of years, in an initiative that is a coastwide initiative, and Roger actually sits on that workgroup, to develop a scenario planning approach for how the councils are going to address climate-related issues as they pop up, and so I think they envision this being sort of a starting point, and so I don't want to say that they're not going to eventually -- That the blueprint is going to be a static thing, and so I think it's going to continue to grow, and perhaps, at some point, incorporate ecosystem-level and climate-change-level activities as well, but I think, for now, as we're starting off, we're going to take stock, as I said, of the habitat program and then go from there. I see that Roger has put up the presentation, the one I had intended to give.

MR. PUGLIESE: This is the PDF. Sorry about that. The PowerPoint was the other one, and this was the -- They're named the same. Sorry. This was the PDF that was in the briefing materials that everybody had, and so I just wanted to make sure that the next steps was clear.

MS. BROUWER: Right, and so you can see here that the next steps -- We are going to bring to the Habitat Committee, in June, some draft goals and objectives for what we intend to accomplish in the blueprint, what the habitat program accomplishes, and clarify, as I said, the review process and what the council and NMFS' roles are in that process, and you've been talking about the need to update and revise some of the policies that have been put in place, and so that is going to also be part of this exercise, and maybe even come up with a prioritization approach for how those policies get reviewed over time and how that gets done.

Eventually, we also intend to evaluate how the various tools and services that have been developed over the years, how those things are meeting the habitat program's goals and objectives, and so, here, we're talking about, which we'll get to later in this meeting, web services and a dashboard and all these various things that have been put together over the years, kind of getting a little bit more information for how those tools are in fact meeting the needs of the council's habitat program and the partners in the region. Have I answered your question, Wilson?

DR. LANEY: Yes, I think so, more or less. I mean, we'll -- I'm sure the AP is going to be very interested to see how this evolves, and, again, how climate change and EBM can be assured of being fully integrated with the habitat program, and I think that's my interest in asking the question. Thank you.

MS. DEATON: Just to add that I guess it makes sense that, since EFH is in the Magnuson-Stevens mandates, that you focus on those essential fish habitats first, before you expand to the more complex ecosystem level. Thank you, Myra. We have a couple of questions. David Webb, did you want to ask a question?

MR. WEBB: Thank you. At the risk of falling into the trap of making an assumption, this is the second presentation that we've seen where significant -- The issue has been raised of separating somehow ecosystem management and habitat and climate. While my personal opinion is that the authority that the council may or may not have over any or all of those is probably significantly

different, and certainly, listening to the comments that have been made yesterday and today -- I don't want to characterize it as a turf war, but, obviously, there is some significant apprehension within members of this particular AP of why they want to go in that direction and how that might actually play out.

What I would like to have is maybe Cindy or somebody else, and maybe this is not the proper time in the agenda, but if we can get a little more insight into the conversations that are obviously taking place and why this is even being considered, and maybe we could collectively come up with certain ways to approach it where the concerns that have been raised won't get lost, and yet we don't inhibit the council from being as effective as they can be by having too much responsibility on the AP, and so I would just make a request that, at some point, whenever the appropriate time is, that we get some clarity from the council as to the thought process about the potential of these operations, so we could more effectively address it. Thank you.

MS. BROUWER: Thank you, David, and I guess I will refrain from commenting there. There are some council members in the audience, and I'm not sure if any of them would like to, at this point -- I see that Mel Bell has raised his hand.

MR. BELL: Thanks. This whole process started basically to make sure -- We've done an awful lot related to habitat, and Myra described some of the products and things that we have in place and things that we've developed over the years, and so this started as let's assess what are our statutory requirements for Magnuson, what are our regulatory requirements and processes, and are we basically doing the things that we know we need to do, related to habitat, how all the hard work that everybody has done so far -- How does that play into addressing our responsibilities, and are we good there, and then where are we taking this?

It was never -- When we started this, it was not really about an intent to separate out climate change or ecosystem-based management or anything, and it was about focusing on let's assess what our responsibilities are, our legal requirements, are we meeting those, and, if so, great. If not, what do we need to do differently, if anything, and certainly Wilson's point about these other areas, which, as you know through the discussion, are very complex, and you can spend entire days talking about just those, and it was not the desire to cut those out, but it was just let's focus on the core responsibilities we have towards habitat from Magnuson and make sure we're doing that and where are we going and what's the plan.

Then, at some point, obviously, you have to have some connectivity between what you're doing related to habitat and these other issues, like climate change and how ecosystem-based management works, but those two areas themselves are fairly complex in themselves, and so this was really trying to simplify things, so the council kind of knew where we were going with this, what we had accomplished already, how are we doing related to meeting our requirements, and moving forward.

This kind of tying into seeming to cut out climate change, or cut out ecosystem-based management, no, that wasn't the intent. It was really focused on what are our responsibilities towards habitat, are we meeting those, and how can we move forward in the future and make sure we've got things covered, and realizing the future is getting more and more complex now with some of these other factors we're dealing with, and so that's why -- That's how this whole thing got started, is an

assessment of are we doing the things we need to do and investing the funds and the time and the effort in the areas we need to related to our responsibilities for habitat, per Magnuson.

Then it just kind of helps us move into the future, and so that's why the blueprint concept was kind of having a plan to carry us into the future, but certainly these other things that are going on on top of all of this, as you all have discussed already, come into play, and there has to be some connectivity there, obviously, because the habitat itself is not isolated from all of that, and so I hope that helps a little bit, and Steve Poland may want to weigh-in a little bit, if he would like, but that's kind of my perspective.

MR. WEBB: Thank you.

MS. DEATON: Steve, you can go ahead.

MR. POLAND: I just wanted to follow-up behind Mel. I mean, Mel covered it well. This isn't -- There is no intent here to split anything out or shed responsibilities or anything like that, and it's just a programmatic review of the program, and many of you listen to our council meetings and are aware that there's just not a lot of engagement from council members on habitat-related issues and discussions, and one of the other motives of this, I guess, is to make sure that, like Mel said, we're incorporating the habitat information, when appropriate and where required by the law, but also ensuring that we're providing the type of discussion and making the type of decisions that we need related to habitat and making it aware to the council that these issues of habitat, related to all of our broader issues of fisheries management.

By putting together a blueprint, it hopefully highlights that these are overarching issues, and there's a lot of interplay between the habitat-related issues and climate and governance of fisheries and that kind of stuff, and just making sure that the council is aware and that we have a plan on how to continue and advance those perspectives and discussions and that we're not, as a council, falling short on any of those goals or mandates of the program.

MS. DEATON: Thank you, Steve. I think that sounds like something that should always be done, periodically, in programs. Wilson has his hand up. Go ahead, Wilson.

DR. LANEY: Thank you, Anne, and thanks to Mel and Steve and Myra for elaborating on that. That makes sense to me, that the initial focus should be on the habitat program and on the obligations that the council has under Magnuson, and I would suggest too that -- I can't remember whether we've discussed this before, or whether the council committee has discussed this before or not, but certainly there should be a discussion of how the council staff and the AP relate to all the other stakeholders that have a vested interest in the habitat quality and its role as a basis for all of the fish that both the council and the interstate fisheries commissions and the individual state jurisdictions manage.

I think it's a trite expression, but clearly it takes a village. You can't just manage habitat by yourself. The council nor the states have full authority to be able to do that, and, while it is, in some respects, easier in the ocean to do that than it is in inshore areas, those two are inextricably linked as well, and so I appreciate your responses, and I would just encourage all of us, as this discussion goes forward, to think about the partnerships and the stakeholders.

I think Roger is to be commended for having done the tremendous job that he has in taking the council's habitat program as far as he has, and especially commended for the ecosystem-based aspect of it and for putting together the group that ultimately produced the Ecopath/Ecosim/Ecospace model that has been approved by the SSC, and I think it's going to give this council a huge leg up, in terms of getting management insights that other councils will not necessarily have the ability to get, because they don't have such a model, and so I will stay tuned, and I think that I certainly stand ready, as an AP member, to assist the council in any way I can, and I know the whole AP feels that way, and so thanks again, folks, and we will listen with interest to the discussion in June.

MS. DEATON: Thank you, Wilson. Chair Mel, would you like to speak?

MR. BELL: Yes, ma'am. Thank you. Just really quickly, and one other thing that I didn't mention, but it's just to show how serious we were taking the habitat piece and everything you all are involved in, is the Habitat Committee now is one of our mega-committees, if you will. Steve had mentioned engagement by the council on things when sometimes we get to habitat, but we have elevated it to basically a full council committee, and so the intent is to get council members fully engaged in things as we move forward in this area, because it is that important, and so I just wanted to point that out, and it's an important area, and we're now one of the -- Habitat is one of the mega-committees, and so that's just for your information.

MS. DEATON: That's great, because habitat is mega important, right? All right. Well, thank you very much. Is there any other discussion that anyone would like to have? If not, we could move on, unless -- It's ten to twelve, and so we could break now for lunch, or we could do FEP Implementation. Roger, do you have a feel for how long it will take to do the remainder of the agenda items today?

MR. PUGLIESE: Considering we moved the blueprint up, I think probably just doing the FEP and the other ones after lunch will round the day off. I think, given everything we dove into this morning, it might be a good break for -- Let everybody take a minute off and do that, because I think those will all kind of -- Some are a little more hands-on, in that discussion we're going to have on the FEP in the afternoon, and then the presentations and input and providing -- A lot of this will feed directly into discussions we just had on information for the blueprint, et cetera. That, I think, would be good.

MS. DEATON: Okay. So we'll break for lunch now, and do you want to start back at 1:00?

MR. PUGLIESE: I think we'll be good to get through that.

MS. DEATON: We can start at ten to 1:00.

MR. PUGLIESE: It's up to you, Madam Chair.

MS. DEATON: We'll say 1:00. All right. We'll see everybody back then. Thank you very much.

(Whereupon, a recess was taken.)

MS. DEATON: I think we should go ahead and get started. We've got, I think, almost everybody back. The first agenda item for the afternoon is to discuss the Fishery Ecosystem Plan II Implementation and Strategic Planning, and so two attachments were provided in the briefing book for that, 11 and 12, and Roger Pugliese is going to provide an overview of what has occurred, accomplishments, and then discuss potential priorities for the upcoming year or two, and so, Roger, do you want to take it away?

MR. PUGLIESE: Okay. We'll get going here. What I'm going to do is provide a quick overview, and, actually, this is going to be a little bit of a -- After this, since we are not able to do our breakout sessions, it's going to be a little bit of a live, hands-on type of thing, where what I've done is just consolidated down the actions into essentially a list pulled from a simpler document that was provided as one of the attachments.

The idea is to identify some of what would be potential priorities for 2021 and 2022, and then also some discussion on some of the areas, highlighting some of the areas that really are going to be addressed by probably other partners, or through other avenues, so that we can clarify some things that are kind of direct involvement, say, of the advisory panel or the council, et cetera, and so that's how I was going to proceed with this.

First, let me just jump into the quick overview on that, and then we can actually do the hands-on walkthrough. The Fishery Ecosystem Plan roadmap has been reviewed and discussed over a number of meetings, and the advisory panel has been providing input over time, and we're at a stage where what would be good is some realization about some needs relative to some kind of realistic things that can be accomplished in the next couple of years, the opportunity to highlight some of the areas that have been addressed, and then where we can go beyond here.

I'm just going to walk through essentially the chapters and touch on some of the key points of where we are, and then we can directly into kind of looking at actions and then having discussions and focus on maybe some of the specific areas that could be highlighted in the near future.

Under Chapter 1, with regard to South Atlantic food webs and connectivity, the focus, over time, has been compiling information on forage fisheries and the potential for the development of indicators, food web connectivity, and also looking at trophic pathways. I think, as I go into the companion walk-through of the document, some of these areas have been addressed through connections and expansion of information that has been compiled over time, relative to our developing Ecopath with Ecosim models.

Some of them, I think, are outside the bounds of what the council really can do, but may be provided as we're working with our partners on say food web indicators, through ecosystem status reports, through coordination with some of the indicators that are being developed outside of the council process that I think have been highlighted over the last day.

Understanding some of the connectivity between the different food web areas, I think some of the -- There has been progress on those, and some of the activities, again, have been highlighted through either recent research or integrated into specifically, again, the developing Ecopath with Ecosim model.

Moving forward on Chapter 2, with regard to climate variability and fisheries, there's a lot of focus on development of species distribution and the potential for shifts in expansion and a really critical point for some of that discussion, because of what's going on with the climate vulnerability assessment that's moving forward and as well as facilitating some of the direct involvement in how some of the information on climate gets directly into management discussions and that whole climate scenario planning process and information that can feed into and support and expand that.

Some of the information has been developed through some of the partners, again, on distribution shifts, some in-house, using fishery-independent surveys, and I think you will see a webinar, later on this year, on the application of that information, to provide some of that context and change, and maybe even a broader, expanded version. That may be something that hopefully will come down to using some of the more recent information from those surveys and the environmental information and coupling it with environmental information that's being compiled with partners.

Climate indicators is, again, another one of these situations with information coming from either the climate vulnerability analysis, the ecosystem status report, or some of the partners' work on indicating what change has been occurring, and so that's going to be kind of a crosswalk between things that we have access to and things that really are not in our control until we actually get access to it, the whole idea of that being integrated directly into habitat information, as well as stock assessment, and a lot of discussion over the last days about the potential for habitat assessment and climate-based habitat activities and then the issue of the possibility of integration into the assessment, and I think that actually is --

As the Ecopath and Ecosim is advancing from development to operationalizing, we're going to see some of the focus on its application, and then components of that may be able to be looked at, whether it's individual outputs from information that's being compiled or actual information from the outputs of the models. Probably the further we go into 2022, and when the Ecospace is looked at, it will enhance some of those activities.

That moves us into the marine aquaculture chapter, and one of the areas that was highlighted is suitability of potential aquaculture sites, and I think there's some opportunity, within this specific chapter, to address some of the outstanding discussions on areas and coordination and integration of information on aquaculture sites.

One thing that may be useful for the AP and the council to get into is the opportunity to piggyback some of the activities of the CCC habitat workgroup that's going to be looking at wind, but also looking at all offshore, and so there may be an opportunity to look at how they're putting together some information that may be best management practices into the future, and so there's opportunity to advance some of those, I think, into the future there. However, some of the areas are still outstanding.

The submerged aquatic vegetation chapter, again, this is an opportunity -- There's been a lot of work done that I think was highlighted in the past, in the iterations we've been looking at, at the state levels, on advancing mapping and monitoring, and this is one area that we can look at as we get into more of the action itself to look at what has been done, and maybe having those compiled, so that, in context, we understand the distribution, but also guide advancing mapping and monitoring, because all of this area is designated as essential fish habitat or essential fish habitat areas of particular concern.

Under the Chapter 5, the beach dredging and renourishment and large-scale coastal engineering, appropriately, all the discussion we're having on advancing the policy activities, and it gets to some of the issues that were highlighted in here on the comprehensive environmental preparation and some of the recommendations specific to fill material and sediment characteristics or some of the dredge characteristics and ultimately reducing impact and providing the policy to the partners in the past, and we will advance providing the policy as it gets updated and refined, so that some of these areas, and some of these specific recommendations, have the potential to go directly into the developing policy, and so I think there's some of the information that has been accomplished, but I think, with the revision, a lot of these pieces that were identified can be integrated into a revised policy.

Under energy exploration and development, providing the information and the policy to partners has occurred over a number of times, and the intent is to avoid, minimize, offset damage, of course, and avoiding allowable fishing areas and deepwater Coral HAPCs and other managed areas, and so a lot of these activities have been ongoing with the discussions and information and activities that were going on on seismic testing, on the advancements of potential oil and gas, and the council's comments on some of the longer-term planning documentation for energy.

Then, more recently, involved directly in a lot of the alternative renewable energy involvements and advancing the minimization of impacts on habitat, as those are moving forward. Those activities are supporting the longer-term EFH consultation process, as well as advancing our understanding of habitat information, the mapping that can be provided as all of these activities, especially when we're looking at some of the wind, as coming closer to shore and nearer to some of the council-managed species and habitats.

Alterations to river, estuarine, and nearshore flows policy, to avoid and minimize and offset damage, and there is project requirements that have been laid out in here, some of the recommendations on longer-term flow regimes, and, ultimately, some of the goals to maintain some of the natural flow systems.

Again, some of these recommendations or intent to have these types of actions accomplished are going to come through partners, to a great degree, and I think some of the reengagement with groups, such as SECAS, through the blueprint, actually have access to information from some of the -- That would establish, or identify, some of these very specific information systems, but, again, many of them are outside the bounds of our deliberation, but will be potentially accomplished in some of those actions.

Under Chapter 8, under the non-native invasive species, advancing -- Providing the policy in the past and also supporting the use and creation of novel gear and compliance. The council has been involved and actively engaged with NOAA Fisheries as they address issues such as lionfish and beyond. Some of the other requirements for cleaning of materials off of existing structures and some of the areas not addressed yet include things such as ballast, and those may be things that might be worthwhile picking up and, at least within the next year or so timeframe, beginning to get the larger picture of some of those areas, kind of in the background. Also, endorsement for some of the eradication and removal, and some of that has been ongoing as different species have some to the council's attention.

The artificial reef policy has advanced some recommendations on standardization on the areas and comparisons, and I think there is, again, an opportunity to -- We have started this process a number of times with the AP, but, with the council not advancing on necessarily marine aquaculture, it's been a little bit in the wings, and, again, this is an opportunity to look at everything that the councils, or the individual states, are accomplishing with their programs and be able to look at them in context to set the stage to understand how all of those are operating.

We have built an artificial reef online system that includes all of the information on distributions of all the artificial reefs in the region, as well as information on links to their existing sites on materials, on video, on imagery, and so some of those are advancing the broader view of artificial reefs, and this is also one of the ones that can highlight opportunities on research and needs, especially since the artificial reefs -- A number of them have been used in the designation for the spawning special management zones, as well as the MPAs.

The idea is that we begin to have that discussion on the list of priority actions, so it can advance to the council for discussion in June, and the AP can begin to schedule some of these deliberations and review, in coordination, as we move into and discuss issues that will be addressed at the October meeting.

Before I go into the next section, are there any general questions that anybody has regarding the FEP Roadmap at this stage? What I plan on doing -- As I said, it's going to be kind of a hands-on session, and I'm going to have a Word document with the list of actions, and just highlight some of them and how they were accomplished and then have some frank discussions on what may be some priorities, and then also what may not be, in the scope of the range of what the panel, or the council, is charged with. Seeing none, let me move on to the next step.

MS. DEATON: Roger, do you think we need to discuss, of those nine topics, which of the nine topics are a priority, and then look at those first in more detail, or just go down them 1 through 9 and do them all?

MR. PUGLIESE: I mean, you can have a general discussion of which -- There may be a reason that that's appropriate, because, as was highlighted, the council committee, and really the workgroup that's working on the blueprint, are going to be discussing the prioritization, potential prioritization, of policies and revisions into the future, and this may be a way to kind of frontend load some of that discussion for their benefit, to know where there may be things that are more immediate that need to be addressed, like the dredge policy.

That activity, I think, is going to -- Of course, whatever is supporting that may be addressed under actions that are relative to that, and then, beyond that, some of the other actions -- I was going to raise some of the things actively going on that affect climate and that affect energy, and so some of these may rise to the surface by doing that, and then we can actually get a deeper dive into the actions, what's been done, and then maybe some specifics of some of the actions that could be accomplished under there, and so, yes, that would probably be a very appropriate discussion to have first.

MS. DEATON: Okay. I don't know how we will do that. I guess I would offer up that I agree that the dredging and beach nourishment is definitely a priority, for now, and so that one I would include in the top. Wilson has his hand up.

DR. LANEY: Yes, Madam Chairman, and I certainly agree with your suggestion that dredging and beach nourishment should be a priority, and I would suggest, perhaps, that another one might be the SAV, simply because I think it would be beneficial to -- Given that the Albemarle-Pamlico National Estuary Partnership has developed a monitoring plan now, it might be useful to run that by the AP and have a discussion about what other states are doing, and I realize that other states here equates pretty much to just Florida, since Georgia and South Carolina have very limited SAV, but maybe SAV would be a second one that we could put, if we're trying to prioritize these.

Then maybe a third might be energy exploration and development, and I know we have a good bit of activity going on with respect to wind, and so maybe that would be Number 3, and I don't know. If we're just sort of trying to go through and develop a list, sort of the AP's recommended priority for the nine chapters, those would probably be the first three that come to my mind.

MS. DEATON: Okay. Go ahead, Roger.

MR. PUGLIESE: I would just jump in, as a follow-up, and Myra has some comments, and the way we can do this is I think, in reality, Wilson hit, pretty much, what I think is probably going to unfold, is some of the significant ones, because of all the other actions going on. What we can do is identify them and then go straight to the section and identify, within the individual areas, what may be outstanding that could be addressed, those specific actions.

MS. DEATON: Okay. Myra.

MS. BROUWER: Thank you, Anne. I think this is a really good exercise, and I appreciate the AP taking time to help us prioritize. I would just urge you to keep in mind the council's priority, and so it would be really useful, for the blueprint, if you all discussed -- As you went along and you prioritized, if you gave rationale for how this -- Why those priorities are being recommended as such, in terms of what the council intends to do, and I think I explained that right, and does that make sense?

MR. PUGLIESE: That's perfect, Myra, because that's really what we're trying to do, is accomplish how to address the mandates that the council has, and so building the rationale I think for these different ones, and we kind of opened the door with the first discussion that we just had, and now how we go in the broader sense of how that's going to address the EFH mandates, or needed components.

DR. LANEY: Madam Chairman, could I just follow-up? Myra, could you, or Roger, remind us what the council's priorities are? I think it might be useful to throw that up in front of us at the beginning of this discussion here.

MR. PUGLIESE: Myra, you can jump in on it, but I would say what we're trying to do is address the priorities relative to overall and the mandate for conservation of EFH and protection from non-fishing activities. The broader mandate is across-the-board, but I think what this is doing is kind of crystallizing down, in that context, what are some of the most significant activities under these different policies that may need to be addressed, with the help of the advisory panel over the next two years, or through 2022, so there is drivers --

Where Myra was going before, I think, was what are the drivers that are doing that, the implications on dredging, and we've heard a lot of the rationale of what the needs are and the potential attack on some of the habitats that are either essential fish habitat areas of particular concern or some of the activities and how we can refine that and engage the policy and then actions that are beyond the policy that are identified in here to conserve and protect essential fish habitat or the managed species that are dependent on it.

MS. DEATON: Of the three that Wilson mentioned, they all -- Well, SAV is EFH, for several South Atlantic species, and it has -- There are concerns related to climate change and how it will do. Beach nourishment, you've got EFH of the shoals and inlets. Energy exploration puts coral at risk, as well as the water, should there be a spill, and so those definitely related, I think, to the EFH conservation mandate. David.

MR. WEBB: Thank you. Roger, responding to some of the comments that you just made as well, we're looking at, over the next few years, some kind of major infrastructure program being put in place, some of which we have to assume is going to occur in the coastal areas, because of the heaviest population there, and so this whole focus on the dredges and trying to get -- I think that's very timely, and there is change in the leases for oil drilling that were authorized at the very end of the last administration that have now been suspended, and it's obvious that those things change from administration to administration, and so I think, as we move forward, the prioritization needs to not get too literal about what the current status is for support for the work that's done by NOAA Fisheries and just figure out what we really need to do to prepare.

It might be helpful for us to try to take a couple of steps back, and, while there is no specific certainty what large or what kind of impact the infrastructure programs are going to have, it seems apparent that there is going to be something significant, especially in places like -- Anything done structure-wise is going to immediately impact the environment, both the nearshore waters and the offshore reefs and the managed waters, and so I don't think this is timely, and I would just urge the members of the AP to not get so sighted in on what's happened in the past and try and look at what the future might hold for us and at least incorporate some of the stuff you mentioned that we could come up with and help to prioritize and go forward. Thanks.

MS. DEATON: Thank you, David. Just so you know, when you talk, it's really garbled, your speaker or something, but I'm just letting you know. You can make it out.

MR. WEBB: Thank you.

MS. DEATON: Paula, go ahead.

MS. KEENER: I think David pretty much covered what I was going to say. I think, in looking at these chapters, one that really strikes me is -- I don't believe this was called out, and I think it was the dredging, the wind, and the SAV, and is that correct that those were the top three that were mentioned previously?

MR. PUGLIESE: Yes. The energy, the broader energy.

MS. KEENER: Okay. Thank you. I am trying to sort of really look at the more -- The global drivers, if you will, and be more forward-looking, and so climate variability in fisheries -- That's

huge, and that is -- It's not only currently happening, but that's going to be -- That is a driver now, a current driver, and it's going to be a future driver. We all know that, and so I'm trying to think -- I'm trying to put my forward-thinking hat on here and thinking about what are -- What should be the real priorities here, and it's not an easy question.

MR. PUGLIESE: Paula, I think the key is -- I think you brought up a very relevant point right now, is that, essentially, you have some crossover, especially with climate and the food web policies, to these other ones, especially climate, with the idea that -- I mean, they're all, again, related, because of the intent to try to look at advancing these that are addressing climate issues.

The foundation of some of the actions within climate are tied directly or can come from some of the work that's being done now, right now, finally, on climate vulnerability and on the ecosystem status and on the modeling, and there's a number of things that I think can advance a lot of that, but some foundational information that crosses over, because it's information to understand how some of these species are using SAV, et cetera, like that, and so I think there's opportunity to -- You know, it's not like you're throwing one out to just do the other, and I think we can -- As we go through, you can identify core areas that would be advancing in terms of policy revision and update and then actions under that, but then, under the other ones, you can identify priorities within the next two years, and so that's what I -- I think you can accomplish kind of both if we just kind of walk through that next step.

MS. KEENER: Yes, absolutely, and I absolutely agree with that, and, also, marine aquaculture. I mean, we are going to have to move, and we are moving, more towards blue food, and so that's something that we're going to -- We're going to have to address that more head-on, and so, again, it's not as easy, as we all know, as it looks. Thank you.

MR. PUGLIESE: Specific to that one point right there, one of the things that is going to be moving forward is -- I think I mentioned it before, when I touched on the marine aquaculture, is that some of the work being done in the Northeast, when I was working with the CCC Habitat Workgroup, were looking at all the impacts on the offshore areas, with a focus on wind, because of everything moving forward, but it also brought in the fact that there may be an opportunity to look at best management practices for aquaculture, because they're under the gun with the movement on the areas identified for aquaculture development, and so we may be able to draw on other regions' development for best management practices and accomplish some of the items under that specific chapter, that specific policy.

I think what you're going to do is have the potential to have some priorities under those individual -- As we walk through it, identify some of those as priorities, but then maybe these other ones are literally what policies may need to be revised, or updated quicker, because of some of the ongoing actions that are happening now, and so I think that's kind of a balance between those.

MS. KEENER: Great. Thank you.

MS. DEATON: If we are to think about what would be the least -- The lower priority for the council, I might suggest flow alterations, not because it's not important, and it's really important, but it's mostly from land use changes and things that are out of the council's control. Invasive, lionfish is bad, and, other than that -- Again, how -- I don't know, and there's less that the council can do regarding that, I guess.

MR. PUGLIESE: I think you're going down a really good road, because I think that was one of the intents here, was to try to capture not only what may be priorities under these different ones, but we're providing the inputs through the policies, but also that acknowledge that some of these -- How much emphasis you can place on it, and it really is going to have to come with other partners putting that type of information, like flow regimes by river systems. As it gets compiled, those could be integrated and highlighted into the FEP and into the policy, et cetera, into the future, but the responsibilities and the actual effort to do that is really being driven by groups that are either outside the bounds of what we have authority over or have the ability to influence.

MS. DEATON: Are there any others that people think would be a lower priority?

DR. LANEY: Madam Chairman, I will just jump right in there and say that I concur with the two that you suggested would be lower priority, and I will scroll back over the list here.

MR. PUGLIESE: It's really close, because, if you begin with what you started with, dredge is Number 1, and SAV and energy, or however those three work out, and the other one that came up was aquaculture, and then what you have is a backend, with 8 and 9 being invasives and flow. You can just figure out where kind of the other ones, at least kind of for a broader perspective, of how they may fall out.

DR. LANEY: Well, in looking back over them, I think that probably artificial reefs we could put in the lower tier as well, simply because we've had a recent update on that, and I would defer to Dr. Havel on that point, but I think the Gulf and the Atlantic artificial reef committees got together and updated their guidance document, and so I don't know, but I will defer to Lisa again, and I don't know that there's a whole lot of new information that's come to light since that particular guidance document was updated, and I think I think it's been done, and so maybe that one is kind of a lower-tier one as well, simply because more work has been done on it recently, and, also, the council put the SMZs in place for both South Carolina and Georgia, artificial reefs, to some extent, and so there's been some things done there that may relegate that to a lower priority.

I mean, there's always the ongoing age-old research question of aggregation versus production and coming up with, hopefully, some sort of standardized or uniformed approach to assessing artificial reefs across the whole South Atlantic jurisdiction, and so maybe it would fit in the lower tier, but, again, I see Lisa has raised her hand, and so I will shut up and let her weigh-in and say what she thinks.

MS. DEATON: Go ahead, Lisa.

DR. HAVEL: I agree with Wilson. I think it can be a lower priority. Regarding the reefing materials, that was being led by the Gulf States, and I haven't seen the final product. We were really close right before COVID, and then I haven't heard anything since then, and so I should circle back with James Ballard about that, but, when I mentioned possibly coming up with like standardized monitoring protocols for the Atlantic coast, most of the artificial reef managers laughed at me, and so that kind of died, at least from the Atlantic States perspective, and so I agree. We updated it a couple of years ago, and I would put it as a lower priority.

MS. DEATON: Okay. Rita, did you have something to add?

