SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

HABITAT ADVISORY PANEL MEETING

Florida Fish and Wildlife Research Institute
St. Petersburg, Florida
November 17-18, 2015

SUMMARY MINUTES

Habitat AP:

Pat Geer, Chair
John Ellis
David Harter
Bill Parker
Tom Jones
Dr. Amber Whittle
Brian Hooker
Lisa Havel
Anne Deaton
Priscilla Wendt
James Geiger
Pace Wilber
David Webb
Dr. Laurent Cherubin
Carter Watterson
Dr. George Sedberry

Council Members:

Mel Bell (Via Webinar)

Council Staff:

Roger Pugliese
Mike Collins

Observers/Participants:

Jason Link
Jon Dodrill
Dr. Marcel Reichert
Tina Udouj
David Dale
Keith Mille
Brad Linus
Lora Clarke
Lisa Havel

Additional Attendees Attached

The Habitat Protection and Ecosystem-Based Management Advisory Panel of the South Atlantic Fishery Management Council convened in the Florida Fish and Wildlife research Institute, St. Petersburg, Florida, Tuesday morning, November 17, 2015, and was called to order at 9:00 o'clock a.m. by Chairman Patrick Geer.

MR. GEER: Good morning, everybody; let's get started. My name is Pat Geer; I'm chairman of this Habitat AP. We've got a couple of new faces around the room, so let's go around and just do a quick introduction and we'll start with Roger and go that way.

MR. PUGLIESE: Roger Pugliese with South Atlantic Council staff and coordinating all the Habitat Ecosystem AP or ecosystem activities.

MR. COLLINS: Mike Collins; South Atlantic staff.

MR. WATTERSON: Carter Waterson; Department of the Navy.

DR. CHERUBIN: Laurent Cherubin; Harbor Branch Oceanographic Institute.

MR. JONES: Tom Jones; Georgia recreational fisherman.

DR. HAVEL: Lisa Havel; Atlantic States Marine Fisheries Commission.

MR. PARKER: Captain Bill Parker; recreational representative, charterboat fisherman, Hilton Head Island.

MS. WENDT: Priscilla Wendt; South Carolina Department of Natural Resources.

MR. GEIGER: Jaime Geiger; South Carolina, Seabrook Island.

MR. HART: Kevin Hart; North Carolina Division of Coastal Management.

MR. ELLIS: John Ellis; U.S. Fish and Wildlife Service; Raleigh, North Carolina.

MR. WILBER: Pace Wilber; NOAA Fisheries.

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

MR. WEBB: Dave Webb; Florida recreational fisherman.

DR. SEDBERRY: George Sedberry; NOAA Office of National Marine Sanctuaries and South Atlantic SSC.

DR. WHITTLE: Amber Whittle with the Florida Fish and Wildlife Commission.

MR. DALE: David Dale; National Marine Fisheries Service, Southeast Region.

MS. CLARKE: Lora Clarke with Pew Charitable Trust.

MS. UDOUJ: I'm Tina Udouj; I work here in the Florida Fish and Wildlife Institute.

MR. GEER: All right, thank you very much. The first item on the agenda is approval of the agenda. Are there any additions to the agenda; does anybody want to add anything?

MR. GEIGER: Would it be possible for us to have an update on maybe the Executive Director search for the South Atlantic or where we are in the process?

MR. PUGLIESE: Yes, I'll do that; and just before we're going to the December council meeting and that is close.

MR. GEER: Okay, anything else? Hearing nothing else with that one change, we'll consider the agenda approved. The minutes from the last meeting; Mr. Joe Graham has done a great job. To let you know, Joe Graham has been transcribing the minutes from the council and the commission meetings for years and years.

He just retired from the Commission because the travel was just getting too much for him; 42 years he was doing the Commission meetings; and at the annual meeting two weeks ago they honored him. I want it on the record, Joe, that I am honoring you again. He has done a great job all these years, and I just heard he is going to continue doing the council from his home.

Are there any changes to the minutes; anything anybody wants to add? Okay, we'll consider the minutes approved. I guess again we're supposed to give opening statements; Roger and I. Basically what we're going to be talking about today is we're going to be finishing up some of our discussions on artificial reefs. We've kind of done it – I think it was last meeting some of the states, all three states, and Florida is going to give a presentation today; and that will lead into our discussion on the beginning of our policy statement for artificial reefs. We're going to follow that with Brian Hooker.

We'll be here to talk about alternative energy activities in the southeast. Jocelyn won't be here; so I guess one of us will have to take the lead on the Energy Exploration and Development Transportation Policy Statement. We'll have that and discussion and hopefully finalize that. We're going to break out into state breakout groups this afternoon. I guess Tina is going to lead us in some online tools and accessing training as well. How are we going to do that, Roger; are we going to basically go back and forth?

MR. PUGLIESE: Yes, essentially we're going to split in half and we'll have half the group ;; the last time when we did something like this, what we did is try to align it maybe like South Carolina, North Carolina and then maybe Georgia and Florida representatives; enough where it becomes an equal amount that can go to the training and the other ones sit here and try to get into state follow-up from the last discussions on state priorities and get into some newer issues on climate and citizen science, et cetera. Essentially we're going to split in half to be able to do that training.

MR. GEER: That is pretty much today. and tomorrow we're going to spend the whole morning on the research and program data needs; going through those for the state needs specifically. Jason Link will be coming in and talking about NMFS policy on ecosystem-based management. We'll have some updates on climate and variability in the fisheries, an update on the South

Atlantic Landscape Conservation Cooperative. We're hoping for a productive meeting. Please ask questions if you have them. The more you guys speak, the less Roger and I have to speak. Please help us out here. If you've got something to say, say it. I'm going to turn it over to Roger now.

MR. PUGLIESE: Just as a follow-up on where Pat has set the stage for this meeting. The Habitat and Ecosystem Advisory Panel really is the foundational group that is providing input to the council to advance our move toward ecosystem-based management and enhance all the activities of conservation for essential fish habitat and any of that that fits into and supporting any of our existing fishery management plans.

Therefore, the activities on developmental policy are going to be integrated into the next generation. The ecosystem plan we'll be discussing and the evolution of the plan itself is going to provide the foundation for discussions and future policy activities. I think Brian has just joined us; welcome.

What I'll do is I'll be opening up with a status report on how this is integrating directly into the Fishery Ecosystem Plan, to development of the process, the EFH update and other activities. Before I go further, we had a roundtable introduction and Brian Hooker has just joined us, a new AP member. I would like to at least get him to introduce himself and then I'll get back into the discussion.

MR. HOOKER: My name is Brian Hooker