MS. MERRITT: Yes, and I do tend to agree with both Lisa and Wilson's comments, but I would say that, as far as the monitoring goes, at least in our area, I think that we've been lacking on the monitoring, and that should be a higher priority, from that particular standpoint, because -- I'm specifically referring to some, I guess, artificial material that's been put out over the years that is considered trial and error that needs to be monitored for its stability and all of the other positive kinds of things that we're looking for to occur from the artificial material, and so I think that it --

In general, it should be in the lower priority for the council, but not necessarily at the bottom of the list, just because it is something that does need some extra support, and I think the pandemic has been part of the problem anyway, and so I think that's probably why a lot of the follow-up to monitoring has not occurred, at least from what I've seen or heard about, and so that's all. Thank you.

MS. DEATON: Okay. I think then we have pretty much a high, low, medium type of categories, and so do you want to just start with one of the higher topics, Roger?

MR. PUGLIESE: Yes, and we can jump right into -- Let's go, I guess, directly to the dredge, because we're discussing that right now, to just kind of get a gauge on what under there may be useful to advance.

MS. DEATON: Before we start that, Paula has raised her hand, and so, Paula, did you have something to add?

MS. KEENER: Yes, and thank you. We don't need to go into a huge discussion about this, but is there some reason why the dredge chapter was separated out from Chapter 7, Alterations to the Marine, Estuarine, and Nearshore Flows?

MR. PUGLIESE: Yes, and those are -- It's because those are individual, stand-alone policies. One is addressing dredging and large-scale engineering, and the other one is specific to flow regimes in the systems, and so, while they could be addressed kind of in combination, those were separated to really get to the nature of those two different types of -- One being driven a lot by beach renourishment and sand sourcing and large-scale coastal engineering.

DR. LANEY: Can I chime in on that one too, in response to Paula's question?

MS. DEATON: Yes. Go ahead.

DR. LANEY: Paula, that one, as Roger said, was targeted more toward the rivers and the estuaries that, in general, in the South Atlantic, a good many of our rivers have been altered by dams, some of which were built for flood control and others for water supply and others for recreation and so forth and so on, and, to the extent that those modifications have altered the flow regimes in the rivers, then that, of course, alters the freshwater inputs into the estuaries, and so we felt that, because those impacts were occurring inland, and largely outside of the jurisdiction of the council, we split them.

MS. KEENER: Okay. All right. Thank you. That clarifies it. Thank you.

DR. LANEY: You're welcome. Does that help?

MS. KEENER: Yes, it does. Thank you.

MR. PUGLIESE: So what I'm going to do is I will identify -- Anne, that's probably a really good way to do it, is high, medium, low, because you have like three in each category, and I think you've identified the top three and the bottom three, and so I think you can get to there, and so that starts the process, but here is the chapter on beach dredge and renourishment and large-scale coastal engineering, and what -- The idea here is to -- Let's go directly to the actions under the policy, to look at and focus on either what's been completed or begin the discussion on potential priorities.

Under this policy, what I've done is just identified those two kind of designations, and, also, the assumption is that other ones would be future priorities, as available, or, within this scope -- As I mentioned, and has been highlighted before, things that are really truly going to be accomplished, even within high-priority areas, that may still be accomplished by other partners or outside of our area.

Let's start by walking through quickly. The first one really has to do with just providing the policy out to our partners, and it has been provided, over time, a number of times now, and so that's where I get this essentially completed. It is provided and is also available on any comments associated with this, and we've attached or highlighted the links online, because all of these policies are available online, and we also include a chapter in all of our FMP amendments that has -- It highlights all of our EFH and EBFM activities, which highlight connections to these policies, also.

This is identified as completed. However, completed with the caveat that, as it gets refined and revised and updated, that then there be basically an attempt to move that, to also redistribute and re-coordinate and make sure that -- Understand the new policies, and then those are also provided.

That moves us to Action 2, providing -- This is some very specific recommendations that were included as an action here, and I guess this is the opportunity, with the development and refinement of the policy, to make some of the recommendations, specific on grain size and compatibility, ecological, et cetera, and so that's why I dropped in this, because you're going to be in that process, and we'll see if you all think that's appropriate.

MS. DEATON: I think that, as you get into limited sand resources, and potentially less suitable substrate, that's important, but I do know, in North Carolina, they seem to be easing away from the -- At least the monitoring for the grain size.

MR. PUGLIESE: That's why it's being brought up. Is this still relevant, because this was brought up as a priority before for opportunity as an action. If it's not something that needs to be addressed under this revised amendment, then we can just identify that.

MS. DEATON: I mean, one concern is though how does this South Atlantic policy -- If it says to do that, how do you make a state, state regulations, require it? I guess National Marine Fisheries Service could. I will let Cindy answer that.

MS. COOKSEY: This is something that we actually have a friend in SARBO. They deal with some grain size compatibility issues, and I would highlight that the U.S. Fish and Wildlife Service

is actually an important co-agency, when dealing with grain size, because of their sea turtle -- Once the sea turtles hit land, they become U.S. Fish and Wildlife Service's ESA-designated species, and they provide a lot of oversight on grain size compatibility and compaction issues, because of the potential for adverse impacts associated with that.

At least in South Carolina and Georgia, this is a very common recommendation, and it's still required that potential borrow areas are surveyed for compatibility and that compatibility is monitored during the placement of material, and, I mean, it's absolutely critical, and it's long been identified that matching grain size, having each compatible grain size, is important from an ecological standpoint, and it's also pretty important from a human use standpoint. Humans really dislike rocks on their beaches, and I don't blame them. I'm one of them, and they also don't like being sucked down into sand up to their ankles, because it's so fine and silty.

It is important, and it has to continually be highlighted, because it is expensive to be done properly, and, as others mentioned, including myself, as sand becomes harder to find, there is a tendency to want to go into more of the habitats that are only borderline compatible.

MS. DEATON: Thanks, Cindy. Wilson, did you want to add to that?

DR. LANEY: Yes, ma'am, I did, and I concur 100 percent with what Cindy said, and there was a very dramatic example in the book that I referenced earlier this morning, in Cornella Dean's book, *Against the Tide*, about saving beaches. She notes that she was walking on one beach, and I think this was -- I don't want to misquote her, and it might have been a New Jersey beach, and I'm not sure, but it was somewhere north of North Carolina, and she noticed a large galvanized nail lying on the beach, and she wondered why it was exposed and hadn't sunk into the sand, and so she picked it up and plunged it into the beach and noted that it only penetrated one-quarter inch into the substrate, and so she was dramatically making the point that we don't always get it right, from a grain size compatibility perspective, and so, yes, Cindy's points about rocks were well taken.

Anne, I don't think John Ellis is back on the call, but I think you and others of the North Carolina delegation are well aware of some of the issues that we've had, I think at North Topsail Beach, maybe, and also maybe Atlantic Beach, with a lot of rockiness, and not only is it incompatible, from a sea turtle and/or human perspective, but I know that the communities that are securing the substrate for filling their beaches, building their beaches back up again, certainly don't want the rocks in there, because, as a result of those Fish and Wildlife Service requirements, under Section 7 consultation, the rocks, in a lot of cases, have to be removed, and that's not a cheap undertaking, and so that's another reason to try and get it right the first time. Thanks.

MS. DEATON: Thank you, Wilson. Okay. We're keeping that one, right?

MR. PUGLIESE: I just added it in to address under the policy revision, and I highlighted SARBO and the U.S. Fish and Wildlife as partners. Moving on, Action 3 is work with SEAMAP South Atlantic to prioritize topographic mapping of the ocean bottom, and I think this was to try to get as much information on the soft bottom sand distribution, and there's a lot that has happened with the work that BOEM has done that we could draw on and access the available information, to expand the existing information on habitat distribution that we have for our existing online systems, eventually, so that we have a full distribution of those areas highlighted.

It's really beyond -- We identified SEAMAP South Atlantic because that's where we started with a lot of our coordination with the bottom mapping workgroup that I chaired, and so that has some influence, and I connected that into the group, but it's a broader issue than this, and opportunity, I think, exists, if that's available. Whether that needs to be a priority under this right now or it just can occur as the information builds, that's you all's call.

MS. DEATON: Cindy.

MS. COOKSEY: With this item, I think it's very forward-looking, in that, eventually, we are going to have communities having to go further offshore and into federal waters, in order to access compatible material, as many places have already used up all their compatible material, and other places are getting close to it, but, for those areas that are inshore, a lot of those efforts, the BOEM effort and the SEAMAP, they don't work in the depths where most of the -- Currently where most of the borrow area surveys are going on.

This is great from a forward-looking perspective, but how can we alter it to deal with the current reality of folks are going into nearshore areas, and they're trying to access shoal complexes, and how can we encourage that kind of identification and sharing of information, to ensure that they're going into the appropriate habitats and being able to speak towards providing them very explicit information on what habitats to avoid, really rigorously stating that the shoal complexes have to be avoided, and these are habitat areas of particular concern, as part of our coastal inlet structures. That kind of thing I think might be of greater short-term value, whereas the priority mapping with SEAMAP might be greater long-term future value.

MS. DEATON: I think that type of specificity would be great to include, and I'm just thinking about a meeting we had about Jaybird Shoals, in the mouth of the -- Right outside the mouth of the Cape Fear, where the borrow area was used by one town, and then another town wanted to use the same shoal, and we asked to see the results of recovery of the first shoal, but it was a different town, and then, when we did get the data, it didn't show any recovery.

They said that was because the hurricanes had moved the sand on the shoal and were told that we might want to map the whole shoal, to figure out the status of the sand on that system, and so I think mapping those areas should be a requirement, not just the immediate borrow area, but because there can be shifts all around it. If it's going to be more than once, it should be required.

MS. COOKSEY: I have yet to be aware of any borrow area that has recovered enough for it be harvested from again in the coastal ocean environment. Now, if anyone knows of a borrow area where the exact same borrow area has been harvested multiple times, I would love to hear about it, and where it's located, the depth that it's located in, how they harvested from it, all of that information, but I have yet to hear of any full recovery that allowed it to be harvested from again in the coastal ocean environment.

MS. DEATON: I think the borrow areas off of Carolina Beach, North Carolina did, but I will check on that, but they did very long, narrow trenches, for that reason, so that it would fill in faster.

MS. COOKSEY: So they had the side material kind of collapsing down into the troughs that they created?

MS. DEATON: Maybe.

MS. COOKSEY: Because that's kind of what I've seen with some borrow areas that are used more than once, and it's that they -- When they initially use the borrow area, they only collected from a portion of what they were permitted to use, and so, when they say that they've gone back into the same area, they're still actually harvesting new material, usually because it's too fine and silty, what has filled back in, to what they previously harvested, even if it's been quite a while.

MR. PUGLIESE: Okay. Does that get to identifying -- That action is really a long-term priority, and it's not something that would be accomplished -- A near-term priority would be making those recommendations and highlighting that in the policy revision, or something else.

MS. COOKSEY: To me, I think, in some ways, helping to identify these long-term, in fact potentially permanent, impacts from borrow areas that have already occurred -- May that help us create the case for the need to protect the shoal complexes?

MR. PUGLIESE: Really, it would be both. It would identify the need, so that you would be able to collect the information to better characterize and then protect those areas. This is just a start, and I think what we can do is wordsmith to get exactly what you would like on here.

MS. DEATON: That could almost be a separate action, what Cindy just suggested, because it's actually about prioritizing topographic mapping. It could be. That's something to work on.

MR. PUGLIESE: I will add that in. Let me just add that in there, and we can -- Let me leave that as the other one, and drop this, and -- Cindy, if you could just restate that, and I will put it back here, and then we can just move on, because I think this at least gets to the core of the discussion, and the intent I think is pretty clear now.

MS. COOKSEY: The need to conduct mapping of the nearshore environment that is currently targeted for borrow sites and a better understanding of what has happened, or the potential of recovery, or lack of recovery, in historic borrow areas and to use that information to improve our policies regarding selection of new borrow sites.

MR. PUGLIESE: The recovery of existing borrow sites?

MS. COOKSEY: Yes.

MS. DEATON: I think you've got that combined, and it should be like a period after -- Conduct mapping of nearshore environments targeted as borrow sites. Then the second piece is determine recovery of past borrow areas -- Existing or past.

MS. COOKSEY: I think that will help inform our recommendations on borrow site location, or borrow site siting.

MR. PUGLIESE: Okay. Does that capture at least the core of that?

MS. COOKSEY: It does, and, just to put this out there, and I have no idea how it happened, but maybe the folks that are really good at GIS and developing all of these blueprints -- The Corps of

Engineers actually requires a fair bit of mapping from applicants, as part of this process, but I don't know what happens to any of that information. Is it stored somewhere with the Corps? Is it not considered public information? It seems like there could be the potential for tapping into some existing data, via the Corps of Engineers, that might address this, rather than having to create a program that sends new ships out, and maybe there would need to be something to fill in data gaps, but as a potential area of harvesting information, and that's just a thought.

MS. DEATON: That's a good point. I know it's been brought up in the past, where all these old bathymetry surveys are. Wilson, go ahead.

DR. LANEY: Thank you, Anne. I'm just concurring with Cindy again, but, also, suggesting, and I guess this is an appropriate place to put it, that we also need to -- An action we need is to try and compile all the existing information on the use of these sand shoal, inshore sand shoal, areas by not only protected species, but also species that are the subjects of fishery management plans.

I would reference, in that regard, a very recent paper, and, as a matter of a fact, I think it's this year, and I think I distributed it to some of you, that was undertaken in the Gulf of Mexico by all of those researchers who are putting acoustic transmitters in different species. They published a nice paper summarizing all of the detection information, and I have -- I sent that to a number of our colleagues who I know are doing acoustic telemetry work on the east coast and suggesting that it would be very beneficial for them to compile that information as well.

We all speculate that some of these species may preferentially use these sand shoals for some reason that may or may not be known, and one example I will cite, and I think I can credit Lisa Wickliffe and her co-authors for this observation, but they took all of our Atlantic sturgeon offshore data from the cooperative winter tagging cruises and produced a heatmap, and, if I'm remembering correctly, Cindy, Lisa said that some of the sturgeon hotspots definitely seemed to correlate with sand shoals offshore.

I know that we used to routinely catch them on shoals off -- Not too far off the mouth of Oregon Inlet, and other things like that, and so I think it would be very useful, where we have such information, to compile all of that, to help build a case for why these sand shoals and inlet ebb and flow tide deltas are important places, and, again, it's not just the subtidal portions of them, but it's intertidal portions of them that are important for foraging for species like summer and southern flounder, and, on the ESA side, piping plovers, for example, and other shorebird species.

Then, finally, I would love it if we could quit using the term "borrow area", because I have always contended that was a terminology that certain segments of society came up with to diminish the impact of mining sand, which is what it really is. It's sand mining, and I don't know of a single case where the borrowed material was ever put back where it came from in the first place, and so maybe should be a little bit more realistic and just sand "mine sites", or something like that, to really reflect what these things really are, because they don't borrow anything. They permanently take out, and it may -- Some of the sites, as Cindy noted, or as Anne noted, maybe get material back in them again, but, as Cindy noted, that could result just from the collapse of the trench walls, and so what they're really doing is still removing new material. They're not moving anything that got transported in there from transport, and so I will shut up and let Rene jump in there.

MS. COOKSEY: Before Rene jumps in, Wilson, I agree completely on the terminology, and it's designed to make people feel good about the sand mining and the filling, but it is easy to slip into it, because it has become the typical nomenclature that is used.

MR. PUGLIESE: I replaced the one, at least in this statement, for now, with "removal".

MS. DEATON: Go ahead, Rene.

DR. BAUMSTARK: I would agree that it's a great point you make, Wilson. The naming is a little deceptive. I wanted to add a point that is somewhat management related, and not specific necessarily to borrow sites, but there is, in Florida -- Well, probably not specific to Florida, and I'm sure the rest of our states here share this issue, but there's a general -- Among the benthic mapping community, there's a general -- It's generally acknowledged that we don't understand how sands move very well.

This is particularly an issue for us when we have these storm events, hurricanes, and we have, in some cases, hardbottom habitats or different types of habitats that become covered or uncovered, and we just don't have a good handle on that, even beyond just the ones, but storm events, in particular, are something that need to be considered, and so, along those lines as well, there, I believe, needs to be some temporal component to any study of how these sands move, and, in general, it would be helpful to the body of knowledge to better understand the movement of sand, not just for borrow sites, but to provide more relevance to this point, and we could say, just in general, understanding for habitats, and that is an important missing piece.

MS. DEATON: Okay, Wilson. Go ahead.

DR. LANEY: I'm just going to say that I totally agree with Rene, and, Rene, read Cordelia Dean's book. She talks about that a lot, and there is a lot of information in there, and this is where our Corps of Engineers partners can really come into play here, because of all of the tremendous amount of research that's been done at the Duck Pier in North Carolina.

There is a lot more understood now than there was historically about how sand moves, how it forms offshore bars, what it does seasonally, where it goes in longshore transport, and I am sure, given that Ms. Dean's book was written in 1999, there's probably even a whole lot more information out there today, if she were to update her book to 2021, and so I agree that should be an important action and an important part of the policy.

I guess what we would do there, Roger, is to just put in an action for the AP to delve into the literature on sand transport dynamics and just summarize what present understanding is, now that, as Cindy I think already noted, it's complicated. It is very complicated, and Ms. Dean makes the point in her book that every single beach is different, and every single site is different, and the Corps acknowledges that Duck is different, because it's a largely undeveloped beach, and so, just because they understand how things work at Duck, on the North Carolina Outer Banks, it doesn't necessarily mean you can take that information and apply it to any other beach anywhere, and so it is a very difficult and complicated situation, and I would say, if we have to prioritize actions here, we certainly need to understand where the material is.

I think it's extremely important that we understand which species are using these areas, and, to the extent that we can understand it, why. Why are they there? Why are the -- Sturgeon in particular, why do they like to use sand shoals, and what are they doing when they're out there? In some cases, you can't cut open sturgeon to see what they're eating, but you could get a permit from NMFS to do gastric lavage and look at their food habits, and some of us have speculated, in the past, that there's a particularly desirable prey item that may be associated with sand shoals, or it could be a cover kind of thing.

They could be using the areas in between natural microhabitat on the bottom, and so that sort of thing, but, yes, I certainly agree that it's important for us to understand the sand transport dynamics, and, from a perspective -- This one, by the way, where it should be a win/win, and I think Rene would agree, and everybody else would agree, because, when a community spends the money that they do, or when a federal agency spends the money that they do to put all this sand on the beach, they want it to stay there as long as it can stay there, and certainly --

I won't speak for the Fish and Wildlife Service, but, when we require these sand compatibility studies, we certainly want compatible sand put on the beach, to create at least a useful sea turtle nesting habitat, and we would certainly like for it to remain in place as long as it could too, and the key to all of that is understanding sand transport dynamics, as Rene said, and so, again, read Dean's book, and we could also do a great deal, I'm sure, to try and compile the existing literature and generate an understanding of sand transport dynamics. Thanks.

MS. DEATON: Thank you, Wilson. A lot of these are related to research gaps and needs to understand impacts and to minimize impacts, by adapting to what we learn, and I'm going to send -- I will find and send the BOEM report, and they had a two-day workshop last year, and they were really focused on Frying Pan Shoals, but Pig Shoals in general, but part of that was to identify research needs, and so that might be of use when the policy gets rewritten in more detail.

MR. PUGLIESE: I think you're getting to kind of the guts of some of the key things to address in the policy, versus maybe some of the -- It's kind of that issue that I raised before about the action versus like the input on the policy, and so I think it's good, because this is a lot of things that are really going to help advance that discussion and highlighting other information, other sources, of things, plus also specific guidance on what can be addressed to deal with how the policy gets revised I think is coming out, and so this is all good.

MS. DEATON: Okay. Trish had her hand up. Trish, did you have something to add?

MS. MURPHEY: At the risk of sounding crazy, but listening to the -- This states that you need bathymetric and hydrologic information to develop maps, and would the Navy be a good source for that, because the reason I suggest that is -- This was back in the 1990s, and I had to attend a scoping meeting for the Navy, and they were going to do some wargames out in the Atlantic, and I had a lot of stuff to comment on, but what I noted was they had an incredible amount of data, and I'm just thinking bottom -- Knowing the bottom, that seems like a pretty important thing, if you're a submariner, and so, just at the risk of sounding a little crazy and out there, is there a chance that they may have some of this data that we've been talking about? Mel Bell may be able to weigh-in on that.

MR. PUGLIESE: One thing on that is most of the focus in our discussions and coordination with the Navy, and it's a shame, because Laura Busch is on the AP, and it would be nice if she kind of weighed-in on that. They provided a really significant, and some of the most detailed information on habitat mapping and everything on some of the deep -- When we were dealing with the Coral HAPC, the deep section, where they had the range identified, and they mapped and characterized these ROV and shared a lot of the detailed information. We just have never kind of checked in with them on nearshore areas.

I have a feeling that there's going to be some of the confidentiality, especially if you're talking about around facilities, but, if they're done in larger areas, it's worth investigating, because, as I said, in the past, we have had the opportunity to benefit from some of the most comprehensive mapping and characterizing they did offshore and were willing to share, but we can engage Laura to at least investigate what the possibility might be.

MS. MURPHEY: I just remember that I was just impressed with how much data they had for the scoping meeting that I had attended, and, granted, that was back in the 1990s, but they had a lot of habitat information.

MS. DEATON: So I guess you're not crazy, because they have that, and they have provided it, and so great. Rene, did you want to add something?

DR. BAUMSTARK: Just on that point, and maybe we haven't gone about it properly in Florida, but the Florida Coastal Mapping Program, specifically, and others, in general, have reached out to the Navy, and we've included them in workshops, and we haven't had a lot of luck, I believe because of issues with classified data, and we have requested higher-resolution data, but, if folks have had success, I would really like to know more about how they went about -- What channels they used, and I think I brought this up to Laura as well in the past, and I don't believe we followed-up on it, but, in Florida, we haven't had a lot of luck, and I agree 100 percent that more than likely -- I'm sure there is excellent, high-quality side scan, as well as good bathymetric data that would be extremely valuable and fill in a lot of the gaps.

MS. DEATON: All right. Mel, go ahead.

MR. BELL: Nothing really to add, and Trish is right, and Roger knows about some of the connections and all, and Rene is right. Some of it has to do with classification levels and things, but, yes, they do have an awful lot of useful, or useful to us, data, and it is a matter of kind of making the right connections at the right time, but some of it can be shared and some of it perhaps not, but, yes, they do have quite a bit.

MR. PUGLIESE: To follow-up on Mel, one thing that I think is really important is the timing. Right now, everything is under the gun for the 2030 map the entire coast by 2030, and it's got a lot more significance than people, I think, realize. It will happen, and so the question is to what degree and resolution some of those near-shore areas may actually end up into the overall system that provides the information, and we have collaborated really closely with NOS in the past, on some of the efforts where they've been building information on prioritization and engaged other partners, such as the Navy, and so it would be interesting to see, or at least follow-up, if that might -- The fact that that is ongoing might open the door to some -- If nothing else, maybe the lower resolution, but maybe still useful information in the nearshore areas that comes from that system.

MS. DEATON: Remember when Christine Buckel from NOAA came and spoke to us about the project they're doing? It's kind of like a metadata of sand resource studies that have been done, and so they're working on that, and it might be -- I was at one of their planning meetings, and it wasn't just sand information, but bathymetry, because that is an indication of where the sand is, and so it might be worth reaching out to them and see if they could be the coordinator of all this, because it's a job right there to get all that information and get it compatible, or somehow usable.

MR. PUGLIESE: Christine is with NOS, right?

MS. DEATON: I think so, yes.

MR. PUGLIESE: Because I was involved in those broader -- Some of the other mapping efforts that have been run through the group, the prioritization mapping for offshore areas, and so, yes, we can definitely put that on the list to follow-up.

MS. DEATON: They will give a user access, and then you can enter like into your grid of where you have information, and you just put basic metadata of like what it is and when it was done, and then they can use that from there.

MR. PUGLIESE: Actually, I was going to share that with the AP and the council. I mean, literally, I think the publication of that document and that effort just came out, and so we might immediately know what the reality of opportunity is to get other information. Are there any other major areas to address under here? I think you guys have really shored up a lot of to-dos, both under the policy development, but also that are priority actions that address specific needs to look at impacts on designated EFH.

MS. DEATON: This might be something that would just be included in the policy edits. We're talking about like the need for time-of-year restrictions to be mentioned, and things like frequency intervals, and I guess it would be criteria of beach nourishment projects that minimize impacts.

MR. PUGLIESE: What was the second? Need for time-of-year restrictions and -- It's basically what we've been discussing.

MS. DEATON: Criteria to minimize impacts.

MR. PUGLIESE: We've got them here, and so it can be a balance between addressing that action as a longer-term priority, and so that one individual action under the thing is separate. A lot of this is things to address as you're developing the revision to the policy statement. Okay. I think we're ready to move at least down to the next, although Wilson's hand is up.

DR. LANEY: Just a quick one, Roger. Anne's comment reminded me that, on Pea Island National Wildlife Refuge, and, Anne, you and some of the other North Carolina folks may remember this, but, given that NC DOT got a special use permit to put a terminal groin on the south side of Oregon Inlet, the Fish and Wildlife Service was able to stipulate a lot of conditions to that special use permit, and sand bypassing was one of those, and Dennis Stewart, who was the refuge biologist at the time, working with Dr. Bob Dolan, and I think some of Bob's graduate students, and I

mentioned this last fall, developed what they believed to be a better process for putting that material on the beach.

Instead of just creating a uniform beach profile from Point A to Point B, they deposited the material in more a natural pattern that was sort of a cuspate-type of shoreline, and Dennis and Dr. Dolan published some papers on that approach, and, again, I mentioned those last fall, and I don't think that I ever pulled those out and provided them to the AP, and so that would be an action item for me to take up and talk to Dennis and make sure I've got all of those electronically, so I can send them out, but there are -- The point being that there has been some research in the past on how to best add the sand to the beach, to minimize the recovery time for creatures like emerita and donax, and it also -- I don't know, but it might have some effect on the longevity of the sand on the beach as well, and I don't know. I don't remember that that was a dimension of it.

I know that, from a Fish and Wildlife refuge perspective, they were trying to minimize the recovery time for the surf zone organisms and any impacts on the surf zone, to try and maintain the optimal utility of the habitat for the fish and birds and sea turtles that use it, and so thanks, Anne, for that comment that reminded me of that.

MS. DEATON: All right. Are we done with beach nourishment?

MR. PUGLIESE: Yes, because the last one was just the policy, and, again, that would be -- Like the priority for 2021 would be distribution of the revised policy, as it gets developed, and so, yes, we are done with that, and we can, I guess, move directly below to another high priority. The other high priority was SAV, and so it's either go to energy or SAV, and which is your preference?

MS. DEATON: Let's go right there, because you're right there.

MR. PUGLIESE: Okay, and so I've identified it as high, because it's one of the top three that you all identified, and so let's move directly down into here, and, under the first -- Again, this is providing the policy, and the policy has been provided when it was developed, as completion of the FEP II, and there's access online, and then, as the council has been commenting on either actions or on activities, such as seismic testing, or on the long-term oil and gas planning documents, the policies have been provided through those. In general, that is completed, and I guess you could put the same kind of caveat. As this is -- If it's anticipated to be updated in this timeframe, that that would also be distributed, a priority for distribution, once revised. We could add that later or think about that.

Moving on to Action 2, this is really trying to highlight the reduction of impact between managed areas and activities, and, again, this has got to do with providing maps of information on fisheries and on habitats and on managed areas, on essential fish habitat, as the process, and we identified this. Again, this is one of these ones that is completed as of the council's actions relative to that, because a very specific example is sitting down and working with South Carolina Coastal Zone Management and South Carolina DNR and providing all the information we had on -- Fishery-independent survey information on managed areas, on EFH distributions, on reef habitats, and species, and that being integrated in their process and review, CZM review, of seismic testing, which they ultimately found not in compliance.

Action 3 under this is mainly a directive that the council review and comment on activities, and it's somewhat the same kind of a connection to providing the input on the activities, but it gets to this issue of monitoring, compliance monitoring, which we haven't been able to really -- Maybe the request is made through the broader EFH consultation process, but there hasn't been action specific to that, and this is -- Other than in the policy, or in the comments, something that, in terms of the mandates under the consultation, or under permit requirements, that actually is outside the bounds of kind of what we could require, but it would be a partner, and it would be either through NOAA consultation or partner input.

Under Action 4, this is, again, getting to -- In this case, it's pointing to our partners in the region and other federal agencies on the availability of the information on EFH and on species and on habitat and fisheries that we have through the digital dashboard and through the GIS portal, all the different web services we have, and, as we have been coordinating with our partners with BOEM, with the individuals working on the wind projects, like Kitty Hawk Wind, all these different areas have been highlighted, or accessed, and I think, to a great degree, especially as we go into the wind discussion later on tomorrow. A lot of that, I think, helped guide some of the early moving of the area away from managed species or habitats that were potentially impacted, and so I would say, to some degree, this would be completed, but ongoing.

Here is one, working with federal agencies to identify information gaps and prioritized research needs on non-fishing research, and relative to siting, species interactions, and offshore facilities. This is one that is very timely, because I think one of the things that, as we're working with the partners, we've been trying to highlight that, as we're working with our BOEM partner on the AP, as well as the wind development groups, to provide guidance, so that information can be identified, but maybe there's an opportunity here, with the work that's going to be happening with the CCC habitat workgroup.

One of the things that's going to come out of that effort this year is to begin to point towards best management practices for the wind activities, an opportunity to draw on activities done in the Northeast area on some of those areas, but I think highlighting, in the Southeast, and I've already talked with Rick Robbins about engaging on that, is to highlight how a lot of that preplanning and prework provided that, and so I think this is something that the AP could really weigh-in and integrate into a revised policy, is taking some of the information that's coming out of those practices and integrating that and building that relative to other activities. Are the thoughts from members on that?

DR. LANEY: I will jump in, since I have my hand raised. Would you scroll back up to Action 2 for a second, Roger? It occurs to me that this one certainly has an overlap with climate change, for sure, in that, as species distributions shift, as socioeconomic factors come into play, and effort may sometimes reduce, may sometimes increase, even though we say it's completed, and I would agree that's largely the case, we still need to consider the shifting distribution of resources and the shifting distribution of effort.

I don't know what -- Maybe the what to put here is that we need to be attentive to how climate change is affecting things, and maybe specify some target interval for when we relook at Action 2, and I don't know, but maybe every five years, which would sort of coincide with when benchmark stock assessments are redone, and that might be a good correlated type of activity, and I will just give an example.

So we would, at one time, prior to 2011, have stated that a priority fishing area for striped bass in the ocean in North Carolina would have been the Outer Banks. Well, that is no longer the case, because the striped bass have shifted their distribution north to off of Virginia and out into the EEZ, which is a good thing for striped bass, because they are -- A lot of the brood stock are out there during the wintertime, and they are effectively protected by the fishing prohibition, but that's not a good thing for fishermen, because the gillnet, trawl, and haul seine allocations for North Carolina have gone unrecognized since 2011.

We all know that other species, and blueline tilefish comes to mind, and black sea bass comes to mind, are shifting northward, and so those priority fishing areas are going to change, and then, also, there's been discussion about the fact that, because of the infrastructure to support wind turbines, those could come into play as fish structure, and might possibly even become priority fishing areas, to the extent that you can minimize the potential for any damage to the infrastructure by fishing vessels and that kind of thing, and so I think those are some factors that come into play for this one, in particular.

Then I did have a question, since we're still on energy here, and I know that, for the moment anyway -- Is it a fair statement to make that oil exploration and drilling is not as high of a concern as it was, and is seismic testing totally dead in the water, for the moment, and we don't have to worry about that at all for right now, or is something that still needs to be on our radar screen?

MR. PUGLIESE: Well, we have Brian is online, and I don't know if he wants to weigh-in, Brian Hooker, our BOEM representative. I'm not sure he'll go as far as saying everything is dead, but, given the present situation --

DR. LANEY: I'm not saying it's dead, but maybe just --

MR. PUGLIESE: Nothing is ever gone gone, but I think the focus now is on renewables.

DR. LANEY: Right. Maybe deferred for a while, but, if Brian wants to weigh-in on that, he can feel free to do so, but, at least temporarily, I guess it's not as high of a priority as some of the other things in this particular chapter.

MR. PUGLIESE: I think we'll hear a lot from Brian on the ramping-up of when I think everything is going to be so focused on renewables in the near term, and that's one of the reasons that he's kind of going in and out. He's buried up to his ears, I think, about the actions that are going to be coming down and the move to advance some of these efforts, which is, I think, one of the real opportunities for the panel and for the council to provide guidance in the revised policy, to advance those as they're moving quickly.

MS. DEATON: Also, I think you -- Even if oil exploration isn't as imminent a threat right now, it -- You don't want to develop the policy once it is a threat, and you want to have it ready, so that you can have maximum benefit from it. Where are we at?

MR. PUGLIESE: Where we ended was on Action 5, because what it did is it highlighted the opportunity to compile these research needs and the opportunity to build on --

MS. DEATON: I was going to say, on Action 5, hasn't that already been done? Has it been done, and is there a document out there that has research needs and gaps regarding offshore energy?

MR. PUGLIESE: Well, I think a number of the different BOEM documents have been developed to support research and then provide additional -- With input from partners in the region and priorities for the future, and, as you remember, Brian usually brings forward what has been accomplished and then identifies at least what has been provided to them as priorities for the future and looks for additional input, and so, yes, you could essentially say that some of it is completed, but there's an opportunity in this one specific issue, with regard to a focus on wind, because our policy never did get into the level of detail that I think some of these things may provide for that discussion.

I think, from the broader standpoint of the research needs and information gaps, I think BOEM has gone through a number of iterations to get to both -- Especially with regard to some of the renewables in the more recent times. Is that appropriate to have here? Do you all want that as a priority, to try to at least look at what might be there for potential integration into future policy?

MS. DEATON: Yes. That sounds good. Wilson.

DR. LANEY: Just hearkening back, and maybe it's more appropriately developed under the aquaculture chapter, but we did talk -- I mean, I touched, a while ago, on what the potential is for offshore wind infrastructure, to basically constitute an artificial reef of sorts, and I know there's been a lot of interest on the part of the commercial community especially, but also the recreational community, about the potential for fishing activity around wind turbine and placements, and I know that Rick Robbins is addressing that and has touched upon it in his presentations.

Do we need to put any sort of an action in here relative to further exploration of such opportunities, or is -- I mean, it could be fishing in public trust waters around the wind farms themselves, and then, if we get into it in the aquaculture chapter, that's going to be more of a discussion about the compatibility, maybe, between aquaculture operations and wind turbine or wind farm emplacements, and there's some slight difference here.

I mean, basically, we're talking about some sort of fixed aquaculture operation that would be compatible with wind turbines versus mobile recreational fishing or commercial fishing enterprises that also would have to be compatible with renewable energy emplacements, and there are some differences, but, I mean, the intent, in both cases, is producing food, domestically-produced seafood, for the U.S., but there will be some differences, and so maybe we put it in both places, and I don't know. What do you all think?

MS. DEATON: I think it might be more appropriate here than in aquaculture, because you're asking for this artificial structure to try and accommodate another use, or other uses. Well, I don't know. I don't know which is greener. It could be cross-done in both.

MR. PUGLIESE: I think Paula has a question.

MS. DEATON: Go ahead, Paula.

MS. KEENER: It's just following-up on this point exactly, and that is that these structures, and areas around these structures, can be potentially for multiple purposes, and so this multiple use piece -- You know, sampling of DNA, monitoring of sound and sea, sampling of microplastics or nanoplastics, and there's any number of multiple uses, and so perhaps addressing the multiple-use concept here, and whether or not we mention it in aquaculture or not, but I think certainly you're addressing the multiple-use element here, and it's important. Thank you.

MS. DEATON: Yes, I like that.

MR. PUGLIESE: I'm glad you brought that up, Paula, because that's something that I've been pushing a long time on the wind discussions, is opportunities for it to connect in with the ocean observing platforms.

Ultimately, when these go in, there is the ability to begin to use those as sampling platforms, and I was talking to Rick Robbins the other day about there is limited pelagic monitoring capabilities, and, if you could integrate that, that actually may be a way to have a pelagic location and to have some acoustics within those areas, and with the anticipated use by species like dolphin and king mackerel and others, and there is some real opportunity. I think that Anne is really right, or you were really right, about having this being probably the more appropriate place to talk about multiple-use connections. Anne, any other thoughts, or should we just keep on moving?

MS. DEATON: I agree with that, and I think we leave it there.

MR. PUGLIESE: Okay. Let's go ahead and move on, because I think that captures a lot, and we can move beyond that, especially if you are looking at an anticipated refinement of the policy. That moves us to Action 2. Again, that's providing the information and the policy, and that has been provided in the past, and it continues to, as we cooperate or work with NOAA Fisheries Habitat Conservation, in their consultations or in council-direct comments on any of these activities.

The Action 3 is looking at best management practices, and I think this was really targeted towards some of the discussions that we had with the original LNG projects that were drawing ocean water, most of which are -- None are going the other direction, drawing in, and ocean placement, at least on the east coast now. Any thoughts if this needs to still be addressed at this time?

MS. DEATON: You're saying that they aren't doing that anymore?

MR. PUGLIESE: Well, the big push, originally, was to bring in LNG, in Florida, and they were looking at the closed versus open loop systems and the amount of water being drawn and areas that may be pulling directly from where you would have larval species, et cetera, and, with the change in the way the whole energy system is, it's flipped around, where what you've got is LNG activities in the Gulf sending liquid natural gas to systems that would be --

So I think most of those are probably inshore or nearshore, and they're not some of these offshore systems that they were really going to do when they were doing that, and so it may not be as significant, but we can get clarification. We can raise this with Brian tomorrow, just touch base with him on this. A number of these, I think, while they're actions, those, again, could be issues

that could be addressed under if there is a policy revision, to specifically list -- If that still is an issue, that can be clarified.

Then Action 4, again, is the providing a policy, and, wherever that is in here, it could just be identified, especially if it's on these high-priority areas, where the policies could potentially be developed in the next two years, that the revised policy would just basically be followed up, and that pretty much wraps up energy right now. Any other thoughts before I move on? It's getting late in the day, but you're accomplishing a lot and getting to the nitty-gritty of this.

MS. DEATON: I think we're good.

MR. PUGLIESE: Like I said, it's as close as we can get to our breakout sessions that we used to have, and so, hopefully by October, we may be able to have some of those kind of hands-on, live activities.

DR. LANEY: Roger, for that, we were in Chapter 7 on that, for that LNG discussion? That was in flows, right?

MS. DEATON: No, that was --

MR. PUGLIESE: That was in 6, and I'm going to double-check to make sure that that was the right -- Because the only flow that I can think, relative to energy, would be with regard to the draws that were being pulled from the ocean water.

DR. LANEY: Right. That's what I thought, and so that's why I was thinking we might have gone into Chapter 7.

MS. DEATON: Unless it was about hydroelectric dams.

MR. PUGLIESE: Let me double-check the energy side of that. That also may be part of it. Those are the only water-related ones, and I think that actually is the hydro. That's probably one that you added, the hydro, originally. Should we go back to that?

MS. DEATON: Maybe we should wait for clarification. If it is for LNG -- Well, whether it stays or not, it should be probably be reworded to be clearer what it's talking about. I think that first bullet is still important, and I feel like -- Maybe not by the council, but I know that Florida has maps, and I know that North Carolina has maps, and we have workgroups looking at how to improve it and what are our data gaps, and I feel like those maps are included in many of these regional projects, like maybe on the council's habitat page.

MR. PUGLIESE: Yes, and that's the one thing we've done with any of the distributional maps like that. We usually defer directly to the states most recent mapping. A lot of the regional efforts sometimes try to collapse them and make them compatible between different things, and I think sometimes we lose that resolution at the state level, and so, for us and what we provide as maps that really are defining what EFH distributions are, we use those ones, and so we can -- What the key is, it's just to make sure that they are the most updated in the system, as it exists, so that they can be accessed. The second one is the summarized mapping protocols, and most of that, again, is done internally between the states of North Carolina and Florida, and so is this something -- The

difference here though is it's trying to bring together some of that discussion and actually sponsor a workshop.

MS. DEATON: Well, I know that, in North Carolina, that is totally under discussions right now. There's a high and a low salinity workgroup, two different ones, and they have different natures to them, and criteria, and it's a challenge, and so I don't know if combining data with Florida is realistic, and maybe some low-lying, minimal, standardized metrics would be great, but --

MR. PUGLIESE: Well, then it may be standardization for different habitat areas. I mean, that's very different for North Carolina versus Florida, and I think Rene was going to make a comment on something.

MS. DEATON: Yes. Rene has a comment.

DR. BAUMSTARK: Two things. On the mapping, that first point, yes, I just want to confirm that, in Florida, we do have everything compiled and in a format that could easily be integrated to something this website. Second, there is some precedent for having -- Well, we have a mapping and monitoring practice, led indirectly through GOMA, for Gulf States, and I guess Texas seagrasses are different than Florida seagrasses, and so I think there was a model that would probably follow and do something similar between North Carolina and Florida, or at least use that as a model, a template.

MR. PUGLIESE: It sounds, to me, from all of this, is it's really just a matter of -- They're basically completed, which I think was highlighted in most of what presented in past things, just to maybe make sure that we have an opportunity to touch on those and ensure that the mapping information is the most recent and that there is somewhere that it does identify the mapping activities, protocols, et cetera, and so it's just maybe a presentation and we could have a focus on some of that at one of the AP meetings, or something that provides that information to the overall group, and so it's not necessarily a new priority, but it just is a follow-up from a completed priority.

MS. DEATON: I will say, even though North Carolina does have the maps now, it's been a really heavy lift, because there's no dedicated staff or funding, and so it's always -- It's just harder, because we have to find funding and partners and pull staff when we do monitoring programs to go out and ground-truthing, and so there definitely is room for improvement here, even though we have something.

MR. PUGLIESE: I think it's good, as part of the overall process, to understand some of those types of limitations and the value, once they are done, to make sure that they're integrated in the right places and that they're provided to the right areas.

MS. DEATON: Wilson had his hand up. Go ahead.

DR. LANEY: I just wanted to say that I participated in the North Carolina process, on the low salinity end of things, and, as with the updating of fishing areas, and Anne is well aware, and I'm sure that Rene is too, that the SAV areas change, and they're dynamic, and so I don't know whether we want to try and -- Maybe putting a generic statement in somewhere along the lines of, even though these are completed, they also need to be redone at some desired interval, and, Anne, do you remember what we put in the North Carolina monitoring plan that APNEP just finished?

Aren't we shooting for like a five-year interval to have things re-mapped? I don't remember exactly what it is, off the top of my head, without looking it up, but the point is these are dynamic systems, and they wax, and they wane, and they change, and so, yes, you need to -- Even though they're completed for the moment, they need to be redone on some periodic interval.

Then, also, in North Carolina, and I would look to Rene to say whether the same situation exists in Florida, but the low-salinity SAV species are not nearly as easy to survey and monitor as are the high-salinity species, simply because of water clarity, and so we came up with a separate protocol, even though it's addressed in the same monitoring plan, or wait a minute. It isn't. Is it?

MS. DEATON: No.

DR. LANEY: Right. We're going to do a separate one for the low-salinity stuff, and so we did the high-salinity first, and we picked the low-hanging fruit first, and so, if that's the same situation in Florida, I would be interested in having that presentation, Roger, and maybe, at the fall, we can get Dr. Kenworthy to come in, and/or Dean Carpenter from APNEP, and talk about the monitoring protocols and the workgroups and how they were developed and why there are differences in low salinity versus high salinity, and it may be, and Rene could speak to this, but it may be that, in Florida, you don't have to worry about the low salinity as much, but, on the other hand, you've got those grazing sea cows out there, and I don't know whether they eat low-salinity SAV or whether they prefer turtle grass or what.

The presentation would be useful, and perhaps some additional discussion of whether or not we can develop effective protocols for both low salinity and high salinity, and I'm assuming the answer is yes for high salinity, and maybe the jury is still out for low salinity, and have some further discussion on that and then talk about the return interval for surveys, what should it be, and maybe Trish is going to help jog my memory on that.

MS. DEATON: Yes, and I was going to suggest that -- I mean, Trish being APNEP and on those monitoring groups and helping with the paper about SAV could also provide information to the AP, but go ahead, Trish.

MS. MURPHEY: I was just going to -- Wilson, you're right, and we just got our SAV monitoring plan approved by our leadership council, and I don't have it in front of me, and I was trying to find it and couldn't find it, but I think what our plan is is we have -- We tried to rotate through areas, at least in the high salinity, and I cannot recall what we said about low salinity, but I think we had some sort of maybe a three to five-year rotation of areas, and so I think, every year, we would map a smaller area and rotate through. I think that was the plan, and we were going to go off of like Tier 1 and Tier 2 type sampling, with Tier 1 I think being aerial and Tier 2 would be the ground-truthing stuff, and there may be some discussion of some sentinel sites, and that may be more the low salinity, and so that's just kind of going off the top of my head, without having gone back and looked at the plan. Does that refresh your memory, Wilson?

DR. LANEY: Yes, Trish. I think that covers it pretty well, and, again, if we have a presentation in the fall, we could talk about it some more, and I think the problem was, in North Carolina, just the water clarity and turbidity preclude any sort of aerial survey, any sort of remote-sensing survey, for the low salinity stuff, and so we were having to do that more by longshore transects and

underwater video cameras and ground-truthing, that kind of thing, and it's a lot more labor intensive type of approach, in North Carolina, anyway.

MS. MURPHEY: Yes, and I guess, on top of that, our problem too with the high salinity is you've got to do -- Since we have an overlap of shoal grass and eel grass, we have to kind of time it so that we can catch both, and sometimes we run into -- In the high-salinity areas, we actually run into some visibility problems, but I think we've done a pretty good job so far, I think, with the high salinity.

MS. DEATON: Rene, did you have something to add?

DR. BAUMSTARK: Just, as far as Florida, Wilson, our lower-salinity areas -- I have used those emergent seagrasses as part of the -- We are able to map them, and it's not as easy, of course, and the timing is harder for acquisition for imagery, but we are able to map them, and I had another point to go along with that, but it's slipped from my mind.

You mentioned sharing knowledge on that topic and how we go about mapping and monitoring, and I certainly could line something up, and I know there's some expertise in the fall that could also maybe speak to the possibility of integrating or creating standardizations for cross-walking our efforts.

One last thing is the -- Just to highlight the significance of this all, we do -- On the east coast, we map, periodically, I believe at least every four years, and, a lot of times, it depends on funding for the water management district and their surface water improvement programs, but, right now, in the Indian River Lagoon, as an example, which is a large portion of our east coast, we're still experiencing a massive die-off, or a recurring die-off, and it's affecting our ecosystem. We have an unusual, an ongoing unusual, mortality event for manatees that we believe is probably tied to the lack of seagrasses in that area.

MR. PUGLIESE: Rene, would it be appropriate to go ahead and put that presentation up underneath the one above, basically relative to mapping, and you can get into more detail, but it seems that it fits there.

DR. LANEY: Rene, to follow-up on the manatee die-off thing, for some reason, that caused a little lightbulb to come on in my head, and I will let you know -- You may have already seen it, but there was a recent article in *Science* about bald eagles and other birds that experience avian AVL, avian, whatever the middle word is, lethality, and it turns out that it comes from a cyanobacteria that colonizes hydrilla leaves.

Then the toxins build up, and these things are eaten by coots, which in turn are eaten by the bald eagles, and then it builds up in the eagles, and the eagles die, and so it might be productive to look at that article, and I will try and remember to send it out to everybody, and I know you all have plenty of manatee folks that are looking into the whole thing down there, but I wonder if something similar might be happening to the manatees, with respect to a cyanobacteria that is colonizing hydrilla, because I know you have plenty of hydrilla in Florida.

DR. BAUMSTARK: Yes, certainly. I think the take-home is that entire ecosystem, which is really based on the middle of it being seagrasses, is in shatters.

MS. DEATON: Steve Miller, would you like to add something?

MR. MILLER: I can't speak necessarily on vegetation monitoring over in the Gulf, but I represent the St. Johns River and the water management district here, and we have very extensive and labor-intensive management of SAV going on, and it's been going on for quite a while, and I think we would be able to participate and put together a workshop on what our sampling protocols are and what we've found.

In response to the manatees and low versus high salinity, I think they eat anything that's green. They will eat the grass out of your yard, and it seems to be -- With the die-off, it really seems to be an emaciated condition, and, in the river especially, with hurricanes recently, we have had just massive die-offs of Vallisneria. In fact, we have crews out now planting in some sections of the St. Johns River, and so, anyway, I believe that's it with the manatee, and I tend to think that's what the common perception is, that they simply overran their habitat's ability to support them, in terms of food, but, yes, I think we would be -- I think we would enjoy putting together something to talk about the monitoring we've got going on in the IRL, and even the lower basin.

MS. DEATON: Thank you. That would be great. Does Lor Morris still work there?

MR. MILLER: Lori Morris has an office two doors from mine.

MS. DEATON: Tell her that I said hello.

MR. MILLER: I am going to volunteer her to do this.

MS. DEATON: Okay.

MR. PUGLIESE: Okay. I think that really rounded off or completed -- There's a lot to highlight, I think is what the biggest thing is in there, is to make sure that it's clear about everything that is ongoing that has addressed those, and what's laid out here does a good job to start that, with a focus on the fall AP, or there was even a comment about a workshop, and that's to be discussed, on the value of trying to advance things.

If there's no more on that specific area, it's kind of connected back up to that, because it highlighted the need to have existing information on water quality requirements for SAV within there. My guess is that some of that presentation, review, et cetera, could probably cross over into that, possibly, and so then Action 2 would kind of be encompassed under that discussion, or is that something that we need to just focus on totally separate?

MS. DEATON: You're asking about Action 2 that's right there on --

DR. LANEY: That's another one that we're working on in North Carolina, and Anne and I are both engaged in that, along with Judd Kenworthy and Dr. Hans Paerl. We're currently working on water quality requirements for SAV, and so it could be part of the fall discussion as well, I think.

MS. DEATON: I think it definitely should be, because that is the primary threat to SAV, and so any monitoring for SAV really has to include monitoring of the water quality parameters relevant to SAV.

MR. PUGLIESE: What I did is just added in that, under development by partners, and that we'll integrate an update at the fall AP meeting, and so at least the request to the council is identifying essentially an SAV session. That moves us on into the last one, to investigate potential -- I was going to mention that earlier, just because of the implications -- Regional partners, in cooperation, discussing the implications of climate change.

I think this is probably something that would be good to at least highlight, and it overlapped with the -- Something that was raised before is that overlap, potential overlap, with the climate policy and addressing what the anticipated changes in those habitats may be as some of these different things happen and then the implications that's going to have for managed species. I mean, this connects very well into some of the discussions that we had previously, and I would open it up to members' thoughts on how to address this.

MS. DEATON: I would think you would want to just mention it in both places, because, in the climate change chapter, you would want to say that you look at the effect on SAV as well as other habitats, but, here, it could be really -- It could have -- We really don't know, and it could have a very large impact on SAV, and so I would hate to not mention it specifically under SAV, and so that's my thought. Trish, what do you think?

MS. MURPHEY: I think climate should -- It's going to hit, at least in North Carolina for sure, and it's going to impact SAV, because, as I said earlier, we've got the northernmost range for shoal grass and the southernmost range for eel grass, and I know there's been some work done to predict that, based off of a climate change scenario, eel grass is going to move more north, but what I was going to say that I'm participating -- Anne, are you on this, but I am participating in a -- I'm a stakeholder on a study done by UNCW looking at bedform change from climate change and how it may impact blue crabs and the fishery, and so there's some work being done, at least in changes in North Carolina from climate -- From shoal grass increasing, and eel grass decreasing, and how that's going to impact different species, and this one being blue crab, but just to let you know that I think this is the first year of this work, but it's been interesting so far.

MS. DEATON: Yes, and, actually, I was thinking about how climate change could SAV so much, but maybe that is more relevant to North Carolina than south Florida, unless it exceeds temperature thresholds there. Paula, would you like to add something?

MS. KEENER: This is not my area of expertise, but I just am wondering about clarification of terminology here, because it's not clear to me whether we're talking about the SAV itself, or are we talking about the community, as is written in Action 3, or are we talking about the SAV habitat, or are we talking about the SAV ecosystem, and so what exactly is being addressed here, and I'm just asking that we be clear. Thanks.

MR. PUGLIESE: I would say that the intent of this is to address the entire SAV habitat, the species, the system, and how it supports all the species that are utilizing it, and so it's the broadest -- In that aspect, I think it's the broadest sense, and that's the definition that it's being used, I think overall. Anne.

MS. DEATON: Yes, I think that's right, and I believe first comes how is the SAV, the plants themselves, changing in distribution and composition and density, and then that will affect the communities, the invertebrates and the fish, but you would need monitoring. You would need some monitoring to confirm that, and so I'm trying to think if "community" is the right word. "Habitat" is not, and I like "system", the SAV system, or "ecosystem", but I think that's what links it to fisheries species and the council, is by looking at how the change in the plants is going to affect the fish and invertebrates.

MS. KEENER: Well, I mean, what I'm thinking about is how you -- What is it that you're -- I get it, and it's the bigger picture that we're looking at, but you can't just monitor the vegetation and uncouple the monitoring of the species from it, and so that's what I'm struggling with here.

MS. DEATON: By species, you mean the fish species, right?

MS. KEENER: Yes, and they could migrate, in response to climate change, whereas the vegetation may not and be affected by the climate change.

MS. DEATON: SAV is known for being used by -- Like the highest diversity of animals utilize SAV, and so, if some species were to shift, there would still be others, maybe, that would come into the area, and then, also, we often use the habitat is a surrogate for supporting the fish, because there have been so many past studies that show species X, Y, and Z use this type of habitat in this condition, and so it's at a point where you can assume that, if the habitat is there, then the animals that utilize it are there. That's me being more practical, but you still need some monitoring.

MR. PUGLIESE: That's a real critical point, Anne, you're making, because I think that's one of the biggest differences from the way the council has designated EFH to other regions, where the distributions of habitats are backfilled by the species utilization of those habitats, but the designations are the distributions, because of just for the reason you said.

MS. DEATON: I mean, it's like saying that, just because a black sea bass isn't on an area of coral at one year, that it's not EFH habitat -- That that coral isn't EFH habitat for black sea bass, and it's because those fish do move, and they're harder to -- They're not all present all the time at every piece of habitat, and that's why it's just easier to monitor, I guess, the habitat as a surrogate of whether the fish have what they need, if that makes sense. Wilson has his hand up. He might be able to explain that.

DR. LANEY: Well, maybe. Generally, I agree with you. I mean, the assumption we make is that, if we can map the habitat, then, generally speaking, we would expect to find the associated community present, but I think we all recognize that's not necessarily the case. We can easily cover map terrestrial ecosystems, and we can presume all sorts of things about what creatures may be available, or present, in that habitat, but it certainly has to do with the quality of the habitat, as to whether or not area-sensitive neotropical migratory birds are present to any degree whatsoever, and so the same thing is kind of true with respect to SAV, and that is exactly why we are working to, I think in part at least, develop those nutrient and other water quality standards for SAV in North Carolina, to try and keep the matrix, if you will, in which SAV grows optimal, so that it will be colonized by all of those other species that we so much value for fishery purposes. I mean, is that where you were going, Anne?

I agree, certainly, with Paula that it's all problematic, because the hits the agencies have taken in terms of staff and resources to do the fishery-independent kind of monitoring that they need to do, and it's important to map the habitat, and I think that really still needs to be Priority 1. You've got to map it, and you've got to know where it is, but you also need to know how healthy it is, and that's where the monitoring of the entire community, to me, comes into play, and I think that was the point that Paula was trying to make, in terms of us needing to be specific here about exactly what we're talking about.

It is kind of a hierarchy, in that the plants themselves have to have a healthy environment to establish the SAV bed, which is large enough and visible enough for us to map, and then we have to have some sort of supplemental sampling program to look at what's actually in there and using the community. It's complicated. Nothing is ever simple.

MS. DEATON: I agree with that. That's right, and that's monitoring too, the habitat monitoring, is for. Mapping, really, of the habitat, that's a first step. Then you also have to monitor their condition, which we can get by looking at the species and their density and their persistence and where they are located, in terms like depth and water quality conditions. Then you can look at the community that is present within it, the community of organisms. I guess, in answer to Paula's question, you do want to leave that as communities and not just the plants.

MR. PUGLIESE: Should this be identified as a priority, because of all the implications for what may be coming down the line? You have highlighted a lot that may be able to be addressed, either in the policy review or in subsequent work by the AP or partners, and so is this a priority to address at this time, considering it is an EFH HAPC, or EFH, depending on the species, and the change in that distribution and implications into the future? The question is, is it something that we can begin to document and highlight in 2021 and 2022?

MS. DEATON: Trish.

MS. MURPHEY: This might be getting at Paula's concern too, because I didn't catch this until just now, but, under your policy component addressed in Actions 2 through 3, monitoring and research, periodic mapping, and monitoring, and you go along, and it's really more about the SAV and the water quality, and there is really no mention of your fauna in there, and I wonder -- Do we need to mention something about the fauna in that, to better reflect Action 3, if we are talking about SAV communities as a whole? I think there's a disconnect there.

MS. DEATON: Yes. It's not consistent, and so do we want to add fauna in the paragraph above, or leave it and take out communities below? I think we were leaning towards including the comprehensive monitoring.

MR. PUGLIESE: This is some wording out of at least probably the original document, and so what you can do is add or refine that. Under the discussion we had on the policy that was trying to weave everything together, distribution quality, plant systems, and reliance and use by fish and invertebrates, and so that's kind of the bigger picture of all the things woven together.

MS. DEATON: You've got it there.

MR. PUGLIESE: I think if you look at the overall actual policy, it's very clear that it's connecting everything, and this is kind of a focus on the specific action, but this, I think, potentially helps clarify that the intent is that you're looking at the broader thing, especially when it comes to the implications of change and what that may mean for not only its distribution, but how that affects the species that are using it.

MS. DEATON: Yes, I like that. Paula.

MS. KEENER: Trish, thanks for bringing that up. Again, the consistency throughout, and even in that policy component addressed in Action 2.3, it reads as if it's just SAV, water quality criteria needed to support SAV survival and growth, and so, yes, just the consistency throughout. Then, again, this is not my area of expertise, but the SAV serves as nursery areas, correct?

MS. DEATON: Yes.

MS. KEENER: So then, yes, it should be a priority, going back to the question that I think Roger asked, if this should be a priority, right, and didn't you ask that about ten minutes ago, Roger?

MR. PUGLIESE: I think we're kind of walking the line of what the priority means, in this case, and I think you're highlighting the implications for understanding what some of the impacts of climate change may be, and also getting into how some of these evaluations may be coming down the line, and how that might help us understand what habitat impacts are going to be affecting our discussions on climate scenarios and species and management, et cetera, and so it may not be fully developed in the next few years, but I think it warrants putting it into the priority, so that all of these things begin to happen.

MS. KEENER: Okay. Thank you.

MR. PUGLIESE: I think that's a good dive into there. When you get to the next stage, that this has been identified as one of the top three for potentially updating, to not only address climate, but then to address all the either components of actions or follow-ups from activities that are going on, a lot more can be done in that process, and so I think this does a good job of kind of tying it back to the original roadmap action areas, and it highlights those.

What we've done is gone through the top three areas, the top three, the dredge policy, SAV, and energy, to get the details, and so let's see what time -- We're getting deep into here, and what we could do is quickly go through the other areas, just to highlight maybe some of the actions that would be anticipated to be addressed in the short term, and maybe identify other areas, and maybe just stay in the sequence, because the way I look at it is what comes into the middle area was going to end up being the climate, aquaculture, and ecosystem, and then the bottom tier would be the invasives, flow, and artificial reefs.

MS. DEATON: Yes, that's what I have, too.

MR. PUGLIESE: Okay. Which one do you want to start with between those three, for the center areas? Climate was one of these.

MS. DEATON: That's fine.

MR. PUGLIESE: Because I think it's fairly limited, in terms of the initial actions. Okay, let's jump in here. Develop and engage in a cooperative process, and, again, this is because it's tied directly to some ongoing things, and I think that's going to be really important, but a cooperative process between the councils and ASMFC. The Caribbean is not involved, and this is an Atlantic coast and ASMFC effort on scenario planning that is underway to look at adaptive management and how to deal with shifting species, and so that, I think, is a priority for -- I'm just going to put that as a priority, and everything is draft right now, and so this is a priority that builds on the existing.

The other activity is that there's going to be close coordination between NOAA Fisheries Northeast Region and Southeast Region, with the Science Centers and what activities they're doing, to make sure that the research, as well as the fishery-independent surveys and other surveys are compatible between the north and the south areas, so that, as these species shift, they are monitored and tracked and able to understand what the implications of climate and how that affects both the science as well as the management between all the different entities. That, I think, ends up being a candidate for priority, because that is something that essentially is underway right now. We'll get into more detail of a lot of those types of activities as they evolve.

Action 2 is develop or select previously-developed climate indicators, and this is one of the things that I think I highlighted before, about it's really outside the bounds of what we're working on, and these are some of the areas that are being developed through the climate vulnerability analysis or in cooperation with some of the other partners, and there's some other indicators being developed through some of the other regional efforts, and so this one of the ones that I would say that really does also -- Especially when it talks about management triggers, and those are some of the different types of things that are going to be developed on the backend of some of say the climate scenario planning and on what would highlight and provide the opportunity for councils, or commissions, to take action. We don't have control as much about that, but I think it's tied to the first one, but it really is in control of NOAA and other regional partners.

MS. DEATON: Since NOAA just reported on the climate vulnerability assessment, and they have indicators within that, wouldn't those be the indicators that this is referring to? Wouldn't you say that then the indicator part of that is completed, but the triggers for management action has not been done.

MR. PUGLIESE: Yes, and I think that's accurate. I guess the only reason that I didn't put completed is that we have not seen the actual compilation of this, and this has not been presented to the council, and it has not been brought forward as a reaction for how to use this, and it's at that point now, and so you're right, and I think that's the way to do it, is that there are ones that are completed and then we can do it through NOAA, specifically, because there may be other ones that are being looked at, through say Rua and others in those regional areas that have some other different types of maybe compatible or connected or expanded indicators that may be useful too, but management --

MS. DEATON: But we work most closely with NOAA, and NOAA/NMFS is tied to the council.

MR. PUGLIESE: Yes, and the council would have to be able to rely on that.

MS. DEATON: Yes. Paula, go ahead.

MS. KEENER: This is getting to be a long day, and so bear with me on this, please. Yesterday, we made a couple of other recommendations that a Southeastern version of -- It was either the CVA or the ESR be developed, and was it the CVA?

MR. PUGLIESE: When you're referencing a south version, what it was, it was the habitat -- Cindy may weigh-in on that one, but it was to do a habitat-based assessment, versus a species climate vulnerability, because the climate vulnerability assessment is species-based at this time, and other regions have actually done a habitat-based vulnerability assessment.

MS. COOKSEY: Yes, it was the habitat based.

MS. KEENER: Okay. Thank you.

MS. DEATON: Well, that's a really good point, that we should probably have something in there specifically about wanting a habitat CVA for the South Atlantic. Wilson, go ahead.

DR. LANEY: To your point, Anne, about the indicators being finished, and I would defer to Steve on this, because he sits on the scoring workgroup with me for the species climate vulnerability analysis, but those were -- They are indicators, and they were indicators of vulnerability though, and we use them in assessing whether we thought, based on best professional judgment and on the literature that Michael Burton had reviewed and provided to us in the species profile, how vulnerable those species might be under a climate change scenario, and I don't know.

Again, I will defer to Steve, but I'm thinking that indicators would be whether or not -- For example, let me give you a real example, and then maybe Steve can chime in here, but one of our metrics that we considered was how highly mobile a species was, and, obviously, a very immobile species, a sedentary species, would be far more subject to the potential for climate change impact than one that was highly mobile, but, to me, the indicator of whether it actually happened or not is not the mobility itself, but rather whether we see a pronounced shift in distribution by that species, and so we can have a species, and we can say, well, we think it's highly vulnerable, but, if it doesn't move, then maybe it was a lot more tolerant of increasing temperatures than we thought it was.

I think that -- I am not so sure that we have completed looking at potential indicators, and we looked at a bunch of metrics that helped us assess the vulnerability, but I'm not sure that's the same thing, but I would be certainly willing to discuss it more, and I think it would benefit from some more discussion.

MS. DEATON: Okay. Point taken. So I guess we're going to leave Action 2, and you may want to change, Roger -- Maybe hold off on saying that the indicators are completed, unless -- I don't know if Steve Poland is on, but if he has other thoughts.

DR. LANEY: I will just say, Anne, that it may be that somebody has already compiled a good list and it's out there in the literature, but I think that the ones we used for the CVA were not quite the same thing, but, again, if Steve is on, he can jump in there.

MR. PUGLIESE: I have clarified that, because that's kind of the reason that I didn't have completed in there, because of that actually not being all the way out, and I think, more importantly, is some of the focus that we've talked about, is this has been -- The indicators developed there were specific to the species, and the question is what -- In the ecosystem status report, are there what you would consider climate indicators, but, again, we need to have these fully developed, and so I think keeping it in the system, in kind of the frame it is right now, is probably good.

DR. LANEY: One other person that I forgot is Lauren Gentry is also on the CVA working group, and Lauren is still on the call, or at least her name is still showing, but, to me, the indicator is does a species shift -- The real climate change indicator is did the species shift its distribution, did its spawning window get truncated, did it flat out disappear from the southern part of its range and increase tremendously in the northern part of its range? To me, those are the -- What those are is the manifestation of the parameters that we use to assess climate vulnerability, to further clarify that.

MS. DEATON: All right. Do you want to move down to 3?

MR. PUGLIESE: Yes. Number 3 is the council, in cooperation with NOAA, discuss and consider action to include climate impacts in the ABC Control Rule. Now this -- Again, since the CVA has not been finalized, the ecosystem status report, none of this has actually been embedded by the SSC, and this is something that will have to be developed in the future, as those types of information are developed by NOAA, so that that could actually be provided and revised, and the SSC would have to weigh-in on the ability to use this type of information, and the council would subsequently have to respond to that in future amendments or some type of a comprehensive amendment relative to the ABC, the allowable catch, Control Rule.

I think this would be underway, and it talks about the possibility of doing a best practices workshop, and these are things that are somewhat out of our council's control, necessarily, and it's going to be coming from our coordination with national and how they implement the climate mandates and to what degree the Southeast Fisheries Science Center, through the Southeast Regional Office, provide additional guidance on being able to utilize information.

It does talk about the possibility of bringing in regional experts on climate, for say a possible workshop, but I think that would also be something that would be tied directly to like a national SSC workshop on how to address climate in stock assessments, and I think some of the previous ones may have touched on that, but I have a feeling that you're going to see some focus on that in the not too distant future, coming from a national perspective on guidance on how to apply and utilize information in things such as development of the control rule.

MS. DEATON: Roger, before we discuss that, could somebody -- I am getting feedback, and maybe somebody doesn't have their mic muted, and sometimes that will happen.

MR. PUGLIESE: Yes, and I don't see anybody over here that has their mic on. I think it went away.

MS. DEATON: Of course. All right.

MR. PUGLIESE: Okay. Back to it, that is one that is, again, somewhat outside the scope of at least how this group, or the council itself, I think is going to have to rely on NOAA to provide that information, so that that can actually advance. We may get some ability to see that, as they invest more into applying the climate actions and the implementation, and they have regional action plans that are supposed to be addressed, but this, I think, actually, is probably going to be something that gets more tied directly to a national perspective, and so that's as far as I think we can go with -- That's really more our partners, or NOAA, in general, the higher level.

That takes care of all the high and the first medium, with climate, and I think the key on the climate is that that's going to crosswalk with essentially every one of the other policies, because of some of the significant actions that are highlighted in there.

I guess, to continue down, marine aquaculture was identified as in the middle range, with the other activities, and Action 1 is develop a non-fishing research priorities document addressing proper siting relative to marine aquaculture. I think this is something that might be worthwhile identifying, even though it's not something we're buried in right now, and we may have the opportunity to draw on the information that's being developed through the CCC Habitat Workgroup or how they're going to pull it together for -- They are addressing the action areas in the Northeast and in -- This is a national workgroup, and so it's both in the Gulf of Mexico, the Northeast, and the Pacific, I think, have all opportunity areas, I guess they are, for the aquaculture.

If they develop something like that that provides some guidance on advancing that, it would be good to integrate in, or build on that, to start the stage of -- Maybe toward the end of that timeframe, advancing that policy through.

One of the reasons I think this is an opportunity, or a connected issue, and this is how it originally came out, is, when we had the discussions at the larger workgroup, the discussions on structure, impacts of offshore structures, and so it was being put in that context, and a lot that's going to be discussed for -- At least various aspects of it are going to be discussed for wind and for development of other offshore structures, and they have some of the same types of implications, and I think there's an intent to try to build on that and advance that and use that, and, if that's appropriate, that may be something useful that the panel can draw on.

MS. DEATON: Chip Collier would like to say something. Go ahead, Chip.

DR. COLLIER: Thank you, Anne. I did want to point out that NOAA has developed some of these aquaculture siting permits, and I think it's James Morris and his group that have been working on this for a few years now, and I know they were starting with the Gulf of Mexico and southern California, and so they might be to other areas, and I think Ken Riley is involved with this as well, and so there's a few people in the South Atlantic region that have been involved in this initiative, and it might be good to reach out to them.

MS. DEATON: Yes, and they do the aquaculture -- They've done several siting tools nationwide, and I know that, in North Carolina, they did like a pilot study of a siting tool for us, inside, in estuarine waters, in Bogue Sound, and so it's a good idea to reach out to them.

MR. PUGLIESE: Thanks, Chip. That's important, and I think that's kind of -- Especially location areas. Some of the other ones were specific, because there were areas -- Jim may have had specific

input on say the Gulf ones that are moving forward too, and so, yes, that's an excellent recommendation.

MS. DEATON: Go ahead, Wilson.

DR. LANEY: Well, this one has more to do with Action 2, I think, in terms of identifying data gaps related to siting and species interactions with aquaculture facilities and all, and Lisa may want to weigh-in here, and I know NMFS has given funding, I think, to ASMFC, with regard to aquaculture, and I know that Louis Daniel is the point of contact on that, and so just a reminder that we should -- We might benefit from talking to ASMFC about what sort of things they are funding and doing with the funds that they receive from the National Marine Fisheries Service.

MS. DEATON: Lisa, did you want to say something?

DR. HAVEL: Just quickly, and Wilson is right, and Pat Canfield, the Science Director at ASMFC, is -- I don't know he's co-in-charge with Louis, but he's definitely involved in the grant for aquaculture, and so he might be a good point of contact as well.

MS. DEATON: Great. Thanks. Trish.

MS. MURPHEY: I didn't know if this would fit here or not, but I had just seen NOAA Fisheries Habitat's little newsletter, and it talks about how much a clam is worth in a coastal community, and, basically, it was a study that estimated oyster and clam aquaculture provided $2.8 to $5.8 million in services that remove excess nitrogen from the coastal waters of -- This is a small thing, but I guess my point was I wonder -- Is this a place to talk about getting more information, as far as site -- On top of siting, those other ecosystem services that aquaculture may provide to benefit other species, or, in this case, I was thinking of SAV. If you remove nitrogen, you have removed algal blooms and chlorophyll-A, and it makes the water clear, and it's better for grass, and so I didn't know if this might be a place for that to fit, for that type of research.

MS. DEATON: So ecosystem service benefits from aquaculture.

MS. MURPHEY: Yes, and would that even fit here? Again, this was just some little blip that I read in a NOAA Habitat email, and I guess it was a small study in one area, but, in removing that excess nitrogen, it performed a big ecosystem service, and we're worrying about eutrophication and everything and how that impacts SAV, and I guess I'm thinking the species interactions, as far as like SAV, and is that -- Does that fit here?

MS. DEATON: I think there can be -- I do, and it could be, actually pros and cons, right? They do provide a benefit. Well, that would be particular to shellfish, because of the filtration, which, in the Southeast, is mostly in the estuaries, but then there can be cons. For example, if the cages are put on top of seagrass.

MS. MURPHEY: On top of SAV, yes.

MS. DEATON: Yes, but, if properly sited, near it, it could improve water quality for shellfish.

MS. MURPHEY: I guess that's what I was getting at. If you site it appropriately, you may be killing a few more birds with one stone, if you're trying to improve SAV and also have aquaculture, and so I know there are pros and cons to that, but I'm just throwing that out there as an idea.

MS. DEATON: But, in the federal waters, most of it is the finfish aquaculture, which doesn't have the nutrient benefit, and it does the opposite.

MS. MURPHEY: So are we talking about just -- Are we talking about only in federal waters, or are we talking -- I guess, when I think about aquaculture, I still think of shellfish, but that's just me. I can see this going beyond just inside shellfish, but I guess maybe that's my first question, is onshore or nearshore -- Okay. Never mind. I guess what I said doesn't probably count.

MR. PUGLIESE: I think the intent is that it's aquaculture in all marine waters.

MS. MURPHEY: Okay. Anyway, I'm just throwing that out there. Thank you.

MS. DEATON: Somebody could do sea scallops in ocean aquaculture.

MR. PUGLIESE: Did you want me to either put in from appropriately sited or from positive or negative benefits or something, or just leave it the way it is?

MS. DEATON: That's good, and I think there is information in the policy about that, to some extent, but --

MR. PUGLIESE: I guess the key is there's a lot more detail in other places, and these were some very specific points, or action items, that were identified to try to advance, and so, yes, there's definitely a lot more detail, in terms of connections and interactions and impacts, et cetera. This provides an opportunity to highlight and refine and clarify that as that gets addressed in the future.

MS. DEATON: Okay. Wilson.

DR. LANEY: I agree with Trish and you that ecosystem services, both benefits and impacts, would be appropriate in this section, and I think we all just need to keep in mind that, in a lot of cases, those impacts or benefits are temporary, because the whole intent is to grow an organism that can be harvested then for consumption, and so just keep in mind that they are temporary and Roger, I think, already answered my other question, which is whether we're talking mostly about aquaculture within the jurisdiction of the council, which would push it to three to 200 miles offshore, but I think, as a Habitat AP, we also have to be cognizant of what sort of aquaculture operations are occurring inshore as well, and especially in estuarine nursery areas, because those do potentially have impacts, or benefits, to council-managed species, as well as ASMFC-managed species.

MR. PUGLIESE: Yes, and I think you just walked through the entire thought process. Originally, there was a desire that maybe this should be just focused, and, once you really realize the EFH mandates and utilization, to cover the whole thing, you really needed to keep it that way.

DR. LANEY: I will just point out, and Lisa can chime in, that ASMFC did do an aquaculture guidance document that would give us a heads-up on, I think, discussing ecosystem benefits.

MS. DEATON: Go ahead, Lisa.

DR. HAVEL: Wilson is right. That aquaculture document was the bane of the Habitat Committee's existence for seven years, but it is published and available, and I will send a link to it to Roger in an email.

MR. PUGLIESE: Thank you, Lisa, and, yes, we kept on going back and forth on whether we were going to do the presentation to the committee, and you had your job ahead of you to get that done, and so I appreciate it, and it was good, because it was highlighted in kind of the broader aspect of this, but I think highlighting that here is important.

I think we're going to need to move on to the third one under this medium, and that would be food webs. That moves us directly into Action 1, and there are areas under here, and a lot of the focus was a real desire to advance information on forage and prey species information and identify species, and I walked through those core ones, and identify species for which data is lacking. The Ecopath with Ecosim model is the most comprehensive compilation of diet information for not only managed species, but we have 140 different groups, and so all the species that encompass those groups, where available information was -- That's where the diet matrix was built, and so that's one of the most comprehensive diet matrices made.

With regard to managed species, it was looked at very closely, and there's some primers there that provided some focus, and those areas have been identified and provided to the fishery-independent surveys, to collect those, and opportunities for other avenues to collect those, states as well as -- It will come further as the model is further developed, and then some of these documents can be circulated and identified and included, a baseline into the newest SEAMAP five-year plan to identify some of the priorities, and so they are being moved forward, and so it shows as completed.

Define and prioritize major forage groups in managed species diet composition, again, the information is embedded in the diet matrix, and some of this just needs to be teased out to show the specific actions. Some of this is going to be highlighted in actually the application this year of the first application of the actual functional Ecopath with Ecosim model, and so there is importance.

Some of the other things that ultimately may be able to be generated in future iterations that go into Ecospace, et cetera, would be species occurrence and distribution of biomasses. Some of those are still being -- Those are probably very preliminary for what's in the model, and it does not exist, because Ecospace does not exist. In the existing online systems, we do have distributions of some habitats, some species, but not to the level of forage species, and so that one is still one that needs to be developed and advanced to understand the distribution of those species in the areas.

Some of the work done through looking at shifting species, through the work with Rutgers, highlighted species that were identified primarily in the SEAMAP trawl survey, and so there's a lot of nearshore, non-managed species, or what would be considered lower-trophic-level forage groups, and the opportunity to begin to compile those, or pull those out, I think is there, and so that's something that can happen as we move forward, and then, if they do the same work, and others, offshore, are more focused on some of the council-managed species, then that would be

coupled with this. That really takes care of Action 1. Integration of this information to the plans and amendments is going to happen as it's developed, and so more detailed descriptions of forage information is going to have to be pulled together as time goes forward.

I put that in as completed, and that is the life history information, and the beginnings of some of that is coming from the baseline information that is, again, compiled in the -- Used or drawn on for the Ecopath with Ecosim, and then some of it exists in the existing online Ecospecies system, because a lot of species that were integrated early on were lower-trophic-level species or species that came out of the former Florida database, and so there are some, and we just need to line up with what is being identified as the priority species under say the Ecopath with Ecosim model diet matrix with maybe some of that specific information that's being presented in that, as well as other areas, and so those are areas that could be addressed in the near future, if need be.

Under Action 2, develop food web indicators, again, I'm not sure exactly how far you would consider some of the material being developed under the developing ecosystem status report, but, again, that's something that's being developed by partners, and so I think that's something to highlight, that that would be developed through NOAA or through other partners, to be able to get the actual indicators, and the other one is a more recent discussion we've had on what is coming through say the conservation blueprint, the regional blueprints, that are under development that are looking at other types of indicators that may couple some, and we may get to that, and so I think, in total, those are all ones that I think we can acknowledge are being under development by partners. I think Wilson --

DR. LANEY: Roger, isn't a key piece of this one the diet matrix that Lauren has assembled for the EwE model? I mean, you can't look at food web dynamics, or indicators, if you don't know what things are eating, and Lauren has pulled together that whole database, and it is continually being updated, as far as I know, and so I think that's a key piece of Action 2.

MR. PUGLIESE: Okay. I think we actually did highlight this early on, but I think the key is that some of these things -- Well, that's there, and there needs to be more that advances that, so that you can begin to take the connections to what you would consider indicators, and I think there were some things that are going to be evaluated as they continue to develop the model that were some kind of -- The valuation capabilities they did for some of the Gulf, I think Gulf models, and that may be what gets developed later this year, and that maybe leans closer toward understanding some of the overall connectivity, but, again, does it lead to indicators, food web indicators, and that's to be determined, I think. Any other thoughts on that area?

If not, we can move on, and Action 3 has to do with develop ecosystem indicators, looking at what the characteristics are of key managed and prey species, environmental drivers, and mechanisms. I think the ecosystem status report is beginning to advance that discussion, but, again, it is started, and so you could consider that, again, being developed by NOAA partners, or by partners, including NOAA.

MS. DEATON: Wilson.

DR. LANEY: I agree, Roger, and I think some of the recommendations that we have made for additional things that they need to either include in the research recommendations, or actually try and incorporate in this initial one, things like fish kills and the extent of hypoxic or anoxic zones,

are just really, really key ecosystem indicators, and I am remembering a conversation that took place, and Mel can maybe help jog my memory here, that took place some years back, during one of the council meetings, where, and I think it was Mel, and hopefully I am not wrongly attributing it to him, but he pointed out that, if we looked at a lot of the indicators that existed at that time, that we would conclude that things were not in such hot shape within the South Atlantic ecosystem, and I can't remember, with a high degree of specificity, what indicators he was looking at.

I know one of them was cold-water upwellings, I think, Mel. If I remember, you mentioned that, and so, again, I think it's important, as the ESR evolves, and I am greatly looking forward to hopefully the Southeast Fisheries Science Center will be able to update it on a regular basis, and I think, hopefully, more and more useful indicators would be added to it, so that we really have a good picture of what's actually going on in the South Atlantic ecosystem.

MR. PUGLIESE: I think that's -- I mean, we're finally at the point where some of these things are actually potentially going to be there. On the timing, as I think was stated, the ESRs are supposed to be annual, or, in some of the areas, have been annual for years to the councils, and so there's a little humming and hawing on soon it will be done. I assumed that was supposed to be an annual process, and that's maybe something that needs to be clarified, or reemphasized, because, without it being that way, it doesn't provide any baseline.

Some of the other regions get full ecosystem status reports, in addition to the -- They get state of the climate systems, and they're a lot more extensive than what the ecosystem reports are, and so hopefully we can see this evolve.

One thing that I did add in here was the SECAS and the conservation blueprint, really the connection back with the LCC origins, to build a state of the Southeast ecosystem, and Rua was getting into some of the indicators they use for state of the system, and so there's probably an additional opportunity to figure out how some of those crosswalk, and I think those may also have been integrated, or addressed, in the ESR itself, or at least some of the areas that were pulled for that, but it was related to that, and so I think it was important. Again, another partner working on the initiative.

That brings us to down Action 4, characterize seasonal patterns of managed species and looking at north/south movement, and I think this is where the work that's going to be done through both the climate -- That has been done in a climate suitability assessment and to support the climate scenario planning effort may really advance some of the needs to provide this information to actually have different situations and scenarios that can be looked at.

That scenario planning is not necessarily a fully data-driven system. However, understanding just even some of the baselines, and I think one of the first things we're going to see that -- I mentioned that, originally, I was going to try to have it presented to the AP, and it was decided that it may be better to be done at a new activity that our council is involved in with monthly seminars in between council meetings, and one is anticipated to be on the characterizing the shifts in red porgy habitat, through utilization of fishery-independent surveys, through the work of Tracey Smart and South Carolina DNR and other partners there, and so that's getting specifically to this, looking at patterns based on what is anticipated with some of the climate change. Again, this is one of the ones that is a crossover, or crosswalk, with the climate policy, and, essentially, what it ends up being is a priority for both.

MS. DEATON: I think there's one more down below, the last one.

MR. PUGLIESE: The last one is the compile time series and/or spatial maps of temperature, chlorophyll, and some of those -- The South Atlantic Ecopath/Ecosim model applied some core parameters to build time series into it, to at least be the baseline, and it was anticipated that it would be fully fleshed out for full development and developed when the Ecospace component of the South Atlantic model is accomplished.

Now, the way the work is being done this year, there's some specific workshops to address applications of the South Atlantic EwE. However, the Ecospace is not being advanced in 2021, and so the earliest that this would happen would be 2022, but I think the ability to look at some of these times series of change are going to come from a lot of other places, and, again, this is from NOAA partners and from other regional partners, because I think they're going to be integrated for say understanding the climate -- Some of the national analysis that may be done using the same types of information that could be provided to regions are going to be using some of the same baseline information.

Some of those efforts may actually provide some of these different changing activities, or areas, and even say the conservation blueprints that are still under development and refinement that Rua was getting into had begun to start to look at some of the changes in temperature, et cetera, in those areas, and different things too, and so I think there's a number of avenues. The EwE started it, and other partners, but, again, this is going to be something that we may be able to draw on and connect in with other partners, such as SECAS, the conservation, and, where a lot of this information, especially on the environmental information, is coming from the Southeast Coastal Ocean Observing Regional Association and other NOAA partners, as the ocean monitoring capability and the ability to provide that.

MS. DEATON: So do you think you've gotten what you need today, Roger?

MR. PUGLIESE: I think we're pretty much there. The bottom tier ones only had a couple of different ones that I think are obvious on what has been done, and I think going beyond this for 2021 and 2022 is probably a lot. What I will do is look to see if there may be one under each one of those that may be things that are immediately able to be accomplished during the timeframe and get a draft of this out to the overall AP, and we could have at least a touch on this, but I think we got the priority of what the bulk of the documents, as well as the key actions and inputs that are needed into the future and providing the council some recommendations on addressing their mandates and priorities, and so, yes, I think this is the lion's share of what we need.

I appreciate everybody going as long as they did, and I think what would be beneficial, so it doesn't have to go there, is if we could move from this into the one presentation, at least, and Tina Udouj was going to do the presentation on the web services, if you all were willing to hang it, and I think it's important. A lot of what we've touched on here has -- It highlights different things that have been used in the past or are accessible or have been integrated into different efforts supporting this or the repositories of a lot of the information, like SAV and other distributional information highlighted here. Anne.

MS. DEATON: Well, I can. If everybody else wants to just stand up and stretch, and I don't want to do injustice to this last presentation, and so, if you want to go ahead, that's your call, Roger and Tina.

MR. STAPLES: I've got to go. I've got to go get daycare, and so you all be good.

MS. DEATON: All right. Thank you, Shane.

MR. PUGLIESE: Thank you. Tina, did you want to go ahead and go now or -- I hate to push this down into tomorrow, and I can wait on the website, because that's really kind of a broader scope that I was going to touch on.

MS. UDOUJ: I could do it, and I can talk quickly and just go through it fast and do a little demonstration, and it hopefully wouldn't take very long, but I know that you guys have had a long day and heard a lot, and, if you need to leave and do it tomorrow, that would be okay. I would prefer to give it earlier than later.

MR. PUGLIESE: I mean, the option is going now, and there are a lot of people that -- We've gone pretty long and did a lot today. We could either just get it through and then maybe have another session for just overall discussion by the AP at a different time tomorrow, or what we could do is do it after the one that's fixed. We have the opportunity to go say after the energy presentation, because I know Brian has to present like at the crack of dawn, first thing, and so that's your option. What's your preference, Tina?

MS. UDOUJ: I really don't mind doing it tomorrow morning, or I could just do it now. Either way.

MR. PUGLIESE: Anne and members, anybody weigh-in on -- I hate not to get through some of these, but I also don't want to drag it on so long that everybody is burnt out, plus not adequately cover the item.

MS. DEATON: Well, I say we just do it, unless there are a lot of people that have to get off right now, and so raise your hand if you have to get off. If not, we'll just do it.

MR. PUGLIESE: I think it's worth going ahead. I think the presentation is focused enough to do that, and then, like I said, we can have follow-up on this, and the importance of this is to highlight that members talk about their use or access to it and the importance of what they may have used this for or know of others that use the areas, or based on things that we were just discussing, about the possible integration of different things. With that, let me go ahead and -- Tina, do you want to just run it from yours, and I will make you a presenter?

MS. UDOUJ: Yes.

MR. PUGLIESE: Okay.

MS. UDOUJ: I'm Tina Udouj, and I work for the Florida Fish and Wildlife Conservation Commission, and I have presented to this group several times, and so probably most of you are

familiar with the project, but, for those of you who are not, I just have a brief overview of the digital dashboard and web services that we've developed.

We have worked with the South Atlantic Council to compile, create, and host spatial and non-spatial data relevant to essential habitats, management zones, and fisheries in the South Atlantic ecosystem. We're using ArcGIS Server and ArcGIS Online to provide GIS data through the web. Non-spatial data, such as videos, images, and documents are served through a FWC web server.

Real quickly, this is just kind of the architecture that our system is using. We have the data service that has the shapefiles and imagery and databases that we access. Our GIS Server is here, behind the firewall, and we -- The digital dashboard is on our web server here as well, and then all this information is pushed out to different clients.

There is a variety of ways that users can access the GIS data. We have the data catalog, where people can directly download shapefiles and metadata to view the GIS data from their own desktops and environments, and the map services, which can include a lot of different products, and the web apps and Story Maps are ArcGIS Online from FWC, but in the cloud. As I mentioned before, we have the non-spatial included too, and we have videos and images of bottom habitats of the managed areas or scientific cruises. The PDFs include recent documents, diet logs and different presentations, and there's a whole mix of PDF documents that we have on our server. Then the metadata files that accompany the GIS data.

Quickly, I will go over the dashboard, web apps and maps that we've created, and I will show a few web metrics on how the digital dashboard gets used, and then I will finish up with a new product that we've been working on called the Hub.

With the digital dashboard, we have designed it to serve as a one-stop shop for all the GIS data that we've compiled, and the launch page has links to the web mapping applications, and we have our partners page, where we can really highlight a lot of the connections that the South Atlantic Council has made throughout the years, and then we also have a partners page that identifies everyone that they have worked with.

The data catalog looks like this, and this is where I mentioned that you can access the GIS data directly. The map services page provides just sort of a brief description of what the map services contains, and then, if you click on an image, you get taken to the REST endpoint, which is very useful to note, and it can be used in a lot of different ways, and I will highlight this as we continue the presentation, but you can get a little bit of metadata about what the service is all about and all the data layers that are contained in it.

These are the core map services that were developed. Essential fish habitat, the fisheries map service displays data from the SEAMAP South Atlantic, and so there's four different surveys that we have data for, and that's updated annually. We have our managed areas that has all the regulatory boundaries and some federal boundaries that aren't the South Atlantic Council's jurisdiction, but, for the area, we have habitat in the map services, which includes a lot of different information, from SEADESC, Harbor Branch, and Ocean Exploration dives, and there's a lot of cool stuff in there. The multibeam bathymetry has been growing, and the Okeanos cruises that they've been doing over the last couple of years have really gained a lot of insight to what's going on, and so it's been really great that they make it so accessible and easy to get to, and so kudos to

them. Then, finally, just the nautical charts, which you can get in a lot of different places, but this actually is pretty popular. From the web server statistics, it gets hit quite a bit.

This slide just demonstrates how the REST endpoint for the map services can be used to create a lot of different things. We have the ArcGIS Online products, and this map is designed using the data layers from the map services, and you can change the -- We didn't really change things up, but, for consistency and time, we kept this the same, and then you can take your web app and Story Map using that, and so we look at different examples of this.

The ArcGIS Online web maps are a great tool, and there's not a lot of analysis that you can do if you don't have an organizational account. If you have a free account, you can do some basic things, and I will show that, but they are the basis of all of the sort of web app products that you can design. These are examples of the leading web maps, and they've been updated a lot for the councils over the years, but I will show you the ACCSP one, quickly, and then all of these are linked to the web maps, so that you guys can explore them on your own.

This is an example of a web map, and it doesn't look very exciting, and there's not a lot going on, and we only have one data layer, but the content is actually some non-spatial data that we have related to the ACCSP statistical area grids, and so there's over fifty years of information here. When you click on an area, you can see the records and pick your time period that you're interested in, and so we'll just look at some of this latest data. You can work with the table a little bit, and you can sort. White shrimp is the most dominant species for that area for this time period, for 2016 through 2019. We could look at statistics, and we can see the sum of values is ten million pounds for the whole area for those three years.

If you know some of those tricks, you can do a little bit with the web maps, and I will just show you quickly a dashboard that is in web maps, but it presents the information in a different way, and it's a lot more useful, I think, and so, here, this chart is showing, for all of the area, the dominant catch, and these are non-confidential commercial landings for this time period, and, at the bottom, you can scroll through the different five-year bins that we have created.

White shrimp was almost half of the catch, landings, in this timeframe, and the previous year it goes down a little bit, and you can see the brown shrimp and Spanish mackerel and king mackerel. As you scroll through, you will see the different timeframes, and so rock shrimp is up there, and you can see how many pounds for that five-year period for rock shrimp, and it was interesting to see how, back here in the 1990s, they were catching a lot of rock shrimp, and you can also select a particular area that you're interested in, and, in this chart, we will update and show you just what the dominant species are for this particular area. That's a product that is pretty easy to create and a lot more meaningful than just a web map, which did have a lot of information, too.

Then web apps are being developed through ArcGIS Online, and it's really easy to do. You don't have to be a programmer to figure it out, and you can add different widgets and things, and widgets are like tools that you can add and you can customize for your data, and this is a lot more inclusive than the previous web servers that we used, and all of the modern browsers are supported, and so people with iPads and stuff can use the web apps as well.

This is the managed areas map, and so this is -- Information about what this web map does is here, and there's a measurement tool that we can change our units, and you just click and double-click

to get this. We can make a map image, or we can get a little fancier and make a new map title. Now we have changed the base map, and the legend shows you everything that is in the map. This is the area where you can click things on and off and move things up and down. If you click on the ellipses next to the name, there is more options, and it gives you a description of the data that it contains.

We can add data to the map. To get that, you need an organizational account, which is also ArcGIS online, which has tons of data, and I will just add some sea surface temperature data, and here's that REST endpoint that I talked about earlier, and you can email a map service from NOAA, and you can have that here, and you can have your own shapefiles or CSV or KML or GPX or Geo JSONs as well.

This is a query tool, where you can select the tool, and you can do some things with that selection and you can create statistics, and you can create your layers or save your content and so on. Then, finally, there is a screening report. You can click on the SMZs and see which one is where. Here is the Deepwater Coral HAPCs, and you can see how much area is contained in that box, and then we can create the report. That's the managed areas app, quickly, and most of the tools are similar.

Then another product that you can create are story maps, which are a great tool. They're a web-based application that you can share with context and a myriad of text and multimedia content, and it helps explain pretty nicely what you're doing. I think that Cameron and the council has really enjoyed the story map format and have created maps for a lot of different issues.

For this example, we'll look at the managed areas. This story map gives you more information about the different managed areas and MPAs, so we can look at the different ones in the region, and you get more information about the MPAs and pictures and regulations that are associated with the MPAs. Then special management zones, and this links to the coordinates, if you need it, and then all the maps you can click on and get information. Then here's the Oculina HAPC. Here's the closed area. Then coral, and so it's basically all that information that was in the web app that is now in story map format, and it's pretty engaging, because of the pictures, and it offers more explanation.

Then here's a little bit about how the dashboard is used, and we have an IIS web server that generates files for -- We generate statistics for the council, and so the use has varied over the years, and 2019 was good year, and 2020 was -- This just shows a graph of the daily use from 2019 and the top referrers for the dashboard, and most people just have the link and are coming right to it. They have our projects page on the myfwc.com website, and so that generates some traffic, and then about a quarter of the referrals come from the South Atlantic Council site.

These are the most popular pages. The dashboard, this first line, is basically the same thing as the index, and so most people go to the web applications, and the GIS data and the map services are the next most used. These are the browser types and devices, and there's a lot of information in these IIS logs that we analyze with another product, and so you can tease out all of that information, and it's useful. Then the data downloads for those, the shapefiles and KMZs, and these are the top referring sites for that direct link.

Then this chart shows you the web server resources and spatial data, and that's resources in this light green, and so this is number of visitors per year, and then the map services is in blue, and so

this gives the number of map services, and so 2018 looks bad, and I think maybe something happened to our web server, but, anyway, 2020 did really well for the map services, and I think I can explain why, because I changed a setting for the managed areas web application, and it was more easily discovered, and so that really jumped up a lot last year. 2017, I just wanted to point out was only a half-year.

Then, quickly, I will just show you some screengrabs from the Hub that we're working on. We didn't get to finalize it, and I don't know if it's going to take off or not, but we hope that we can expand it, because there's a lot of great tools available in this Hub product, but it's pretty new to ArcGIS Online, and it's real easy to make your information discoverable.

This launch page has links to the story maps and the dashboards that we've developed, and you can explore the data and click on special management zones, and it will bring up the information that you can find, anything that has "SMZ" tagged shows up in another page, and then we're going to add the Fish Rules app on the launch page as well, and we just have a few more pages worth of managed areas that you can access, the managed areas, story maps, and apps. The fisheries has a link to the web app, and I included this best fishing practices HTML 5 tutorial from the South Atlantic Council's website, and then I have integrated the ACCSP dashboard that I showed you earlier.

Then, finally, the EFH page, where you can learn about all kinds of things, and so that was quick, and I just wanted to thank you for this opportunity and give a shoutout to Roger for recognizing the connection for GIS, and this project pulls a lot of data from disparate sources and provides a framework that's really easier to get a better understanding, and there is my email, if you need to reach me. I will answer any other questions, if anybody has any.

MR. PUGLIESE: I will just field it from here. I need to pull you off as presenter, and so I can show the hands, but there are few enough people on. Are there any questions for Tina? Everybody is thoroughly burned out today. Go ahead, Rene.

DR. BAUMSTARK: I just wanted to say, Tina, it's nice to see how far we have come, or you have come, or we, I guess, in this application, as far as just -- Thank you for making the data easy to get to and directing the tools towards the questions that folks ask and implementing all the new technology as it comes in, and I think you've done a great job of staying on top of everything and making sure that we're leveraging the latest and greatest and, at the same time, making the tools easy to use and effective, and so thank you for all of your efforts on this. It looks good.

MS. UDOUJ: Thank you, Rene.

MR. PUGLIESE: Brian.

MR. HOOKER: I just wanted to let you know that I'm actually still here. Tina, I really appreciate it, going and preserving my time in the morning, but I just wanted to comment on those statistics, and they're always interesting. When and if there's more activity on the Atlantic for offshore wind, I think we'll see how the statistics jump incredibly, as people think about these areas, but it's always interesting, looking at those statistics and seeing how they can change or track to different management actions, either from the fisheries management council or from other

agencies, but, that scoping report tool, is that more recent? It looked like a change, maybe, from the last time you gave this presentation, or is it unchanged and just my memory is faulty?

MS. UDOUJ: The dashboard for the landings?

MR. HOOKER: The reporting functionality. It looked a little --

MS. UDOUJ: I think I haven't changed it.

MR. HOOKER: You faded out there, but --

MS. UDOUJ: The reporting tool I think has stayed the same.

MR. HOOKER: All right. It's just my faulty memory. Thanks, guys.

MS. UDOUJ: Thanks, Brian.

MR. PUGLIESE: Wilson.

DR. LANEY: Thanks, Tina, for the great presentation. It's a tremendous tool, and you all are to be commended. Everybody that has worked on it is to be commended for having put it together, and I seriously doubt, although I confess that I haven't gone to the other council websites and delved into them in detail, but I seriously doubt that any other council has as comprehensive a database available and has made it as easy for stakeholders to jump in there and create maps and reports of interests to them, and I just hope that there's wide appreciation for that, and, at some point, Tina and Roger, is there a plan to put a report out on the use?

I mean, Tina showed us a lot of graphics today about the use of the tool and products that had been produced with it, and I think it would be very useful to try and compile something that could be provided, certainly to the council members, but also to the general public and stakeholders at-large that shows how much the site has been used and how much utility it has.

MS. UDOUJ: There is a lot more in there, in those statistics, and it was kind of time-consuming to work through them. The files are huge, and so I had to start after 2018 and start separating them into quarters and reporting on the January through March and so on, and so it's harder to get the nice-looking graphs with that, but it certainly can be done. I think that it never really was announced or pushed out with a press release or anything, and so it's just kind of been working, and so there's definitely room for improvement and updates, but we've worked hard, and I appreciate the positive feedback. Thank you, Wilson.

MS. DEATON: Tina, I just want to echo thanks for the run-through and the tutorial, and I wonder if you have a tutorial like that, a video, where people can -- You can walk people through it when they come to your website, or is it pretty --

MS. UDOUJ: I have not.

MR. PUGLIESE: We've been talking about that for a while, and we need to do it, because, every time I see it, there's so much more that has been refined and revised and is right on the cutting

edge of the newest technology from ArcGIS and Online and from the really good presentation of how this information is there, and that's, I think, as we discuss how to expand capabilities into the future or whatever, having anything -- Whatever the council ends up wanting to keep for tools, I think it's going to be important to have that -- Beyond just the hard copy, but videos that provides that.

MS. UDOUJ: I do think it would be very helpful.

MS. DEATON: You make it look so easy, and that's the thing, and so, if I was to get on there by myself, even though I've even been to your trainings, I would probably still struggle, and you might want to do that video.

MS. UDOUJ: Right, and I do need to step back and get some people who haven't used it before, and it's all very intuitive to me, but --

MS. DEATON: Yes, to you.

MS. UDOUJ: Thanks, Anne.

MS. DEATON: Is there anything else on that, Roger?

MR. PUGLIESE: Just other than, as members have the ability to provide additional information on how they use it, or other people have used this, that's going to be important, so that gets weighed-in as the council discusses what they want for tools and what is maintained, because some of these -- That's going to be part of the review of the habitat, is what's the utility of those and who is using them and what are they used for, and is it meeting council needs and EFH needs and habitat, et cetera, and so it's important that you all weigh-in, either now or later, and we're running out of time now, but I think what we could do is open up, after a break tomorrow or something, and just maybe touch on that, because I think that's going to be important.

As I said, some of the things are literally just coming out, in terms of the operational capability that Tina has provided, and there is things beyond this that are connecting with our ocean observing partners that have crosswalks, crosswalks with BOEM. From what Brian says, I think there's going to be -- With everything going on with wind, there's opportunities for all of us to keep that collaboration going, but it's going to be important for everybody to highlight how they're using it, or their staff or other people they know, to the council.

MS. DEATON: Okay, and so do you want to hold off on taking questions and comments, since we are right at -- We're at 5:14.

MR. PUGLIESE: I think what we're going to have to do is maybe the last two, Paula and Rene, and then we're going to have to cut it off, because they have a scoping session that's starting, and we need to be offline shortly.

MS. DEATON: All right. So you do want to let them talk? Trish had her hand up, also. Now they're going away.

MR. PUGLIESE: Paula I think does, and just the last comments, and then we can move on.

MS. KEENER: I will just say, very quickly, if you haven't already -- Tina, thank you for that excellent presentation, and, if you haven't already collaborated with the folks at OCM here in Charleston, for the digital coast, I would just recommend that you think about doing that, but excellent presentation and excellent product. Thank you.

MS. UDOUJ: Thank you.

MS. DEATON: Okay. Then why don't we see if there's anybody that is still on the line from the public that would like to provide any comments right now. All right. Well, we will provide that opportunity again tomorrow, at the beginning and end, in case there are, and, unless there is something else, we can call it a day, and we'll be back tomorrow at 9:00, and we're scheduled from 9:00 to 12:00, and first up will be Brian Hooker talking about BOEM energy, and so if everybody could just get here a little bit earlier, so we make sure mics are working, that would be great. With that, thanks for coming, and great input today, really great input, and discussion. I think we got a lot done, and so we'll look for you tomorrow.

(Whereupon, the meeting recessed on April 15, 2021.)

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APRIL 16, 2021

FRIDAY MORNING SESSION

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The Habitat Protection and Ecosystem-Based Management Advisory Panel of the South Atlantic Fishery Management Council reconvened via webinar on April 16, 2021 and was called to order by Chairman Anne Deaton.

MS. DEATON: Good morning, everyone. I hope you all got rested after a big day yesterday. Again, my name is Anne Deaton, and I'm chairing the meeting, and today is the last of the three days, and we're on the agenda from 9:00 to 12:00. Before we get started, our first presentation will be from Brian Hooker on a BOEM update on research and energy development, but, before we do that, I wanted to see if there's anybody on the line that would like to provide public comment. If you do, they can speak, right, Roger? They can just unmute and --

MR. PUGLIESE: Raise your hand. Anybody that's online that would like to make a public comment, raise your hand now. I am not seeing any hands raised right now.

MS. DEATON: Okay. All right. Then let's just get right into it, and Brian Hooker, as you all know, is with BOEM, and he's on our AP, and he has provided a lot of good information for us over the years, both with oil and gas and wind, although he is in the renewable energy section. We also have Rick Robbins and Brian Bonito that will speak after him about specifically the Kitty Hawk Wind Project, and so I'm going to just turn it over to Brian right now. Go ahead, Brian. Thank you.

MR. HOOKER: Good morning, everyone. Happy Friday. First, I want to apologize for not being able to contribute more over the past two days, and you guys have done a marathon job of discussions. Things are, as you're about to see in these slides, pretty busy over here at BOEM, and it's hard to get any time in anywhere, but I do appreciate this opportunity to give you guys an update on where we are.

Again, for anyone who is not aware, my name is Brian Hooker, and I'm the Biology Team Lead in BOEM's Office of Renewable Energy Programs, and I'm based out of Sterling, Virginia. Next is just I'm just going to kind of go through where we are, what the status of our leasing is. As a reminder, we've done eight competitive lease sales to-date, and we have seventeen active offshore leases, all of those in the Atlantic, and we have approved ten site assessment plans, and site assessment plans are basically the plan to put out meteorological buoys. It used to be, way back when the program first started, that people were building meteorological towers, and now they're basically just lidar buoys, and so it's a pretty simple plan these days.

General activities plans and research plans, two of those have been approved, and what that's referring to is like a research right-of-way for the Block Island Wind Farm and the Coastal Virginia Offshore Wind Farm, those two turbines.

On to construction and operations plans, and these are the commercial-scale actual wind facilities, and we have, currently, fourteen under review, and it's quite a bit, and remember that you could have, actually, multiple projects within a single lease area, and so you won't see the construction and operations plan necessarily match exactly the number of leases issued, because some of the leases were large enough that multiple projects could be built within the same lease area.

We still are anticipating, within the next twelve months, another two construction and operations plans, and we have guidance documents that we just note that we have issued for the lessees, and we have additional leasing still under consideration, and that includes California, Oregon, and Hawaii, and we just announced, I think it was this last week, additional leasing in the New York Bight, and there is interest in additional leasing in the Gulf of Maine, and then, as I will get to in a minute, more in the Mid and South Atlantic, off the Carolinas and/or Virginia as well, and so there's interest in additional leasing.

The only real federal steel in the water is, as I mentioned, the Coastal Virginia Offshore Wind Project, which has been in operation -- It hasn't been a whole year yet, but they energized late last summer, and so they'll be coming up on a year this summer.

I think I presented on this last October. For those who just need a reminder, under the previous administration, the President issued a withdrawal notice of certain areas for leasing disposition, and it affected consideration of any new leasing, beginning in 2022, the summer of 2022, and ending in December of 2032, and so, basically, it affects the renewable energy program, oil and gas program, but it does not include shore protection, beach renourishment and restoration and so forth, which I know, yesterday morning, you guys had an active discussion on that aspect of BOEM's responsibilities.

Anyway, nothing in this withdrawal affected the rights of existing leasing leases in the withdrawal area, of which the next presenters hold the only lease in the withdrawal area, and that's the Kitty Hawk lease, and so it doesn't affect them in any way.

I did want to note, on this slide, and I think, as I just mentioned, the Governor of North Carolina has reached out to BOEM, expressing an interest in trying to move ahead with some additional leasing, and I think the idea being that, well, we have some areas already identified, and can we move forward on some of these areas, ahead of that July 2022 deadline, and so that's under discussion, and, as I mentioned, I think the Governor of Virginia has expressed interest in some additional leasing off of Virginia as well, and so those are active conversations.

I think BOEM was meeting with the governor's office either today or yesterday on what options might be available for additional leasing, or actually any -- Well, I guess it is additional leasing off of North Carolina, in addition to the Kitty Hawk lease area. I did want to pause -- Well, I will stop for questions at the end.

The next slide is just regarding the Environmental Studies Program, but, before I get into this too much, I think Wilson, before the meeting began, brought up some good questions, I think, regarding policies around access to areas, and perhaps co-locating other types of facilities, like aquaculture and lease areas. I think this is a good opportunity to update the advisory panel on what the status is on that.

In some places in the North Sea, in Europe, they have the policy that trawling is incompatible with -- Due to some cable protection treaties, and, therefore, trawling is prohibited in offshore wind facilities in several countries in Europe, but not including the U.K., and I think -- Well, I will stop there, and so the U.S. has a very similar approach as the United Kingdom, in that there is no prohibition at all on other activities occurring within a lease area, and so I just wanted to make that really clear, and, as a matter of a fact, in the North Sea, now that some of the turbines are getting so big and being spaced farther apart, there is actually new efforts to allow fishing in some of the newer facilities, going forward, to be able to access certain resources and design considerations going forward.

Again, Europe has already a much higher level of activity than the U.S., and so they still have ambitious goals of really increasing wind power, even above and beyond what they already have, and so I did want to make that clear, and I know that, as Rick Robbins mentioned at the beginning, the Coast Guard has said repeatedly that there is no intention to do any type of rulemaking around or restrictions around these facilities.

If they were, for any reason, having to do that, if they determined for some reason that was necessary, it would have to go through a formal rulemaking process, but, again, that's not anything that BOEM or the Coast Guard currently anticipates happening. For Block Island, you're pretty much allowed to go right up to it, and there is temporary construction setback zones, for safety, but, once those construction zones have been lifted, the access is open.

Then, as far as co-locating other facilities, I can tell you that I think the offshore wind industry is still so nascent in the U.S. that the idea of co-locating other facilities I think is potentially very far off in the future. However, if you want to ask Avangrid more details on what their thoughts are on co-locating activities, I'm sure they can give you their thoughts, but I don't anticipate any time in the near future where aquaculture facilities would be co-located, and I think there's just, again, a lot of issues to be worked out and comfort with the U.S. regulatory environment before

embarking on co-locating other facilities within lease areas. I just don't anticipate seeing that as being a near-term use.

So on to this slide, the Environmental Studies Program. Again, I just want to remind folks that we do a studies development plan every year, and we concluded our solicitation for 2022 last winter, and we are now -- We have just wrapped up kind of our review of what studies for 2022 we -- Actually, for 2023, that we want to include in the studies development plan, and that will go through the Standing Committee for Offshore Science, or COSA, at the National Academy of Sciences, and then, when we have the results of these studies, they're incorporated into our environmental assessment and decision-making process.

That's really all I had for my presentation today, just to, again, try to give you an update on where we are with leasing, and, obviously, we have a lot going on, and the Vineyard Wind Project is -- We issued the final EIS on that, and we're anticipating a record of decision on that project in the very near future, and that's a big focus right now of the agency, is the final approval of the first commercial-scale wind project since Cape Wind. Roger, I can take any questions now, or comments.

MS. DEATON: Thank you, Brian. You said, at the beginning, how many of the different stages of development there were, and so the only -- You said steel in the water, and that was just the Virginia research one, and is that correct?

MR. HOOKER: That's correct, in federal waters. There's the five turbines off of Block Island, Rhode Island, but they're within the three-mile mark in state waters, and so we were involved in the cable permitting, because a cable went through federal waters between the island and mainland, and so we did have some involvement in that, but that was a state-waters project, or a state project.

MS. DEATON: All right, because I thought there was at least one up there, and I though the Martha's Vineyard was already operational, but I guess not.

MR. HOOKER: There have been a lot of meetings, and a lot of assessments, but, as far as like final approvals and actual construction underway, in federal waters, we only have --

MS. DEATON: Could you remind everybody, and so, because of this -- I guess it was a law, but, after 2022, the withdrawal, at what stage do they have to be to be exempt from that? Like Avangrid's can go forward, right?

MR. HOOKER: Yes, and the Avangrid Kitty Hawk is not affected by this at all, and it's only for any new leasing, and so I think what the interpretation is, it's that any new leases have to be completed by July 1, 2022, and so the leases would have to be issued by July 2022.

MS. DEATON: By issued, you mean somebody requested a lease and got it?

MR. HOOKER: Well, yes, whether it's a requested lease or we do it through the taskforce process, where BOEM is the one kind of identifying the lease area and then putting it up for auction, and we do have -- As you're aware, we do have some areas, planning areas, that we have identified south of Cape Hatteras and extending down into South Carolina.

MS. DEATON: Right, and so that's what I was wondering about, the Wilmington and the South Carolina ones, since we're at the South Atlantic here, and those are -- They have not -- They are not far enough --

MR. HOOKER: No leases have been issued for those areas, and so they wouldn't -- If anything were to occur on those areas, leases for those areas would have to be issued by July 1, 2022.

MS. DEATON: Okay. Wilson has his hand up. Go ahead, Wilson.

DR. LANEY: Thank you, Anne. Brian, is there any possibility that the new administration is able to rescind that withdrawal? Is that an option? If it is an option, is it likely at all?

MR. HOOKER: I think that Congress is trying to look for guidance on this, because you have to remember -- I think this is the same authority that President Obama used for no oil and gas leasing in the Northeast, and I think some areas in Alaska, and I think the courts determined that it is -- There isn't necessarily a function for the President to -- For the next President to rescind it, but I think Congress is perhaps looking at taking up a fix, and I think that's the current understanding, is that it might have -- If this is to change, I think it would have to come from Congress, but I am -- That's all I -- That's my current understanding anyway.

DR. LANEY: Okay. Thanks. I was just curious.

MR. HOOKER: It's an area of active discussion and trying to understand what the authorities are and so forth.

MS. DEATON: It's complicated, because it includes both renewable and non-renewable, oil and gas and --

MR. HOOKER: Correct.

MS. DEATON: Paula.

MS. KEENER: Thank you. Brian, thanks for the information. This probably will fall into the next presentation as well, but I was wondering if you could speak to any of the multiple use efforts for some of these platforms other than aquaculture, the potential around the platforms, particularly in light of innovative technologies for monitoring.

MR. HOOKER: I think there are a lot of options there. I mean, these are -- The facilities themselves are private property, even though we ran a lease for them, and so I think attaching observation devices to them is something that we strongly encourage interested parties to reach out to the lessee to discuss what opportunities may be available to that end, and, again, I think you're correct, and Avangrid may be able to speak to what their company policies are.

I think it may vary from company to company about the level of additional activity around the foundations and structures that they're dealing with, but I think there are some lessees that have expressed an interest in having some type of environmental monitoring, using the facilities for environmental monitoring, and I think Orsted -- I don't think this is directly related to your question, but one particular company recently signed an MOU with National Marine Fisheries

Service, or excuse me, but I think it was actually NOAA, and not the Fisheries Service itself, on making a lot of the metocean data collected at their facilities open, directly open, to NOAA, and I think it had to do more with meteorological data probably more than anything else, but, anyway, there's a press release on that and what that data-sharing relationship is between Orsted and NOAA.

MS. KEENER: Okay. Thank you.

MR. HOOKER: Actually, I will share that with the group. No more questions? I guess it is Friday morning.

MS. DEATON: Wilson has a question.

DR. LANEY: Brian, one more, and Rick might be able to answer this one too, but I was wondering if any of the lessees had been approached by any researchers who are doing acoustic telemetry about putting receivers on the wind turbine structure.

MR. HOOKER: I know there have been some discussions around that, and I don't recall, off the top of my head, which project in particular, but I know that is something that has been discussed, and, again, I think some lessees have been really receptive about it, but I think it was a lot of details on what and where, and each foundation is custom built for the site, and you really have to have -- I really strongly encourage these conversations early, very early, in the process, because sometimes like attachment points and so forth might be few and need to be thought about early in the process, and so, anyway, I think that might be a good question for Avangrid, to get at least one company's --

DR. LANEY: Okay. I think it would be -- It's a wonderful opportunity, especially for the marine mammal folks, because they have the acoustic listening devices that can discriminate, I understand, to species, and I'm sure you know more about that than I do, but, for both acoustic telemetry programs for all these different species of fish that are being tagged and for marine mammal monitoring, I think it would be wonderful if some sort of collaboration could be developed.

MR. HOOKER: Yes, and I know that -- I think some meteorological buoys that some companies put out I think have had Vemco acoustic receivers deployed as part of those, and those are generally temporary, and they're only there for a few years, but I think that has occurred for some of them already, and I think there's still active discussion on potentially more permanent monitoring devices on actual foundation structures, or adjacent to. I think, even if you're deploying within the facility, I think your chances of getting it trawled up inadvertently I think could potentially decrease if you deploy it close to a foundation, and so those are considerations, too. There might just be an area where you could feel safe that your devices aren't going to get trawled.

MS. DEATON: I think Brian Benito wants to add something. Go ahead, Brian.

MR. BENITO: I just wanted to -- You had said that maybe we could speak to that, and I just wanted to let the attendees know that, over the past two years, we have been doing marine mammal monitoring, via shipboard observations and as well as aerial surveys, and some of that observation and monitoring has included passive acoustic monitoring, or PAM. With regard to actually attaching anything on our buoy, to do that monitoring while the buoy has been deployed, we do

not have that going on our setup right now, and so I just wanted to let folks know what we've done some acoustic monitoring, and that's going to be presented to the public when our COP is noticed, our construction operations plan, and so it's certainly something that Avangrid Renewables and the Kitty Hawk Project is looking at.

It's something that, as you know, Brian, BOEM and NOAA will evaluate, in terms of what those potential impacts to marine mammals may be, and particularly associated with our pile driving and construction campaigns, and so certainly more to come on that, particularly for Avangrid Renewables and Kitty Hawk, as we work through the NEPA and regulatory process, and so I hope that helps answer one of the questions there.

MR. HOOKER: Thanks for bringing that up, Brian. I didn't mean to diminish the amount of work that all lessees across projects are doing, as far as like pre-construction surveys and types of observations during construction, and then even post construction, and so those are definitely parts of everyone's plans, and there's a lot of work going on, both for lessees and from the BOEM side, and I think the question I was trying to answer was more the long-term monitoring platforms outside of the existing kind of pre, during, and post-construction monitoring that is part of each individual project.

MR. BENITO: I totally understand that, and, as you mentioned, I think every project is specific, and the development is specific, and certainly, from Kitty Hawk's perspective, we're kind of just beginning our long journey with our stakeholders, and Rick and my team have been out there, but, as we get closer to becoming a more mature project, a project that has folks able to look at it through that NOI process, which we're expecting later this year, then those conversations certainly will evolve.

MS. DEATON: Great. Paula, go ahead.

MS. KEENER: Thank you. I would just like to -- Coming from NOAA's Office of Ocean Exploration Research, or previously coming from that, I want to encourage us to think about not just the monitoring component capability of these platforms, but also the exploration capabilities of multiple uses of these platforms, exploration of sound and sea, exploration of eDNA, et cetera, and we can't monitor and protect unless we first know what's out there, and so I'm just encouraging innovation, in terms of exploring and the use of these long-term monitoring platforms, and so I know, from my fisheries biology background, that I tend to still get focused on monitoring and looking at the trends, the long-term trends for the monitoring element, but the exploration element is also so important, in terms of filling in the gaps of our knowledge about the ocean. Thank you.

MS. DEATON: Great comment. All right. Is there anybody else, or should we move on to Rick and Brian's presentation? All right. Thank you very much, Brian. We appreciate your time.

MR. HOOKER: No problem. Thanks, everyone.

MR. PUGLIESE: Thank you, Brian.

MR. ROBBINS: Thank you, Madam Chair. Good morning, everyone. I'm Rick Robbins, Fisheries Liaison for Kitty Hawk Offshore Wind, and I'm joined today by Brian Benito, the Senior

Permitting Manager for Kitty Hawk Offshore Wind, as well. We really look forward to the day when we can get together in person and discuss the project with you all, but we really appreciate the opportunity to do this by webinar today, and we look forward to the conversation.

I'm excited, because we finally have a lot of nice, detailed fisheries information. When we first got together and talked about the project, we had more high-level information, but now we have actual VTR data and survey data out of the project area, and so we're looking forward to today's discussion. I will turn it over to Brian for an overview of the project.

MR. BENITO: Thanks, Rick, and thanks for having us. As Rick mentioned, I will kind of give just a high-level project update, and then I know, most of the interesting stuff that you all probably want to focus on, Rick will get into later, in pretty good detail, in the presentation, but just a general overview, for folks that may not have talked to us in the past, or who might be joining us for the first time, Kitty Hawk Offshore Wind leased about 122,000 acres, and it's approximately twenty-four nautical miles east of Corolla, North Carolina.

We're also showing here a distance to Rudee Inlet of approximately thirty-six nautical miles, and the reason why we show that is because, while we are leased off the coast of North Carolina, we have an export cable corridor, and so we need to connect the wind turbines offshore to somewhere onshore, and we're currently exploring that connection point, that landfall, to be in the Virginia Beach, Virginia area.

Avangrid Renewables, my company, successfully obtained this lease from a competitive bid process that BOEM put forward in 2017, and, since then, we've really been site characterizing the area and doing our metocean gathering and our offshore surveys, to get our benthic and our bathymetry and our sub-bottom details that are associated with various environmental assessments, as well as engineering needs, and so all of that work we've been doing in the past two-and-a-half years really helped formulate and put together our construction operations plan.

In the construction operations plan, which is with BOEM, and Brian's colleagues, for review, for its sufficiency and completeness, currently, we put forward a project design envelope, and so a PDE, as we call it, allows us and the developer to present a range of potential impacts associated with construction and operation of the project. The purpose of many, if not all, developers, and certainly why Kitty Hawk put forward a PDE, is because, believe it or not, this technology is rapidly evolving, and so many of you are familiar with Vineyard Wind.

Vineyard Wind put forward, in its PDE, an eight-and-a-half megawatt turbine, and that was three years ago, and an eight-and-a-half megawatt turbine was the biggest and baddest turbine that was on the market. As we're probably all well aware, there was a year of a supplemental review associated with the Vineyard Wind project, and, because of that year review, they had to actually lose their desire to -- Their PDE is no longer really applicable, and so they had to reevaluate their PDE to accommodate a fourteen-megawatt machine.

What most of us are doing are putting forward a range of options, and, as you can see on this slide, it kind of gives you all, as attendees, the overview of what our PDE is associated with Kitty Hawk, and what we're looking to do, and what we've put forward to BOEM in our COP, is an 800-megawatt project at the point of interconnection, and the point of interconnection will be at

Corporate Landing in Virginia Beach, Virginia, and what we've got for a wind turbine generator is up to a twenty-megawatt machine.

You can also see here that, while our whole lease is about 122,000 acres, we're looking to do about 50,000 acres of development for this first project, to accommodate that 800 megawatts. We've got about sixty turbines, and so that's up to sixty turbines that we're proposing, or that we've proposed, and that would be representative of a fourteen-megawatt machine. As you get a larger machine, you're able to space out those machines further, and, obviously, each machine has greater capacity, and, therefore, you need fewer of them to get to where you want to be at your point of interconnection, and so, for us that's 800 megawatts.

As you can see here, the MSL to lower blade tip, and you're going to be looking at about eighty-nine to 108 feet, and so, again, that's based on that fourteen-megawatt machine to twenty-megawatt machine, and we've got various options for foundation type that was put forth in our COP, and monopile is kind of your standard, your traditional, and you probably recognize it on most offshore wind farms, and we also have a jacket, which you will notice was utilized at the Rhode Island project, and so we're looking at all types of foundations at this stage still.

We have one offshore substation, or, as we call it, electrical service platform, and that will be located within that northwest corner, and then, as I mentioned, we'll have about a sixty-nautical-mile offshore export cable corridor, and this will be two co-located sub-sea cables at 275 kV. We have conducted a cable burial risk assessment, which is put forth in our COP, and it will be evaluated by BOEM, and, obviously, there are various other surveys and studies associated with our need to show that we're taking into account those environmental impacts.

This is just a representative schematic here of those two turbines within our PDE. As you can see, right now, the fourteen-megawatt machine is commercially available, and it's the machine that Vineyard Wind has just recently announced that it will be utilizing, and this is representative of the GE Haliade-X fourteen-megawatt machine. There is some software upgrades that you can do on this machine to get it up to about fifteen megawatts, but we're also showing a twenty-megawatt machine, which you probably haven't heard much about, because it's not necessarily commercially available, but our long-term planners view this as a potential option for us, if we are to experience any delays with our review or anything with our commercial dealings at Virginia and North Carolina.

With that, I will turn it over to Rick, and he'll start going through all of the data that he's been particularly leading the review of, as well as some of the newer state data that we've recently come into, and so over to you, Rick.

MR. ROBBINS: Thanks, Brian. Good morning again. I will run through some of the habitat data first, and then we'll get into the fisheries details. The depth range around the offshore export cable corridor ranges to thirty meters, and the depth range in the wind development area gets out to forty-five meters, and so just over twenty fathoms, and the depth is increasing as you run off to the southeast, through the project site, and the predominant seafloor feature is sand ripples, and we've seen that pretty consistently there in the bathymetric survey work. There are some mega ripples, as you get toward the northwest portion of the corridor, closer to shore, and there's no surprise there, but those range up to one-and-a-half meters in height, and they're in a more dynamic shoreward area.

This data here is coming from the grab samples that were done, the benthic sampling, and what we see is the surficial sediments are primarily consisting of unconsolidated sand and gravel and silt, and so the classification, in the nearshore area, is muddy sand and gravely sand, and then, as you come along the export cable corridor, it's fine and very fine sand, and then, when you get offshore into the wind development area, it changes a little bit, and it's a mix of fine and very find sand and gravely sand, and there is no hardbottom intersecting the offshore cable corridor or the wind development area, and these samples were completed in the survey campaign that wrapped up in February of 2020.

Looking at some of the other resources in the project development area, there was no complex habitat, and that is hardbottom, SAV, or biogenic reefs, that were observed in two seasons of survey campaigns, and there are no charted shipwrecks or artificial reefs within what we call Kitty Hawk North, and that is the wind development area, that northwest corner of the lease area, and there are three potential shipwrecks in the lease area to the east of that, and there are four potential shipwrecks adjacent to the offshore cable corridor. One of those is within state waters, and the remainder are within twelve miles to shore. There is additional survey work ongoing, and we're processing all the data from the bathymetric surveys, to confirm marine archeological resources, and so that will get some more investigation.

Taking a look at some of the more sensitive habitat in the area, fortunately, there are no HAPC, or habitat area of particular concern, intersecting either the offshore cable corridor or the wind development area, and the nearest is up there inside the Chesapeake Bay, and so outside of the project area.

Looking at the EFH, EFH for some species is fairly ubiquitous, and it covers a wide portion of the water column and range of the species, and that's the case here, with snapper grouper. There are 116 acres of snapper grouper EFH in state waters of the export cable corridor, and then a larger amount in the federal portion of the cable corridor, and 49,000 acres within the wind development area, and, as you know, this represents a very small, less than six-one-hundredths of a percent, of the snapper grouper EFH.

Similarly, taking a look at EFH for spiny lobster, the area is coincident with spiny lobster EFH, and I would just note here that, in fifty-five years of bottom trawl survey data, and twenty-seven years of observer data out of the area, there haven't been any spiny lobster records in the lease area or in the corridor, but, nonetheless, it is part of the EFH map for spiny lobster.

This is a high-level view of effort in and around the lease area, and this comes from VTR data, and this is a VTR heatmap, and you can see these on the data portal, and so you see the lease area there, and then some of the trawl activity that occurs there inshore of the area, and that's for mixed species, historically, for things like croaker and/or a little bit of summer flounder fishing, but then, east of there, you see the heat map, and that represents primarily trawling for squid, but, fortunately, there is really not much trawling in either the lease area or the corridor area, and we get a similar look now at gillnet effort, and you will notice a lot of intensity up there around Virginia Beach, and that's primarily the Rudee Inlet fleet and the Lynnhaven fleet gillnetting for spiny dogfish and seasonally for things like croaker and spot, when they come up in the bay.

Then, if you look at the lease area, southeast of there, you see a fair amount of intensity, and that's going to be the Oregon Inlet fleet fishing for bluefish and croakers and a variety of other species, as you move in and out across the various depths, but the VTR map here really doesn't show any effort in the lease area. Now, we know some fishing occurs in there, but, just looking across the VTR data, the intensity is very low.

This is much finer data, and this is VMS data, and so the squid boats are required to carry VMS, and you can see the data here coming off the VMS system, and it's quite precise, and this fishery is pretty much stratified from fifty to a hundred fathoms, and, primarily, they're fishing ilex outside of there. They will fish loligo a little bit shoreward of that, into about forty right there, forty fathoms, but you see the area east of the development, of the lease area, that's fished, and then going up towards the Norfolk Canyon, and, of course, north of there, there's quite a bit of squid fishing up the road, but, fortunately, that is occurring seaward of the lease area, and those boats -- Some of those boats go back to Hampton, Virginia, and some of them pack out up in New Jersey or Rhode Island, and so some of those boats are regional in nature, and some are local.

When we got started with beginning to work on understanding the fishing and the history of fishing in the area, both in the lease area and the corridor, we started with commercial fishery interviews, and these were detailed, and the captains have been great, very forthcoming, and they allowed me to collect oral history interviews, and the idea was to go to the people that had the most history in the area, and so, within each of the respective fisheries, I interviewed the trawl boat captains, and so those would be the captains that were fishing for summer flounder and, historically, a couple of decades ago, croakers in there, and then, going back longer than that, they caught some mackerels in there, and scup and other things, but that's getting into some older history.

The gillnet fleet, there's a fleet in Oregon Inlet, and there's a fleet in Rudee Inlet, and they fish differently. The fleet in Oregon Inlet primarily fishes drop nets when they're out there, and they fish unanchored gillnets, and sometimes they will float nets for bluefish, but they usually just fish drop nets on the bottom, and they're dayboat fishing. They bring the nets home at night.

Out of Rudee Inlet, they're usually fishing anchored gillnets for spiny dogfish, and also for Atlantic croaker, on a seasonal basis, and then there are conch potters that come through there late in the season, like in late winter, maybe in January and February, and so they will start to pass down there through the 4A buoy area, and so they conch pot a little bit. There are a few of them that conch pot down through the corridor, and then there's some conch dredge boats that fish out of Rudee Inlet, about five of them, and they fish just a little bit north of the corridor and then up into and around Cape Henry.

Now, Virginia has a small experimental shrimp trawl fishery, and that's what you see in this photograph, and those are a couple of the boats doing it. They just fish a sixteen-foot modified beam trawl, and they fish in state waters, and they do fish in an area that overlaps the corridor, and so there's some activity in that, and they've been going for about -- I think they're in their fourth year now.

Then there's still an active drop potter that drop pots out of Carolina for black sea bass, and he fishes around the lease area, and much more broadly, all the way up through the Norfolk Canyon area, and there historically has been a couple of the hook-and-liners that fish commercial sea bass

in the broad area, and so I found the one that had the most experience, and he's semi-retired, but I interviewed him, and he was a wealth of information.

Now, what we have is we finally have the VTR data, and this is nicely detailed. Now, what we can't see, because of the confidentiality requirements in the Magnuson Act, we can't see all the data by individual year by species, because, in this case, there are so few records that the rule of three that invokes the confidentiality requirement prevents us from seeing it at that level of detail, but we can still see and interpret quite a bit from this data, and so this is twelve years of data, and this is the cumulative catch.

If you look at the data in blue, that represents the export cable corridor area, and so all the VTRs coming out of the corridor, and, in red, we have all the VTRs coming out of the lease area, and you will quickly notice that most of the fish are coming out of the corridor, and that's because the spiny dogfish fleet that works out of Rudee works within about fifteen miles of the inlet, and some of that is coincident with the corridor, and so most of the fish that have been caught in the VTR series are spiny dogfish, followed by Atlantic croaker in the corridor, and then, if you shift into the red, you will see the lease area catches, and that's predominantly summer flounder, followed by a few other species, and you see some hits on Atlantic croaker, and a little evidence of monk livers, and there was some historical monk fishing in there, and most of that has since abated, and you see that little sign of black sea bass, and that's from that drop pot effort that I talked about before.

Now we can look at some of the trends in the data, and this is looking back to 2007, and so, again, this is out of the lease area, and the red line is the actual VTR, and so that's all the VTRs for that shapefile, and, if you notice, there was a peak in 2010, and we think that corresponds to catch of the summer flounder, and there was some summer flounder effort in there then, and we sort of cross-referenced that across our oral histories and across the observer data, and so we have other ways to try to ground-truth that, but that was a catch of summer flounder.

Then, if you will notice, since 2016, there hasn't been a VTR out of the lease area, and so there's been -- Over the last decade, there's been a significant decline in effort. Prior to that -- This is as far back as the data goes for matched records between VTRs and dealer reports, but, prior to that, we know there was more fishing in the decade before that on Atlantic croakers, but we don't see that here.

The blue line is an interesting product, and so GARFO has developed a model estimate of catch for all the Atlantic lease areas, and they use a methodology to account for the spatial uncertainty in the VTR data, and it's like a fishing footprint type of approach, and they have it on their website, but I will just note -- It's comparable, because VTRs are always going to have a little bit of grain of salt with them, and, in this case though, the modeled catch, approximately 50 percent of it, is ilex squid, and we know, from interviewing all the trawl boats, that they fish those seaward of the lease area, and so there's a caveat there, but, nonetheless, it's helpful to have a model look at fishing effort as well.

This is the same approach for the export cable corridor area. In this case, the actual VTRs are higher than the model data, but a similar type look, and the numbers are a little more consistent. They are consistently higher out of the corridor area, because, year in and year out, they're fishing in there for the spiny dogfish.

Speaking of spiny dogfish, this is just a quick look at the fishery in the State of Virginia. Most of the boats that are fishing spiny dogfish in the project area are fishing out of Rudee Inlet, and so we look at Virginia state landings, and the spiny dogfish fishery got cranked up in the early 1990s, and it was declared overfished in the late 1990s, after it hit sixty million pounds a year coastwide, in terms of landings, and it was entered into a stock rebuilding program in 2000.

The fishery, for all practical purposes, was closed in the Mid-Atlantic for a period of time, because of that, and then it gradually crawled back, and the stock was declared rebuilt around 2010 or 2011, as I recall, and then the quota began to increase, and, in recent years, Virginia has gotten some quota transfers, and that has allowed them to increase catch, and most of those come into Rudee Inlet, and so that's been a viable fishery in the modern chapter here.

This is a look at North Carolina's commercial croaker landings, and croaker have been very important for the dayboat fleet, the gillnets, out of Wanchese and Engelhard and Stumpy Point, but it's also been important for the trawl boats, and, if you look there, croakers tend to go through multidecadal cycles, and you see that. I mean, they've been through several in my lifetime, and one of them here is the last peak was in the early 2000s, and that's what those trawl boat captains that I interviewed were talking about. That's what they remembered fishing in that broader area, and a lot of them were caught south of the inlet, but they would fish sometimes in the development area, and that peaked -- They had a big catch back in the early 2000s, but it has since dropped, almost by an order of magnitude, and landings and catches have been really low in recent years.

This is a look at another important North Carolina fishery that's been real important for the drop netters, that same fleet that I just mentioned, and, if you went back earlier than this, the catches would have been higher still, but catches were quite high thirty years ago, and they have dropped off pretty sharply, but this has been a really important fishery, and the decline in multiple fisheries, bluefish and croakers and monkfish, some of these things help explain some of the attrition that we've seen in that fleet.

This is another dataset, and this comes from North Carolina Division of Marine Fisheries, and this is a sampling program dataset, and so it shouldn't be thought of as a census for catch, but this has been a really rich dataset, and North Carolina has a dockside sampling program for their gillnet fleet and for their trawl boat fleet, and it's a great data collection program, and it really gets into a lot of detail, and so, when a sampler goes to the boat and they collect their information from the captain, they ask them what depth they fished, and they also ask them what the waterbody was that they fished in, and the water body specificity that they collect is more specific than it is on a trip ticket, and so it's resolved at a finer scale.

Now, it's not resolved at a scale that allows us to say that these catches happen within the lease area, but it's resolved at a scale where the captain may have said that he was east of Oregon Inlet, or potentially northeast of Oregon Inlet, and so we sort the data looking at those areas as being a proxy for the broader general area of the project, and it allows us to understand some of the trends in the fishery, and it allows us to look at some of the finer scale information, and so we look here at the depth, and so we look at the depth of the project area, in the shaded blue, just to see what the coincidence is, but we also see trends.

The fishermen have told us that the late fall run of bluefish that used to come along the nearshore area that is closer to the beach, inside of -- This is twenty-something meters here, but, inside of

that, they would come through in November and December, and that run of fish had dried up, and you see that. You see, back into 2005, 2006, 2007, it kind of wrapped up, and so the modal depth of fishing has gotten deeper over time, and you see that playing out there, but you see how they fish, and they fish drop nets, but they also fish float nets, and so, when you get out to those greater depths, they're fishing float nets, but there's been a lot of change in intensity of this fishery. Back in the 2005 timeframe, they were fishing very intensively, and that has dropped off quite a bit in recent years.

This is a similar look. Now, this data is presented differently. These are individual trips, and so the catch weights is what is presented, and it's across years, and these are considered to be directed summer flounder catches, because they're over a thousand pounds, and these are all the water bodies east or northeast of Oregon Inlet.

Now, if you were to look at North Carolina's landings, you wouldn't see this type of pattern, because the boats in North Carolina and Virginia have been fishing further north over time, as the distribution of summer flounder has changed and shifted northward, but this is a really rich dataset for us to look at, because you see, out of those water bodies east and northeast of Oregon Inlet, there just haven't been any summer flounder trips since about 2010, and that's when we last saw that peak in catch in the VTR data, but this goes back to 1990, and you can see how much things have changed, but it's a really interesting dataset, I think, for us to consider, and one that we've been grateful to get from the State of North Carolina.

This has been a bright spot, just to shift gears, and this is a fishery that has become important for the drop net fleet that I mentioned, and these are Atlantic cutlassfish landings, and they're referred to likely as ribbonfish, but you can see, in the last five years or so, they've really taken off, and so they have figured out how to drop net on them, and most of this fishing happens down around -- It's within about ten miles of the 102 Tower, which is just southeast of the inlet, but that's going to be about twenty-five fathoms of depth.

Now, there are some ribbonfish catches, we think, that come out of the lease area, in the seaward parts of it, at least, and east of it, but this has been an interesting development, because they have developed a good market for the fishery, and so it's been one of the bright spots and one of the emerging opportunities.

This is a look at observer data, and, as we look at this, we try to look across all the available datasets, and it's been really helpful, but this is the Northeast Fisheries Observer Program, and so they're putting observers on some of the gillnet boats and some of the trawl boats, and the nice thing about this data is it's spatially reconciled, and so it's going to be precise, because they have to write down every set, or every tow, and the observer documents that, and so this is twenty-seven years of data, and we see twenty-eight trawl trips, ninety-three tows, most recently in 2012, and that kind of runs along with that decline in effort in there. There are three drop net trips, and so not a lot of drop netters, but a little bit of drop net data, and, not surprisingly, most of these boats were targeting summer flounder, and they would catch summer flounder, bluefish, monkfish, a little bit of croaker, a little bit of sea bass, and pretty much what you would expect to see.

This is some fisheries-independent data, and so this shifting gears again to look at that, and this is the NEMAP data inside the sixty-foot contour, and so they're going to be pretty much just inside state waters up there in the corridor area, and now this is done in 2013 and 2014, and so it's a

broader look, but it's still shoreward of sixty feet, and it's spring and fall combined, but it's pretty much the mix of fish that you would expect to see shuffling down the beach coming out of the Chesapeake Bay, or going into the Chesapeake Bay.

There's Atlantic croaker and spot and clearnose skate, weakfish, roundhead, and then a mix of other small fish, but it's pretty straightforward on that. Now, there are no spiny dogfish in there, and that's just explained by timing, because they go through after they leave in the spring and before they get there in the winter.

This is a look at the bottom trawl survey data, and this is fifty-five years, approximately, of data, and about sixty-five tows, I think, over that whole time period, and, if you look at it, there's not a lot there, and you see Atlantic croaker in the fall survey, and these are cumulative weights across fifty-five years of data, and so a little bit of Atlantic croaker, a mix of different rays. If you look at the spring surveys, you can see the spiny dogfish and clearnose skate. You have to go down to the bottom to really see the more recent commercial species, like summer flounder and goosefish and monkfish, and they caught a box of summer flounder over fifty-five years, and so that survey is just not set up to catch summer flounder.

This is where we look at the cohesion among the data, and I think this is interesting, because we started with the oral histories, and then we tried to get into all the different datasets that we could, looking at the observer data, the VTR data, the model data, and we see really strong agreement, in terms of presence of species. We see Atlantic croaker and black sea bass and bluefish summer flounder are there in all of them, and Atlantic cutlassfish is there in all of them, with the exception of the NEFOP dataset, but that's explained by the small sample size. There are only three gillnet trips in there. Ilex squid only shows up in the GARFO model, but, again, that has to do with the methodology that they use to account for the fishing footprint.

This is an illustrative layout of the array that Brian described, and I would just like to call your attention to the orientation of it, and this is for discussion purposes. It's an illustrative layout, and I think we all appreciate that some of these things are subject to revision, just because, when the final turbines are specified, as we get more meteorological data, et cetera, but this is oriented fourteen degrees east of north, and the reason for that is that that's what the trawl boats indicated was their trawl tow directionality, and it's coincident with the bottom bathymetry in the area.

If you look at that shaded contour there on the eastern part of the development area, where the pink meets the lighter and darker blue, you can see that bathymetry playing out, and that's the direction that they predominantly towed, and so we sought to accommodate that, as much as practicable, by orienting in that direction, and we were able to do that within the design envelope.

There was some discussion, at the outset, about monitoring, and I would just like to call your attention to some of these species, because I've been discussing this with Roger, but this is going to be a little bit different situation off of North Carolina, certainly, than it would be in the Northeast, but I think we can anticipate a number of pelagic species to take up residence in the project area on a seasonal basis, once it's constructed, and so you would expect to see mahi and wahoo and king mackerel and cobia and spadefish and, obviously, sea bass. Sea bass are there all year, but you would expect to see them associated with the turbines.

This raises some good questions about monitoring, and, as we think about it, there is some mix of demersal species, but there is probably going to be a pretty strong signal of pelagics that come through there seasonally, and so we want to think in innovative ways about how to effectively monitor some of these pelagics as they come into the area.

Looking up north of our project, just the experimental project off of Virginia, with two towers, all these species have been caught at the towers since it was commissioned and fishing was allowed around the towers, and so I think that's a pretty clear indication that we would expect to see the same, and I know some mahis have been caught around our meteorological buoy that's currently in the area.

In terms of next steps, we're going to be conducting additional geophysical surveys this year and a seabed mobility assessment this summer, and that seabed mobility assessment will help inform the cable burial risk assessment that Brian was talking about earlier. We'll also continue to socialize the fisheries data and the project details in an illustrative layout with commercial and recreational fishermen and continue to collect as much specific input from fishing history as we can, and I'm going to be available a little bit later this summer for individual briefings, whether virtually or in-person, and handle any fishery questions. Roger, that's all I have, and Madam Chair, and I'll be glad to answer any questions at this point.

MS. DEATON: Thank you very much. That was really interesting, and I think -- Do we have a copy of the presentation?

MR. ROBBINS: I sent it to Roger, and so I will ask him if he has distributed it.

MS. DEATON: I have something, but it didn't have the fisheries slides, which I would love to look at again.

MR. PUGLIESE: It's been loaded to the website under the late materials folder, and so it was -- We had the original placeholder, and then the update is there, and so it's available for download, and I do have it here jumped in for the PDF version of this too, so that if you want to reference back to this as you're asking questions on this, and so, yes, it's available over there, or I can go ahead and distribute it out, in addition to it being online, but it is in the briefing materials.

MS. DEATON: Yes, that's fine. Okay. Wilson has a question for you. Wilson, go ahead.

DR. LANEY: Thank you, Anne, and thanks, Brian and Rick, for excellent presentations. You guys have been doing a phenomenal job of keeping, I think, everybody in the fisheries management and fishing family well informed, and I can't tell you, from my perspective of thirty-eight years with the Fish and Wildlife Service, how very, very much that is appreciated, because it's not exactly the norm, in my past experience, and I know BOEM has a good bit to do with that as well, but thanks to you guys especially.

All of the fisheries data is great, Rick, and that's tremendous, especially all the work that you're doing to gather oral histories, and I think that's incredibly useful as well. The question I have is not really related to any of the fisheries stuff, and this is probably a question more for Brian, and that is, with respect to the turbines themselves, and decommissioning at a some future point, but also, and I guess it's an O&M question, and that is what's the lifespan of those turbine blades, and

I ask that from the perspective of having read a lot about the difficulty, at least at the time I read, the difficulty in recycling those turbine blades, and I also just wanted to see if you all were aware that there is apparently -- I don't know what they're made of, but, if they're fiberglass though, there's apparently some new effort ongoing to recycle fiberglass boats, by grinding them up and using them in various capacities, and so I just wanted to ask you about the blades themselves and what sort of things you anticipate for those, when they pass their useful life.

MR. BENITO: I appreciate that question, and I appreciate that feedback. We're very fortunate to have Rick on our team as a resource and all of his knowledge and real passion for making sure that he gets out there and keeps all of you informed, and so Rick really keeps us in line, and we're certainly happy to have him, and so I appreciate that feedback, Wilson.

With regard to your question on the blades, as you can imagine, we're -- As a renewable energy company, as a really socially-responsible developer, we pride ourselves on that, and, globally, we've been recognized, in various awards, as being one of the most ethically-run companies on the planet. We take this very, very seriously, and we recognize that it's our -- It's kind of our duty to push these envelopes forward, and so, as you had mentioned, with regard to the blades, that is something that many folks have read, in probably lots of publications, about how the blades get landfilled, and that's a traditionally way that the industry has handled those blades once they've gone past their useful life.

That being said, there's a lot of studies, as you mentioned, about fiberglass recycling, and that's certainly something that our CEO has spoken to on all-hands meetings to us, is a desire for us to continue to explore ways to reduce our impact and reduce our waste. It's just kind of in line with how we want to be as a company.

It's important to note that Avangrid Renewables, and our parent company, Iberdrola, we are super major when it comes to green energy, and we have a very low carbon footprint in our generation fleet, and that is every day being phased out, and so you'll find that, perhaps unlike some of the other folks that are out there, and not to cast any shadow on them, but we have been kind of walking the walk, if you will, for going on about three decades now, before renewable energy was kind of cool, right, or profitable, to be honest, and so we are looking at that, Wilson.

What I can tell you is, with regard to the useful life, we're pushing that envelope every year, and so our leases is set up through BOEM for twenty-five years, and we're already, as an industry, looking at how we can modify those leases to kind of push that out further, because the technology, as I indicated during my presentation, is really rapidly evolving.

One of the things that separates us from the onshore folks that do similar work is, as you can imagine, being out in the marine environment, it's just a much more costly, and potentially dangerous, environment to work on, and so, while we will have daily wind turbine technicians and engineers and electricians and all of that working out in the windfarm, once it's in O&M, one of the goals that we have as an industry is to minimize the amount of moving parts.

You'll see that one of the things that differentiates us from our onshore turbines is we have a direct driveshaft, and so we remove the gearbox, which is an area that typically requires lots of oil and lots of maintenance and checks, and so we really, in the offshore environment, look to make these things as maintenance free as we possibly can, obviously recognizing these are mammoth

engineering wonders, if you will, really, and so they do require constant TLC, but the industry is coming along really quickly and really working to minimize the amount of time we need to spend maintaining them, and so a long-winded answer there, sir, but, really, what I can tell you is our industry is keen on finding alternative ways to reduce our waste streams.

DR. LANEY: Thanks, Brian. I appreciate it.

MS. DEATON: I just want to really commend Rick and Brian, both Brians, Brian Benito and Brian Hooker, on the process that got you here, because I think it's gone very well, and it seems like we've been talking about it for a long time, but, by having scoping meetings, I know, within our state, multiple times, you addressed any conflicts and potential problems early on, and now, what I saw from that presentation, there is minimum overlap with essential fish habitat and really trying to avoid impacts from fishing activities, and not only are you avoiding impacts, but I'm very hopeful, in what you just said, about it increasing recreational fishing opportunities for some of those pelagic species, as well like spadefish and black sea bass. Several of those, there's been increasing concern on the population, and so I hope this is a really positive activity and a good example of what we could do more in the South Atlantic, and so I just thank you.

MR. ROBBINS: Thank you very much.

MR. BENITO: Thank you for that comment, Anne, and one of the things that we spend a lot of time, Rick and I, when we're chatting with BOEM and our stakeholders, is we really do like to give credit where credit is due, and we feel very fortunate that our lease area, in our opinion, and in our analysis, our surveys, our assessments of the natural resources associated with this project, it really comes down to the wind energy area. Our lease area was really just well sited, and I think that is a testament to BOEM's process and really a lot of the feedback that went through the interagency consultation, the taskforce, and the feedback with cooperating agencies as well, and so we're pretty fortunate, and we're quite a ways offshore, which obviously makes it a little bit of a challenge, but it's certainly well sited, and I think we're fortunate, as a developer, to have that going for us.

MR. ROBBINS: Just to follow-up, the project is very well sited, and impacts are best avoided, rather than mitigated, and, like Brian said, we're in a very fortunate position, as a result of the good process, but I do think it's going to create some significant recreational fishing opportunities, as you pointed out, for some of those species on a seasonal basis, and so I look forward, with some excitement, to thinking about how to monitor that and make sure that we're in a good position to understand that, as far as whatever changes there may be in the area, but I think, for both the fleet out of Oregon Inlet and the fleet out of Virginia Beach, it will be a good opportunity.

MS. DEATON: Also, that oral history of the fishing activity, where and when, I think that's really valuable, and I don't know if that's something that could be shared with North Carolina's Marine Fisheries or anybody, but that's really good to have.

MR. ROBBINS: I appreciate that, and, to me, that's been the most rewarding part of working on the project, and I think that data will probably have to be synthesized, in order to be shared, because it gets into detailed information about who fishes where, but, nonetheless, the information about the trends and the evolution of some of these fisheries over history I think can be documented and synthesized in a way that we ought to be able to share.

MR. BENITO: Just to add to that, I can't speak for other projects or other developers, but Rick came to us with this concept of doing these oral histories, and I think it does make us a bit unique in our way that we're engaging with the fisheries, because of Rick's connection and passion for that that process, and so we find ourselves in a really unique situation, with having these fishermen really open up, and Rick is easy to talk to, and he's a trustworthy guy, and so we've got a lot of good stuff, and you're going to see that in our COP. It's something that we've actually added in there and referenced that, and so it makes us a bit unique, and we're certainly happy to have that.

MS. DEATON: I think we've also been talking about the benefits, potential benefits, of wind turbines to recreational and commercial fisheries for a while, and so, when we were talking about compatibility with aquaculture, I think that gets into complications, due to one would exclude the other, in a way, and some of those marine aquaculture facilities have a lot of structure as well, nets and support ships and support pipes, and so entanglement issues I could see between the two, and that could restrict recreational and commercial, and so I agree with what Brian Hooker said earlier of let's just get them going more simply, and not complicate it with that type of co-use, but, the possibility of the environmental data collection, I see that as another win-win. Wilson.

MR. STAPLES: I did want to just point out that we've had multiple meetings with them, and with Rick as well, and so they're certainly aware of what we've been doing, and correct me if I'm wrong, but we provided them with a very similar slide, and we've got a lot of our data, obviously, coming out of them, and so I just wanted to make you aware of that.

MS. DEATON: You probably worked with Alan Bianchi, who is on the call.

MR. ROBBINS: He's been helpful with the fisheries data as well.

MS. DEATON: Great. Wilson, go ahead.

DR. LANEY: Thanks, Anne. I was just going to tell Rick that I'm anticipating a Rick Robbins book, Rick, on the fishing history of that area out there. It sounds like you've got enough information, through all those oral histories, and through all the data compilation you've done, that tremendous job, and it would be really interesting to see that history written down, and fish books are really popular, and so I'm going to be -- I will be harassing you about writing the book.

MR. ROBBINS: I would like to keep going, Wilson. I would. I mean, it's a fascinating history, and the neat thing about talking to those trawl boat captains especially is almost all of them -- Their fathers were trawl boat captains, and some of them their grandfathers were, and these guys started fishing in the 1970s, or the 1960s, and, when they talk about the history of the area, they incorporate, by reference, the history of their fathers and their grandfathers, and it's fascinating. It's a timeframe that is well beyond what managers typically think about.

A lot of times, we look at the last ten years of data, and, when these guys talk, they're talking about their history, and their father's history, and they will tell you about who did what in the 1930s, when there was a fleet of boats down here from Gloucester, and so I love the conversations, but you're right, and I would love to hit you all with that.

MS. DEATON: Okay. Well, I don't see any other questions, and so thank you again for coming and sharing that update with us, all of you. I think, before we start the next presentation, and that's on the Southeast Connectivity and Adaptation Strategy, or SECAS, I believe we should take a short break, and so how about we take a ten-minute break and come back, and it's 10:24, and we'll come back at 10:35.

MR. BENITO: Thank you for having us. It was nice chatting with you all. Have a good day.

(Whereupon, a recess was taken.)

MS. DEATON: I'm going to turn it over to you both, and I think Mallory is doing it, or starting it, and this is about the Southeast Conservation Adaptation Strategy, and, yesterday, we heard from Rua Mordecai on the Southeast Blueprint, and so it will be interesting to hear about those how are the same, or how they interweave, I think for folks on the phone. Go ahead.

MR. MARTIN: I am glad to kick off, and, again, I'm Mallory Martin, and I'm with the Fish and Wildlife Service, and I'm the coordinator for the Southeast Conservation and Adaptation Strategy. I think there's a little bit of maybe a typo in the agenda that spoke to that name, but the acronym is SECAS, and you've got the name up there, and, if you look us up, that will get you to the right place.

In terms of my background, and Roger spoke to a little bit that, as the coordinator for SECAS, I'm coming through a little bit of an evolution, and, prior to this role, I was the coordinator for the South Atlantic Landscape Conservation Cooperative, and, prior to that, I was with the State of North Carolina for a long time, and I had the opportunity to serve as the chair of the steering committee for that South Atlantic Landscape Conservation Cooperative, and so I've had several different hats in the landscape conservation world over the last ten years or so, and, most recently, I'm in what I think is kind of an exciting opportunity that we'll talk about here as we get into it. With me today, and helping me in this, is Hilary Morris, and, Hilary, if you want to do a quick intro, too.

MS. MORRIS: Sure. I've been with -- I started with the South Atlantic LCC full-time in 2014, and, these days, I do user support for both the Southeast Conservation Blueprint and the South Atlantic Conservation Blueprint, which essentially means that I work with folks to help them use the blueprint in their decision-making and to help bring in new funding to support their work, and I use all of the great input and feedback through that process to help improve future iterations of the blueprint, so that it continues to get better and better, based on user feedback, and I'm also the communications lead for the Southeast Conservation Adaptation Strategy.

MR. MARTIN: Thanks, Hilary, and so we're going to hand-off partway through this, and I know that Anne mentioned that you heard from our colleague, Rua Mordecai, earlier in your session, focusing primarily on the Southeast Conservation Blueprint and some of the indicators and some of the marine connections, and I guess some of the updates that are pending, but for today's presentation, I think we're going to zoom-out a little bit and talk more about the partnership, and then we will get into the blueprint a little bit, and Hilary is going to dig in a little bit deeper on how some of our partners are using the blueprint to help inform their conservation decisions.

With that, we'll jump right in. The SECAS itself is a regional conservation initiative, and it covers this geography that's outlined here on the graphic, which is the geography of the Southeastern Association of Fish and Wildlife Agencies, and that's the fifteen states in the Southeast and two territories in the Caribbean, and that also includes, as you will notice, the Exclusive Economic Zone waters off the Atlantic and off the Gulf coast, off the west coast of Florida, and so operating at this huge geographic scale, in common with the Southeastern Association of Fish and Wildlife Agencies.

Why are we concerned at this type of scale? I think there's general recognition now of the challenges that are confronting fisheries and wildlife management and natural resource management in general, and they require that kind of landscape-scale response, and it wasn't always recognized, but I think that's broadly accepted now, that we're operating at a scale that really matches the challenge, and, also, within that scale, the reach for collaboration that's required that transitions across different sectors and across public and private and across numerous stakeholders and partners contributing in concert.

Then, finally, an understanding that relying on shared priorities can help us not only guide where to target action, but inform which actions to take to gain efficiency and effectiveness in applying limited resources to conservation results.

SECAS was started back in 2011, again initiated by the state directors of the Southeastern Association, in concert with the Fish and Wildlife Service, and it became, very quickly, a joint effort that involved the Federal Southeast Natural Resources Leaders Group, which is thirteen federal agencies in the Southeast that have natural resource management responsibilities, and, beginning in 2020, it also incorporated representation from a number of conservation non-profits, and so each of these agency and entity organizations shown in the graphic, with their emblems, appoints a designated point of contact to be the representative from their agency to this broader coalition and initiative conducting collaborative work on the landscape.

A little bit of background here. Back in 2011, SECAS began, and that was the time when the Landscape Conservation Cooperatives, or the LCCs, were starting to really have some success as the self-directed somewhat independent partnerships, and SECAS was stood up really to ensure collaboration among those individual sub-regional efforts, and you will see, in the outline of the geography in the graphic, the six LCCs that were operational within that boundary that is encompassed almost exclusively within that boundary of the Southeastern Association and then to do that all while honoring the fact and respecting the different responsibilities and authorities and mandates that these state and federal and NGO partners all bring to the table.

Kind of a general wrap-up here, SECAS, as this regional conservation initiative, provides a regional focus for conservation investments at this broad diversity of participants. The work for the initiative is done through these designated points of contact, as well as the SECAS staff, and that's Hilary and Rua and myself and about fifteen other SECAS staff that are represented across the entire Southeast, as well as the agency staff and the organization representatives from those individual entities that have point-of-contact representation.

Then, increasingly, we're working through that Southeast Association and their designated committee, like the Wildlife Diversity Committee, which is very active in understanding and promoting at-risk species conservation, and then the way that SECAS delivers value to the partners

is in a couple of really overarching ways. One is as a collaboration forum, a place to come together and identify priority actions and understanding common information and science needs, as well as a delivery hub, an information hub, for delivering that science and helping to support decision-making related to conservation.

With all of that background, what is it that SECAS does, and it's kind of a simple question, and the answer is a little bit nuanced, but, basically, we use a bold vision and ambitious goal that helps to drive action that delivers its impact using a set of tools, including the Southeast Conservation Blueprint, to help clear barriers to cross-state and cross-jurisdictional collaboration for conservation accomplishment.

I mentioned the vision, and it's this aspirational statement that speaks to a connected network of lands and waters that supports thriving fish and wildlife populations and improves quality of life for people, and, as that aspirational kind of visionary, far-looking statement, it recognizes both that geographic scale across the fifteen states, the two territories, the marine waters, as well as the comprehensive scope of the challenges, and that includes connecting the lands and waters and connecting wildlife and people, representing those challenges that are present for conservation both now and into the future.

The SECAS goal that complements that vision was adopted by the Southeastern Association in 2018, and it speaks to what SECAS really intends to accomplish, and that is a 10 percent or greater improvement in the health, function, and connectivity of southeastern ecosystems by 2060, and, again, it's one of those far-reaching statements that is not only an ambitious type of goal, but it's also achievable, and similar in the magnitude of what it's calling for, in terms of ecosystem improvements, to what has been achieved in the Chesapeake Bay region, for example, over a three-decade kind of vision of improvement there.

The goal is supported by near-term metrics the call for 1 percent improvement every four years, and that's what is needed to kind of stay on track to meet that overarching goal, and the near-term progress is measured by using data from a number of southeast-wide monitoring efforts, like the National Rivers and Streams Assessment, State of the Birds, Coastal Condition Report, and a number of others that provide that ongoing monitoring and progress tracking, so that there's not a new kind of monitoring effort that's required to track progress, utilizing those existing efforts that are regularly updated and provide that ongoing trend measurement.

In tracking progress toward that goal, beginning in 2020, we released the second assessment of the SECAS 10 percent goal, through what's called the goal report, and I think there's a link to that either in your agenda or in your webinar materials, but that goal report will show how information is used from these existing monitoring programs and other ecological assessments to provide the common metrics, baselines, and trend information, and the intent here is to update this annually, and the basic use there is to facilitate discussion around what conservation actions are really critical to meet the overarching goal.

This graphic shows a summary of the goal report that shows the different ecosystems on that far-left column, pine and prairie and upland forest and so forth, and then the indicators of those ecosystem conditions are just to the right of that. In pine and prairie, it's prescribed fire in longleaf, for example, and so forth down the line, and then this sliding scale of red, yellow, and green that shows where the indicator currently is in regard to reaching that 1 percent improvement over four

years, and so, for example, in prescribed fire, the indicator is well on its way to reach that 1 percent goal every four years, and, in fact, exceeding that, at greater than 2 percent.

Conversely, in the pine and prairie ecosystem, that pine and prairie bird indicator is one that's really falling short, and so it gives a really quick overview of where resources might be allocated to have a greater impact at attempting to meet this overarching goal.

Moving on to the blueprint, and this is the primary product of SECAS, the Southeast Conservation Blueprint, and it's now in a 2020 version, and I think that's our fifth version since we started this process. The blueprint, overall, it's a living spatial plan that identifies potential areas for a range of conservation actions, which can include management actions, but also economic incentives, protection, restoration, and acquisition, and the dark blue on the map here indicates those areas of high conservation value most important for ecosystem health, function, and connectivity, while the lighter blue areas are also important, but they might benefit from restoration, but they also contribute to buffering those high-value areas and providing connectivity among all those high-value areas.

The blueprint is built by pulling together a number of smaller sub-regional plans, and you can see the color-coding here of the number of different plans that are integrated across the entire fifteen-state region, using a consistent set of mapping steps and integration processes, and it's those consistent processes that combine these sub-regional plans that help the blueprint provide a regional perspective to local decisions, and, as this living spatial plan, it's a work in progress as well, and it's regularly updated, on an annual update cycle, which allows that to incorporate new data as well as incorporating partner and user feedback and their input, and then combining that with specific information about on-the-ground conditions to help make this more applicable and really occupying that continual update process kind of an approach.

The blueprint also contains a list of known issues, where we document some of those areas where it doesn't work quite as well, or some of those features that aren't displaying quite properly and can be updated and addressed for improvement in the future.

Who is using this blueprint? Well, currently, more than 200 different people from ninety different organizations have used or are using the blueprint, and you can see the breakdown there. There's considerable use among non-profits, as well as state and federal groups, but interestingly to us is the number of private businesses, as well as the scale of interest there, from federal down to even local and some of the sub-regional applications. I'm going to turn it over to Hilary now to dig into some of these uses a little bit and give you an idea of people are using this and how that feedback is being applied.

MS. MORRIS: Thanks, Mallory. With that slide that Mallory just showed -- Obviously, I don't have time to talk about all of those great examples today about how folks are using the blueprint, but I do want to give a few examples, just to give you a sense of how SECAS's products make a difference on the ground and how the blueprint is being used, and I'm just going to pick a couple of examples today, and I will start on the coast and sort of move gradually upstream.

Several different state wildlife management agencies in the South Atlantic region have been using the blueprint to support their proposals for National Coastal Wetlands Grant Program funding, and, so far, the blueprint has informed ten successful applications from Georgia DNR, South

Carolina DNR, and the North Carolina Wildlife Resources Commission. These have been really amazing projects, and we're just thrilled that the blueprint could play any sort of role in helping these organizations move their excellent work forward.

The blueprint was used to help strengthen these proposals in a few ways, and the blueprint priorities can really help reinforce the conservation value of the parcels that are being acquired, and the indicators can help tell a compelling story about the natural and the cultural resources that make each of these sites unique. In several of these proposals, the blueprint was used to bring in some threat projections, to demonstrate the urgency of conservation action in these areas and to connect the proposed acquisitions to a larger adaptation strategy and say, hey, this isn't just important at the scale of Georgia, and this is important at the scale of the whole southeast U.S.

The blueprint, also, because of its broad involvement from lots and lots of different organizations, can help show, in these proposals, how this application fits into a shared plan and how it contributes to partner conservation efforts, and so, so far, these ten different applications have brought in over $9 million to secure more than 13,000 acres and restore 3,500 acres, and some of these properties have been really amazing from a fisheries perspective. One example, Altamaha Connector in Georgia, has some critical nursery habitat for estuarine-dependent fish. In the delta, the lower Altamaha River, which is, obviously, a really amazing river, with its intact connectivity and lack of dams, and so, again, we're just really happy that the blueprint was able to help advance this great work from our state wildlife agency partners.

Moving upstream a little bit, the blueprint isn't just used to support grant applications, but also to prioritize where to work and to identify conservation priorities for various different organizations, and one of the most exciting blueprint uses we've worked on lately is through the South Carolina chapter of the Nature Conservancy. They were looking to update their statewide conservation vision, which is essentially a map of their conservation priorities in South Carolina, not just for their internal use, but also as a resource for partners to collaborate around, and the original vision was released in 1998, and so it was due for an update, to take into account the big advances in GIS that had happened in the last twenty years, in terms of mapping, biodiversity hotpots, and wildlife corridors.

They approached SECAS for help in anchoring their updated vision around the Southeast Blueprint, and I think this really kind of helps speak to the niche of SECAS and the niche of the Southeast Blueprint in stitching together these underlying sub-regional plans into a consistent map that spans state boundaries, because the underlying plans of the Southeast Blueprint, the South Atlantic Blueprint, and the Appalachian, neither of those cover the entire state of South Carolina, and so they really needed the Southeast Blueprint to perform that integration and be able to get to a plan that covered their whole area of interest.

TNC wanted to focus just on the larger chunks of priority within the blueprint in South Carolina, just those contiguous corridors of priority and filter out some of the speckles, and that's a classic thing that we do in user support, is helping people find their unique piece of this larger plan, what's the part of the blueprint that best aligns with their vision and goals, and so we were able to work with TNC to do that, and then, also, bring in some additional data that was capturing areas that weren't a priority in the blueprint, and so these pink pixels on this map, these additional resilience areas, these were places that were part of Nature Conservancy's resilient sites analysis that weren't captured as a priority in the blueprint, and they wanted to depict those in their vision as well, and

this is another example of the type of work that user support does, where we don't accept the blueprint as-is to meet everybody's needs.

Often, like I said, we'll need to filter it down and find the pieces of the blueprint that most align with someone's mission, and, often, we'll need to bring in complementary local data as well, and that's something that the blueprint is definitely intended to do, is be used in conjunction with other data and local knowledge and not necessarily be the one plan to rule them all.

Right away, TNC was able to use this updated vision, with the blueprint, to support the successful reauthorization of the South Carolina Conservation Bank, which is a major funding source, and it's kind of a state agency that is supported by the State Carolina state legislature, and it has a strong emphasis on land conservation to improve quality of life for state residents, and, according to TNC, this reauthorization was a little bit up in the air.

There was a perception by some legislators that the conservation community can't agree on what the most important projects are, and, if you ask three different folks, you're going to get three different answers about what the highest priorities are, and so the blueprint was able to help combat that perception and communicate to legislators that, hey, the conservation community has come together around a shared plan, and here it is, and we do implement projects strategically, and it illustrated how, by using a data-driven conservation plan, based on these indicators, we can ensure that funding is targeted in a rigorous way and that government funding is spent really transparently.

Now fast-forward past the reauthorization of the bank, and the bank is embarking on its own prioritization process, and they have included the blueprint as one of their ecological conservation priorities, where, again, the blueprint is going to be used in conjunction with lots of other complementary datasets on quail and threatened and endangered species and climate resilience and battlefields and all this other good stuff, to create a priority map for where Conservation Bank funds are going to be spent.

Now, to bring this all the way full circle, the Conservation Bank is now using its process of allocating funding to protect priority tracts, and David Bishop, our user with the Nature Conservancy, who initially reached out for help with the conservation vision, he went after several sources of funding, and he secured what ended up being the largest conservation easement in the history of South Carolina, which is the Groton Plantation, and he ended up getting $500,000 from the very first NFWF Acres for America Grant that was ever awarded in South Carolina and another $850,000 from, as you probably guessed, the South Carolina Conservation Bank.

We provided maps and analysis of the blueprint to strengthen these grant applications, and this is just, as an aside, an unbelievably cool tract, and it connects 125,000 acres of protected land that span both sides of the Savannah River, and this creates a cross-state wildlife corridor that allows various critters to roam for fifty miles without ever leaving protected lands, and they have the largest population of RCW on private lands in South Carolina, and it has gopher tortoise, and lots of game species, like turkey and quail, and so this is another one where TNC was just doing amazing work, and we were so happy that the blueprint was able to help strengthen their application and clear some barriers for them.

When I reached out to our user, to check on the status of this use case, David gave us this great testimonial, totally unprompted, and, whenever possible, I love to have our users speak to the

blueprint value in their own words, and so he said that the Conservation Bank called out the application for the Groton project as one of the best they've ever seen, which I think is at least partly the result of your data and document. I think it, meaning user support, is a very valuable service, and it absolutely helped us get money, and so that was really great to hear.

This is a case where the blueprint was really used at every stage, in TNC's vision, to help get the bank to authorize it, to help guide where those funds got spent, and now to help partners actually secure funds from the bank to go forth and do amazing things, and so I really love this story, because I think it shows how the blueprint can help organizations collaborate more effectively with partners, and it shows how the blueprint can help the conservation community speak with one voice, and it shows how the blueprint, as a cross-boundary plan, can fill a unique niche, by providing state-wide and regional coverage to the scales of decisions, and so I always like to highlight this one.

Then I will just wrap-up with one more story about how local counties and municipalities have been increasingly using the blueprint in their comprehensive plans and other planning documents, which is something I am very excited about, just because I think there's so much potential here in shaping how cities and towns grow, with an eye toward conservation, and, when I look at those big scary maps of the southeast megalopolis, and what a big threat urbanization is in our area, it's also just such an opportunity to really work at the local level and get involved with how that growth happens and maybe being able to create a little bit of a less-scary map into the future, where we see that ecologically-connected network and not just created cities that have created one mega-city down I-85.

We have been working, in particular, with the Catawba Council of Government in upstate South Carolina, who has been helping various cities and counties in the upstate to update their comprehensive plans, and so the town of Fort Mill used the blueprint to help identify their natural resource priorities, which will help guide efforts to conserve key habitat and expand other recreational opportunities, inform future land use planning, mitigate the impacts of development, all sorts of good stuff, and so the blueprint and underlying indicators also helped recommend, in the comprehensive plan, particular conservation actions that should be done within these habitat cores, such as promoting connectivity, restoring plants and pollinators, controlling invasive species, restoring recurring buffers, and removing aquatic barriers.

Just some of the things that blueprint was able to bring to the Town of Fort Mill comprehensive plan, and we're continuing this collaboration with the Catawba Council of Government, and they are using the blueprint in four different other plans that are kind of working their way through various stages of approval by their local planning bodies and governments.

I wanted to share just a couple of quick additional examples, just to show the variety of issues that the blueprint has helped with, and we have been working in Tennessee, South Carolina, and North Carolina to help connect state wildlife action plans to forest actions plans, by incorporating the blueprint as a common dataset and helping these state agencies better coordinate.

Three different longleaf plan local implementation teams in Mississippi, Alabama, Georgia, and South Carolina have used the blueprint to help identify their conservation and restoration priorities and to support data compatibility across the longleaf range. A couple of states within the Army Corps' South Atlantic Coastal Study have used the blueprint to identify their priority

environmental areas that are at risk of an inundation, and this wasn't where the blueprint was used across-the-board in this whole aspect of the South Atlantic coastal study, but South Carolina and Georgia did use the blueprint to help identify those priority environmental areas.

One group that we work with a lot is the U.S. Forest Service, particularly at Francis Marion and Sumpter National Forest, and they have used the blueprint to inform what's called their land ownership adjustment strategy, which is a partner-driven plan that identifies the Forest Service's restoration and protection priorities, and they have used the blueprint, since then, not only in the strategy itself, but to enhance several different applications for land/water conservation fund dollars that are helping them acquire priority parcels to begin implementing that strategy, and I believe we've helped the Forest Service bring in over $5 million, at this point, from LWCF.

Lastly, we've been working with the National Parks Service, and this is a more recent one, on the Ocmulgee River special resource study, to identify and assess priority resources within the Ocmulgee River corridor, using the blueprint, and there is actually interest from the Parks Service team in assessing the corridor, not just resource-by-resource, as kind of the Parks Service framework for national significance is often set up, but starting to look at the corridor more holistically as a habitat corridor and assessing it sort of from that landscape scale, and so that's a little bit of an exciting new frontier from the Parks Service, and we're really excited that the blueprint may be able to play a role in that, moving forward. That's it for me, and I think I will hand it back over to Malory to wrap-up with some future directions for SECAS.

MR. MARTIN: Thanks for that, Hillary, and just to reinforce, a little bit, that the scope and scale of all those use cases really varies, from local all the way up to regional, and that's just really a huge overview of the depth and detail of that kind of those many, many awesome use cases.

I want to zoom back out, at this point, and kind of talk about future directions for the partnership, and I will mention a couple of things, really quickly. One is that, last year, we completed a study that was called the SECAS Futures Project that was taking a holistic look and an evaluation of the organization and the governance and how SECAS delivers value, and it came up with a couple of recommendations specific for helping refine SECAS as a partnership and as an initiative in helping to move that forward and sustain that value delivery.

One of those was recommending to continue the coordination and the investment in people, products, and services, which has really been questionable as to how to support that funding and how to support continuity and the capacity and continuation for us to be able to continue building the blueprint and refining the application of that, and, in addition to that recommendation, the study really recommends deepening and broadening the engagement, and so looking to involve more participants, more partners, looking to incorporate really and cast a wider net to the number of organizations and participants in the planning and the delivery of the products and services that SECAS provides.

One other thing that I will mention that came out of the study was a recommendation to conduct a social network analysis, and we're really excited about the potential for this, and it's the kind of study that would help us understand and realize better the connections and the relationships that exist within the networks among conservation practitioners across the entire southeast.

There are hundreds of those efforts that are underway, and there is opportunity to leverage one another and to ensure that individual actions are complementary to the directions of the whole, and I think one of the interesting applications of this social network analysis could be to integrate that kind of social and organizational data with the biological data and the biophysical data in the blueprint itself, to help create a partnership atlas that could point to individual organizations who are active in certain areas, but there may be some of those high-conservation-value areas that really don't have a whole lot of attention and operational -- Receiving operational interest.

We're really excited about that, and we're looking forward to initiating that particular social network analysis this year, and then the final piece that I will mention is in regard to the Thirty-by-Thirty national goal that was announced by the Biden administration back in January, which, again, is intended to conserve 30 percent of the nation's lands and waters by the year 2030, and one of the obvious questions about that is, well, where do you start, and which lands, what to conserve, and there are a number of questions around how to implement that.

We feel like the SECAS and the Southeast Blueprint can provide a great foundation to begin to have those conversations about what to include and where are we now and what are the starting points, and then providing the basis to sort of link state and federal and non-governmental organizations, private land owners, and businesses, to foster some engagement along that diversity of participation.

In that regard, we're working, currently, to develop a symposium that will be hosted, and we hope that it will be accepted for presentation, at the Southeastern Association annual conference, which is in October of this year in Roanoke, and so I would like for you all to be aware of that and put that on your calendars, if that's a place that you normally attend, and I look forward to continuing these conservation conversations about the Thirty-by-Thirty national goal. With that, I think we have time for a couple of questions, and thanks to Hillary for supporting me on this, and I think we will try to answer questions, if there are any.

MS. DEATON: Thank you, Malory and Hillary. What seems to be really excellent about this project and the tool is that customer service that helps others use it, and so there's a lot of tools out there, but I think you guys do a great job in helping people use it along the way.

MS. MORRIS: I'm definitely glad to hear that that came through. It's a huge part of what we do, a huge part of how we're staffed, to really provide that support, and I know that, in working with people over the years, sometimes that's a hard myth to get through, and it's like, no, literally that's the point of my job, is to help, and it's not a burden, and that's why we're here, and so I'm definitely glad that that message came through loud and clear, and I hope that, if any of you in your work, either with the council or for your individual organizations, feel that the blueprint could help, I hope that you will reach out to us, and we would be thrilled to work with you one-on-one.

MS. DEATON: Absolutely, and I know that, because it's such a large area, and a lot of your focus is inland, and we are coastal, that limits -- The coastal-draining rivers can go quite a ways inland, and can have a great influence on water quality and habitats downstream, and so conservation of those upper areas is just as important, or more important, than looking at the immediate coastal zone.

MR. MARTIN: Definitely, and making those connections and working across those different ecosystems really is what we see as the value of the blueprint, in being able to connect those different areas.

MS. DEATON: I don't see anybody else. Nobody has raised their hand. Does anybody have any comments or questions? Trish.

MS. MURPHEY: Wilson maybe can pipe in on this too, but I actually was pretty fascinated by this partnership and how this -- Your SECAS, and, anyway, I was fascinated by the fact that it's such a huge area that you cover, and who I work with, the Albemarle-Pamlico National Estuary Partnership, which is an NEP, we kind of have a similar -- We have a large area, and it's not just coastal, and I was actually thinking that my group and your group might be able to form a really nice partnership, and so thank you for your presentation.

MR. MARTIN: We are very well aware of APNEP, and engaged with them, and I think that Rua is actually a standing member on their technical committee, and they have been incorporated in our user support efforts and our workshops, and they have provided lots of input into various iterations of the blueprint, and we have worked with their staff quite a bit, and we're well versed with APNEP, and so thanks for that.

MS. MORRIS: Certainly, Trish, if you see opportunities to deepen that engagement and take that in a new direction, we would be super thrilled to work on that with you.

MS. MURPHEY: Okay. Yes, that would be great. Thanks again for your presentation, and I just saw a lot of parallels.

MS. DEATON: Wilson, go ahead.

DR. LANEY: Trish is absolutely right, and Malory and Hillary are absolutely right. APNEP and the South Atlantic LCC, prior to the greater SECAS engagement, were working very closely together, and Louise Vaughn, in particular, worked with us, and, Trish, we put together a presentation for Wake County Open Space and Parks Program, to show them how they could make a difference at the APNEP level and at the South Atlantic LCC level and at the service's ecosystem team level.

We had four different ongoing conservation initiatives there, at four different levels in the landscape, and so we put together a presentation for them, and Dean Carpenter was involved, and Louise came over from the South Atlantic LCC, and, of course, we did it for the Open Space and Parks Advisory Committee, and so I agree with you, and I think there's tremendous additional potential for programs like the Wake County Open Space Program and for every county, and I'm encouraged to hear from Hillary about the work that they're doing with South Carolina in updating those land use plans, and I think that's a -- I mean, the whole blueprint is a tremendous tool for helping those local communities and municipalities to consider natural resources and connectivity during their planning processes.

We're so very fortunate, here in North Carolina, and both Mecklenburg and Wake Counties have these pretty well funded open space programs, and a lot of the less-urban counties don't have those sort of programs, but some of them at least do have some sort of land use planning component,

and I think that's where the blueprint can make a huge difference, and then Hillary also mentioned those coastal wetland grants.

Mike Wicker, who is our Coastal Program Coordinator within the Ecological Services Program here in Raleigh, and I have collaborated with Susan Shipman in Georgia and Steve Gilbert and others in South Carolina and then the North Carolina Wildlife Resources Commission in helping to enhance the fisheries portions of those grant applications, and I think we've been pretty successful.

We can't claim the credit for getting those funded, because the people who do the work in the states, who prepare the proposals, deserve the lion's share of that, but it's just extremely gratifying to see that almost nine-and-a-half-million dollars and 13,500 or so acres of habitat has been put into permanent conservation as a result of the collaboration, and, again, a lot of it, or some measure of it, is attributable to the fact that the blueprint laid the foundation and did all the groundwork for showing how important those areas were and what sort of connectivity benefits there are.

I have been sold on the program since day-one, actually way back in 1994, when the Fish and Wildlife Service started trying to things on an ecosystem basis, and I do have a question in here, Malory, and the question is whether or not you all are feeling more support and endorsement, and I know you've gotten a strong buy-in and endorsement from all the states, but are we seeing a good bit more endorsement and buy-in now under this administration than under the previous one?

MR. MARTIN: The quick answer to that, Wilson, is I am definitely optimistic about the future of these broad landscape conservation kinds of partnerships, and SECAS, in particular, really has some momentum behind it right now. In fact, with this Thirty-by-Thirty national goal, SECAS is being viewed as a model for -- As a national model to help implement that kind of goal broadly across the country.

In fact, I am just looking at some emails calling for an important presentation to leadership today on SECAS, and so there are lots of opportunities out there, and SECAS is providing a model for that, and so I am really super optimistic, and, really quickly, in terms of organization, just in the last month, there was a movement made in official business from the Southeastern Association of Fish and Wildlife Agencies to stand up SECAS as an official executive committee of that Southeastern Association, and so we have a standing steering committee, and it comprises five state agency directors, as well as the regional director of the Fish and Wildlife Service, who provide the oversight and strategic direction to this initiative now, and so we've got some standing leadership, some pretty powerful interest behind where this is moving, and I am really optimistic about our potential and our ability to continue.

DR. LANEY: That's great to hear.

MR. MARTIN: The applicability of the blueprint and the other tools at bringing people together and demonstrating that value.

MS. DEATON: Thank you, Malory, and, with the push in North Carolina for coastal resilience, and seeing already impacts from climate change, there is some funding available, through the NCORP program, to assist coastal communities to adapt and to become more resilient, and that includes land acquisition, and we have talked a lot, through the efforts of the Coastal Habitat

Protection Plan, which we're updating right now, on the need to conserve marsh migration corridors.

I feel like this would be a great connection, and I don't know if you are connected with that NCORP project, or there is staff under the Division of Coastal Management that are distributing grants, and local governments can submit grant applications, and we work closely with the local governments to help them implement changes.

MR. MARTIN: Actually, one connection that is really starting to get traction is through the SERPPAS, through the Southeast Regional Partnership for Planning and Sustainability, which is affiliated primarily with military installations and their operational capacity, but, also, looking beyond that to communities and to areas of interest that relate to military installations.

One of the projects that's being stood up by the SERPPAS Coastal Resilience Working Group involves an evaluation by a Pew Oceans to look exactly at saltmarsh migration, and so we met with them last week, and they want to use the blueprint as a foundational element in helping to understand where to target some of their interested activities, and so some of that work is underway, and not specifically with DCM or NCORP, but tangentially through SERPPAS and through their work with the Coastal Resilience Working Group.

MS. DEATON: That's great, and there is already a marsh migration tool that some staff from Duke University have done, and so you might want to look into that, and Katie Warnell was the person that did it, with Lydia Olander, and it might be a good starting point.

MR. MARTIN: Yes, and I think the Pew folks are aware of that, and we actually talked about that when we met with them earlier, and so I think there's lots of opportunities to intersect around all of this and to make sure that the data and the tools that are out there are really complementary and are supporting one another and adding up in ways that help to leverage.

MS. MORRIS: That's interesting that you mention the ecosystems services shop with the Nicholas Institute, and we just used some of Katie and Lydia's data on equitable access to potential parks in an improvement to our urban open space indicator this year, and their data is doing a really great job of capturing the number of people who would be served by the creation of new parks, who currently are kind of located in park deserts, and so there's a lot of amazing data coming out of that shop, and I wasn't aware of the marsh migration thing, and it sounds like the Pew folks were, but thank you for bringing that up.

MS. DEATON: They have a whole story map of several things they did as part of the Map of Working Lands Committee, which was a committee as part of that statewide coastal climate risk assessment and resilience plan. I can send you the link.

MR. MARTIN: Yes, please do. Thanks.

MS. DEATON: All right. Well, thank you very much. I don't think there are any more questions or comments, unless, Roger, did you have anything?

MR. PUGLIESE: Let me just jump in for a couple of -- Thank you, Malory and Hillary. I really appreciate the update and the advancement, and I see -- It's great to see this thing go as far as it

has now, with some of the roots back in our deliberations on the LCC, some of the original conservation blueprint, coming up with developing corridors and understanding the connectivity from all the way inland areas to the coast and offshore.

Also, the fact that a lot of the -- With some of the activities advancing now on some of the change and habitats that are designated essential habitat components, I think it's going to be really an opportunity to build from a lot of the information that was provided in the past, through either our partners or through the council, through some of the different spatial information on distributions of habitats or species that got integrated in a lot of that first level blueprint area, and there may be a way to enhance and expand, based on additional offshore research and mapping and other information that has come to bear since the inception, or the integration.

Some things are already -- I see we're advancing with work that Rua is doing, and I think it's cross-walking between the different blueprints, in terms of other model information, but then also newer information, and so I think it was really important to highlight this as an opportunity, and that was the one thing that we wanted to do, is to see where partners, our states and agencies and other partners that are on the panel, as well as supporting through the council, have the ability to connect in or advance some of these things.

Some of the work being done on indicators and the states of the systems, I think also those are things that are potentially also addressed under our broader ecosystem plan, and it's being done through other organizations and other coordination efforts, and I think being able to go to somewhere where a lot of that is in one place is going to be important to, again, expand the understanding and connections and implications for either council-managed species, prey, habitats, or flows in the river systems that may be affected, and I appreciate all the work and the effort, and it's come a long way.

MS. MORRIS: Thanks. You're a big part of it, Roger, and we appreciate you having us today.

MR. PUGLIESE: It's great to see the ocean side still, and that was the one question, is, as this evolves, is it going to stay, and I think that was the only way to really truly have that full connection, which I think you've done, and you've expanded the Gulf, and the biggest footprint for the whole Southeast Association is excellent.

MS. DEATON: I agree. You've got to include the ocean, right? All right then. Thank you very much. We'll move on to our next agenda item, and so this will be the last thing on the agenda for today, and it is an update on Council Coordinating Committee Habitat Workgroup Activities. Roger is going to provide that update, and so I will turn it over to you.

MR. PUGLIESE: It's just going to be a verbal, and I have highlighted some of these in the past, and things are being developed under the Council Coordinating Committee, the Habitat Workgroup that I serve on, that connects all of the habitat activities from all of the councils, and it's looking at specific focuses for this year, and we're working on a number of pretty critical activities.

One I think I've highlighted in the past is the opportunity to enhance coordination with the Science Centers throughout the country, from the national and then really filtering down to the regional basis, to focus on habitat, on what they're doing for habitat, and how to expand that, and I think

that's going to be really important as we go into the future, especially as we're developing the council's blueprint and some guidance on expanded coordination, to be able to make sure that some of the research, some of the connections, are really advancing and are available to provide refined information on EFH and information needed to understand the threats and impacts and meet the council's needs in the long term, and so those are ongoing.

One of the other aspects is a real focus on the impacts of offshore structures, with the most significant focus being a wind group has been created to do a couple of things, and this is going to be brought forward to the CCC for consideration, and one is be able to provide a view of how some of the analysis and different things have been done to go from concept to actually the establishment of the lease areas, and that happened as an information for the different regions that are just getting into addressing wind.

The other one was potential for a best management practices document, or guidance information, that can be drawn from a lot of the research and work that's been done in the Northeast, but I think my biggest goal there is to engage our partners with BOEM and the individuals, especially with the analysis done from the beginning to where we are with Kitty Hawk Wind, to really show how, if you work through all those, some of those types of guidance really provide kind of the longer-term focus and ability to advance that, as well as, in our region very specifically, opportunities and the potential for platforms, from everything from monitoring to exploration has been raised.

I think that's going to be a really critical effort that happens, and I raised it when we were discussing the blueprint, or not the blueprint, but the Fishery Ecosystem Plan, some of the priorities for the next year-and-a-half. As that comes forward, that can be something that could get integrated directly into -- If the council directs an update on say the energy policy, to address that and integrate and highlight some of those very important aspects of preplanning, all the way to where things are and where they go into the future.

Those were just some key areas that I wanted to highlight for the panel and things to be developed, and we'll keep everyone informed as they continue to evolve and then how that connects into the charges to the panel on future policy development or information needs or research or guidance for EFH into the future. That's really all I wanted to do, is touch base on where we are with some of those activities, and we literally are going to be having some meetings and kicking off some of those efforts. We've already kicked them off, but they're going to be actually getting a little more focused after the upcoming CCC meeting itself. Any questions?

MS. DEATON: Wilson has a question. Go ahead.

DR. LANEY: Thank you, Anne. Roger, I was just going to ask you when the next meeting is, and are the CCC meetings via webinar, and so can the public listen in on those?

MR. PUGLIESE: Yes, the CCC meetings are -- That's actually coming up next week, and it's shortly after -- I will send a note out. However, the workgroup will actually be -- Those are separate, and those are just operational working groups, but the official CCC meeting is coming up in -- Let me look. It literally is right around the corner. I think it may be next week or the week after. I will forward that out. It's in May, and that is going to be focused on activities across all the national efforts.

MS. DEATON: It would probably be very interesting to hear what the other councils in different regions of our country are doing. Paula, go ahead.

MS. KEENER: Roger, thank you for that update. Just going back to your comment about the working group that has been formed to deal with the impact of wind structures, thank you, again, for your comment regarding consideration of multiple use for those platforms, and I just wanted to highlight -- I think it was Brian Hooker who pointed out that, the sooner those conversations take place in the process of the development of those platforms, the better.

It's much more difficult to go back, or maybe even impossible to go back, and retrofit some of those platforms for consideration of multiuse purposes, and, also, there is the whole process, as we all know, of getting either categorical exclusions, or whatever the need may be, for placing different types of equipment in the water, and monitoring devices in the water, and so thank you for that.

MR. PUGLIESE: Thank you, Paula. That is really critical, and that's one of the reasons that I had mentioned drawing on some of the efforts in the Southeast, because I think some of the efforts in the Northeast area failed to do an adequate amount of that in the frontend, to be able to make sure that some of the things that were avoided in the Southeast happened, and so I think we don't want to be guiding down a road where some of those are not done, and so definitely.

MS. DEATON: All right. Well, thank you, Roger, for keeping us up-to-date, and that was interesting work. Are there any other items that need to be discussed?

MR. PUGLIESE: Well, the one thing -- Anne, just let me just jump in there quickly. The one thing that I wasn't able to touch on yesterday was, and what I can do is just be fairly quick with it, is the council is moving forward with a redesign of their website and activities, and what I did provide the members was the -- Essentially, it's like the footprint of the existing habitat page and the Fishery Ecosystem Plan Dashboard, because, as you know, that is the Fishery Ecosystem Plan, is the dashboard itself, with the components that are laid out.

DR. LANEY: Anne, while Roger is pulling that up, I will just say that I sat in on one of the AP orientation sessions, and thanks to Kim Iverson and Cameron Rhodes and Julia Byrd, who gave the one that I sat in on, and they do a great job, and they provide a tremendous amount of support for stakeholders and AP members and council members and everybody.

We did touch briefly on the website redesign, and I was somewhat serious when I told them, hey, guys, I have finally figured out where everything is on the website, and so please try and keep it very user friendly, so we can still find stuff once they redesign it, and so I think that's kind of where Roger may be headed, but I certainly use it often, and I think it's a tremendous tool, and the other thing I told them that really rubs me the wrong way is when I hear stakeholders complaining that the council has done something they didn't know about or that they felt like it was being done behind the scenes in the dark.

My response is always, hey, look, if you feel that way, then that tells me you haven't looked at the website lately, because there is so much information there on the website, and all you have to do is find it, and, if you can't find it, the staff is more than willing to help you and tell you where it's

located, and so I think the council has done a phenomenal job in the past, and I look forward to seeing the new site, and I hope it's just as user friendly as the present one is.

MR. PUGLIESE: Thank you, Wilson. I guess we can go to Paula first.

MS. DEATON: Go ahead, Paula.

MS. KEENER: Wilson, thank you. That's a very kind and complimentary comment to the council, and I support that 100 percent. Designing a website is not easy, and so many of the pages overlap, and it's just a lot of work, in just the creation and the design of it, and so I support your comments 100 percent. Thank you.

MR. PUGLIESE: Today, one of the things we want to make sure is that we highlight, as members, use of the habitat and ecosystem section, or the FEP Dashboard, and the value of that to their use, and, as we see here, this is the initial layout. As I said, the FEP II is the online system, and that's the whole actual thing, and there is not a document anymore for the Fishery Ecosystem Plan. Components of those are integrated through this entire effort.

What it is does do is it provides the access to all the information on the South Atlantic ecosystems and the habitats and managed species, and it touches on the social and the economics, and it has the whole dedicated section on essential fish habitat, which includes everything from the information on designations, which is captured in a user guide, which was distributed earlier, and it was actually at the end of last year, the update that we coordinated with the habitat conservation to clarify all the designations under each of the fishery management plans.

It does even provide the access to the connections for the tools, such as what Tina was presenting on the digital dashboard and the web services, and so the way this works is that the front page is the habitat page, and it jumps in and gives you the snapshot and gives you the links, and it does provide the access to the implementation plan and two-year roadmap.

Under these different areas, you get into the foundation of this area, and you get into, as I mentioned, the ecosystem areas, and those have links directly to the specific descriptive sections, as well as policies under climate, as well as the policy under ecosystem, and then the habitats, the overall habitats, are described through both historic information -- Some of the areas didn't change from the original Fishery Ecosystem Plan, and the newest updated versions are also presented in the existing linkage, and so you have the access, as I mentioned, to the policies and to the descriptive information and the implementation plans, and then you get into things such as modeling ecosystem health and climate links, and those need to be updated to expand into the more recent developed and presented regional implementation plans, as well as activities that are going to ultimately happen with regard to climate scenario planning.

The habitats, one of the biggest things that changed, and this is maybe an important thing for the members to weigh-in on, is that it not only presents the information for the Fishery Ecosystem Plan and the information highlighted that supports all the EFH designations and the managed species information, but it also makes the connections back to the individual state either habitat plans or the state wildlife action plans, and so a lot of the information is immediately accessible through the same location, to be able to get to that, plus it provides the connections to either the specific habitat descriptions or even the most recent and updated mapping information, as well as

our partners on a regional basis, with ASMFC and any of the supporting documentation on regionally-based species and habitats.

It also has -- It moves into all managed species, and what this does is it gets into -- There is a dedicated amount of time that provided information directly to access all the managed species and get snapshots of the managed species and then be able to also -- The snapshots and then get into a run of what was put together for the South Atlantic Ecospecies query for that specific species, and so whatever detailed information was available in that system.

Again, for the expanded view of everything, it also does provide access directly to all of the information for our other partners, with ASMFC, with the other councils, where there are species in National Marine Fisheries Service that are overlapping with the area.

Then a snapshot of the economic and social component, the human environment, and what it did is presents the most recent section from an FMP that has that description for the individual fishery management plan, and then this gets to kind of the biggest EFH side of things, with the EFH user guide, and that was updated recently, and the links to the specific plans that the council has for coral, as well as sargassum, and then all the policy statements, the specific policy statements that have been developed, and then the -- Which also presents the opportunity to look at spatial representations of EFH, and then it goes to the linkages, another avenue to get to linkages, for the web services that the council has and the links to species-specific information and the Ecospecies system.

Then links for threats and information on life stage, and there was a dedicated effort, and that is all integrated in Ecospecies, but it does have the use of habitats by life stage, a document presented, as well as integration, and it provides the overview of the managed species areas, linkages directly to snapshots of the areas that are quickly accessible, but then also the detailed information on any of the managed species, as well as an introduction that is a web map that you can see all of those in one context, and Tina got into some of the more real details and some of the newest iterations of those. Then this provided linkages to either coordinates or applications or some of the partners, such as the original conservation blueprint that is out there that was reviewed.

Then, under research and monitoring, it presents the council's priorities, and some of these need to be updated. The most recent SEAMAP five-year planning document will be added in, once it's available to post, and overall efforts on trying to coordinate mapping strategies, and, again, linkages here on all the tools that are presented that Tina had walked through, Tina Udouj walked through, that are under either the digital dashboard or the web mapping.

Today, what we wanted to do is just, as I said, since the council is looking at revisions to the webpage, to get some input on members' use, and I think you have been touching on some of that, but the members' use of these areas and have that type of dialogue on how they are being used or are accessible or ways to enhance it. Are there any questions specific, or comments specific, to opportunities and value of having access to this or the location?

MS. DEATON: Well, I will start, and I think absolutely it's a great resource, especially for anybody doing conservation or management of fishery species. I love referring to other documents with links, because that saves space, and it's more efficient, but it gets that information out there, and I think the maps -- I have used them, and they are very helpful to see the big picture, and I

know that -- I have heard from National Marine Fisheries Service folks that consultants for projects refer to those maps, and that's why they have requested that those be kept up-to-date, so that, when they work on an EIS, or EA, document, that their information is accurate. This is not live yet, correct, this reformatting?

MR. PUGLIESE: This actually is just the existing page, and this is the presentation, and so everything you saw -- You saw it in the form -- This page right here is the real page, and then there are comparable -- What you saw as outlined really has the full pages, and so it's live, and it does have all the pieces that I highlighted in there.

MS. DEATON: Okay. All right. Wilson, go ahead.

DR. LANEY: Thanks, Anne. I just wanted to say that, in addition to the habitat information, one of the things that I find most useful about it is all of the archival information that is there from past council meetings and past AP meetings, and that is just really, really useful. Once they post the transcripts of the meetings, you've got the record right there in front of you, and it's just an extremely valuable reference tool, and so I would hope that a lot of that information remains accessible, and I agree with you that it's so nice, when you are writing technical materials, just to be able to put the link in there to the particular document or council meeting minutes or committee meeting minutes that you want to reference. It's just a great way to do business, and it's much more efficient.

MS. DEATON: Anybody else care to comment and provide some input for Roger? I think the council is looking for input on this. Well, it might be too close to lunch, and a good meeting, and so maybe, if anybody has thoughts that they want to send separately in an email to Roger, that would be absolutely fine. Anything else, Roger?

MR. PUGLIESE: I think that's it for today. I mean, we could have follow-up, and, a lot of times, we've had opportunities to walk through these and use these and get a little more input when we've had the meetings at FWRI, and we've actually had hands-on access to the information systems and highlighting those, but, no, and I think everything has -- All the agenda items are covered.

MS. DEATON: All right. I was thinking about action items for -- If there were any action items, and the only one I can think of is to get the beach nourishment -- The sub-committee together to work on revising that policy, and so someone will be in touch with the people that signed up regarding that, because our goal is to try and have a draft done by the fall meeting.

MR. PUGLIESE: Yes, and I think that will be an opportunity to figure out a way to create maybe some online capability, whether it be a Google doc or something, where the group can coordinate and be able to work on iterative drafts or have access to support documents, a lot of the different things that we've been talking about, about accessing or materials that people have been providing that would help advance the process, and we can make sure they're all in one location too, and that will help advance the process, and we can help facilitate that.

MS. DEATON: Okay. The one last thing I will mention is that, when I became the chair of this advisory panel, it was three years ago, and we said, at that time, we wanted to rotate, so that each of the states gets representation, and it's really helpful, for the council perspective, so that it's not so heavily focused on one state, and each state has unique issues, and so we have set it up to be on

two-year rotation cycles, and the Vice Chair would move into the Chair seat, and so Cindy Cooksey has been serving as Vice Chair, and she has agreed to be the Chair after this meeting.

I know she'll do a great job, and I really appreciate everybody that has helped me be Chair. It's been a great experience, and I will still be on the committee, but I'm going to serve as Vice Chair until we find someone else who is interested in taking over as the Vice Chair, knowing that the Vice Chair will eventually become the Chair, or at least that's our plan, and so think about that, and I guess get in touch with Roger if you're interested, Roger or myself, or Cindy. I mean, if anybody wanted to volunteer right now, they could.

MS. COOKSEY: Anne, I wanted to extend my thanks for your leadership over the past three years, and I have only been on the committee for I think four years, and so I've learned a lot, being able to watch how you have run the committee, the panel, and I look forward to our switch next fall, I guess, and I'm glad that you're going to be my Vice Chair for that first meeting, and hopefully we are going to have someone from one of the other states who might be willing to step up and volunteer to take their place as Vice Chair this time next year, maybe.

MS. DEATON: I'm sure we will, but don't worry. It's really not that hard, Cindy, and you'll do a great job. Okay. Unless there is anything else, Roger, I think we --

MR. PUGLIESE: I would just like to thank you too, and it's been an honor and privilege to work with you to keep a lot of things moving forward, and a lot of things are being passed into Cindy's hands, but you're still going to be second in line, and so you'll be able to keep them moving for the council and keep these -- At a pretty critical time, to keep things advancing. The only other thing I will say is that hopefully we'll be in-person, and we can maybe toast you. We can get together as a group and be able to.

MS. DEATON: Thanks. It's been fun, and it's been really amazing, and I have appreciated the opportunity, but it will be nice to be in person.

MR. PUGLIESE: I guess the last thing would be if there's any other public comment.

MS. DEATON: Is there any public comment?

MR. JONES: I do have a public comment. My public comment really deals with my concern over the proposed Camden Spaceport and the potential environmental disasters with so many rockets failing. The size rockets that they're planning to use has a lot of failure rate, and I was just concerned about that, and addressing the concerns locally, but I wanted to bring that up to the AP.

MS. DEATON: Okay. Thank you, Tom. I don't really know too much about that, the higher rates of failure, and that's what you're mentioning?

MR. JONES: They do have a higher rate of failure on these sized rockets, and these are the size that go off at Cape Canaveral, and these are smaller rockets, satellite rockets, and --

MS. DEATON: They land in the ocean when they crash?

MR. JONES: Well, they crash onsite. They crash within a few miles of the port itself, and the majority of the rockets would be going over our coast, going over Cumberland Island, and they close the fishing area for days or weeks before the rockets go off for fishing, but, if there's a crash, then I'm not clear on what their cleanup protocol is.

MS. DEATON: Well, thank you for making us aware.

MR. PUGLIESE: I think Paul may have a follow-up on that.

MS. DEATON: Go ahead, Paul.

MR. MEDDERS: (Mr. Medders' comment is not audible on the recording.)

MS. DEATON: That was really hard to understand, Paul. Your connection was not clear.

MR. PUGLIESE: I think the key with that whole discussion is that industry is evolving quickly and that there's going to be more activity, and that was one area in Georgia that has been looked at as a spaceport area, and we're going to see probably things ramp up in the future, and so this is going to be a newer issue relative to closures and relative to all types of implications, and so that's a developing issue that is going to be something that I think is going to get highlighted in the future, sooner than later.

MS. DEATON: Gotcha. Emerging issues. Like we didn't have enough.

MR. PUGLIESE: Add it on top. Just a quick note on one other -- Just as information, I mentioned the CCC meeting, and it's actually scheduled for May 18 through 20, and so I will forward a link to AP members.

MS. DEATON: All right. Thank you. Okay. Any other public comment, or any comment? Hearing none -- Is that Paula?

MS. KEENER: I did, and I would just -- Can I comment in public comment?

MS. DEATON: I think we're done with public comment, and so go for it.

MS. KEENER: Every federal agency is covered under NEPA, and so I just wanted to make that statement, or it falls. Not covered, but it falls under the NEPA requirements.

MS. DEATON: Meaning that they would all have to comply with the NEPA before something like this was approved.

MS. KEENER: Correct.

MS. DEATON: Okay. Good to know. Keep a lookout for spaceport applications.

DR. LANEY: Let me ask one clarifying question, Anne. Is that sport port -- I guess Tom can answer this, but is that spaceport that is proposed a federal fall zone, or a federal agency, or is it a private entity?

MR. JONES: It's a private entity.

MS. COOKSEY: But there is a federal nexus, and so it is subject to the full federal review and NEPA policy, and there is an environmental impact statement that has been out for public review, and I don't know if the review period has closed or not, but there is a federal nexus to it, even though it is a local entity that is the applicant.

MS. DEATON: Do you happen to know the name of that, Cindy, so if somebody wanted to find the EIS and possibly review it, if it's not closed yet?

MS. COOKSEY: The Camden Spaceport.

MS. DEATON: Okay. Thank you for providing that information, Cindy.

DR. LANEY: To Tom and Cindy, is this a project that rises to the level where the AP should make a recommendation to the council for weighing-in on it, or has the National Marine Fisheries Service already done so?

MS. COOKSEY: It's gone through an EFH consultation process for the EIS, and it's also gone through, or is still going through, a protected resources ESA review as well.

MS. DEATON: Okay. Any other comments or questions? It seems that NMFS has been involved, and Protected Species of NOAA is involved, and I don't know if the EFH consultation looks at closure -- Is that considered a closure of areas to fishing activities, restricted access?

MS. COOKSEY: So no, and the EFH consultation was focused on EFH impacts, but I am aware of the fact that one of their safety protocols are closures associated with the launch, as the launch goes out over the ocean, and they want to ensure that individuals are protected from any potential accidents, and so it's the FAA is the federal entity, and the permitting dashboard for the federal government has the Camden Spaceport environmental impact statement is available for review, and it has contact information for the FAA's point of contact, Stacey Zee, and it has her contact information, for anyone that is interested in getting more information about the project, status of the environmental review, and there may still be a period of comments that are open, but they would be able to find that out, by primarily just Googling "Camden Spaceport and FAA", and it should take you right to it.

MS. DEATON: Thank you. Thank you for providing that so fast, Cindy. All right. With that, I'm going to adjourn the meeting, and I hope you guys have a wonderful spring and summer, and I will see you in the fall.

MR. PUGLIESE: Thanks, Anne. Thanks, Cindy, and thanks, everybody, for all your input and sticking with this webinar activity effort, and hopefully, as indicated, we'll be in person in the fall, and so I look forward to that. You all take care and stay safe, and thank you again.

(Whereupon, the meeting adjourned on April 16, 2021.)

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Transcribed By
Amanda Thomas
June 28, 2021

Attendee Report: Habitat Protection & Ecosystem-Based

Report Generated:

06/14/2021 05:15 PM EDT

Webinar ID	Actual Start Date/Time	Duration
505-404-003	04/14/2021 12:32 PM EDT	3 hours 52 minutes

Attendee Details

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Yes	Baumstark	René
Yes	Bell	00Mel
Yes	Bianchi	Alan
Yes	Brouwer	01Myra
Yes	Carmichael	01John
Yes	Chaya	Cindy
Yes	Cherubin	Laurent
Yes	Clarke	Lora
Yes	Cooksey	Cindy
Yes	Craig	Kevin
Yes	Crowe	Stacie
Yes	Deaton	Anne
Yes	Foss	Kristin
Yes	Galvez	John
Yes	Glasgow	Dawn
Yes	Glenn	David
Yes	Havel	Lisa
Yes	Hawes	Rachel
Yes	Helies	Frank
Yes	Hooker	Brian
Yes	Iverson	01Kim
Yes	Jaggard	Cameron
Yes	Keener	Paula
Yes	Kellison	Todd
Yes	Kolmos	Kevin
Yes	Kramer	Rob
Yes	Kroenke	Clayr
Yes	Laney	Wison
Yes	Medders	Paul
Yes	Mehta	Nikhil
Yes	Merritt	Rita
Yes	Mordecai	Rua
Yes	Murphey	Trish
Yes	Poland	00Steve

Yes	Rhodes	01Cameron
Yes	Ross	Steve
Yes	Sanchez	Joseph
Yes	Schmidtke	01Michael
Yes	Seward	McLean
Yes	Smart	Tracey
Yes	Snyder	Ashley
Yes	Spooner	Ellen
Yes	Staples	Shane
Yes	Thompson	Thomas
Yes	UDOUJ	TINA
Yes	WEBB	DAVID
Yes	burton	michael
Yes	collier	chip
Yes	ellis	john
Yes	miller	steve

Attendee Report: Habitat Protection & Ecosystem-Based Management

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06/14/2021 04:46 PM EDT

Webinar ID	Actual Start Date/Time	Duration
505-404-003	04/15/2021 08:30 AM EDT	8 hours 47 minutes

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Yes	Cooksey	Cindy
Yes	Crowe	Stacie
Yes	Deaton	Anne
Yes	Galvez	John
Yes	Gentry	Lauren
Yes	Glasgow	Dawn
Yes	Hartzler	Jeff
Yes	Havel	Lisa
Yes	Hawes	Rachel
Yes	Haymans	Doug
Yes	Helies	Frank
Yes	Hooker	Brian
Yes	Iverson	01Kim
Yes	Keener	Paula
Yes	Kellison	Todd
Yes	Kolmos	Kevin
Yes	Kramer	Rob
Yes	Laney	Wison
Yes	Marhefka	00Kerry
Yes	Medders	Paul
Yes	Mehta	Nikhil
Yes	Merritt	Rita
Yes	Moore	Kelie
Yes	Murphey	Trish
Yes	Piatkowski	Douglas

Yes	Poland	00Steve
Yes	Pugliese	01Roger
Yes	Ross	Steve
Yes	Schmidtke	01Michael
Yes	Seward	McLean
Yes	Smart	Tracey
Yes	Spanik	Kevin
Yes	Staples	Shane
Yes	Thompson	Thomas
Yes	UDOUJ	TINA
Yes	WEBB	DAVID
Yes	collier	chip
Yes	ellis	john
Yes	jones	Tom
Yes	miller	steve
Yes	vara	mary

Attendee Report: Habitat Protection & Ecosystem-Based

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06/14/2021 05:15 PM EDT

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505-404-003	04/16/2021 08:02 AM EDT	4 hours 7 minutes

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Yes	Clarke	Lora
Yes	Cooksey	Cindy
Yes	Deaton	Anne
Yes	Gentry	Lauren
Yes	Hartzler	Jeff
Yes	Havel	Lisa
Yes	Hawes	Rachel
Yes	Helies	Frank
Yes	Hooker	Brian
Yes	Iverson	01Kim
Yes	Jaggard	Cameron
Yes	Keener	Paula
Yes	Kellison	Todd
Yes	Kramer	Rob
Yes	Laney	Wison
Yes	Martin	Mallory
Yes	Medders	Paul
Yes	Mehta	Nikhil
Yes	Merritt	Rita
Yes	Morris	Hilary
Yes	Murphey	Trish
Yes	Poland	00Steve
Yes	Robins	Rick
Yes	Schmidtke	01Michael
Yes	Spanik	Kevin
Yes	Staples	Shane
Yes	Thompson	Thomas
Yes	WEBB	DAVID

Yes	collier	chip
Yes	jones	Tom
Yes	miller	steve
Yes	vara	mary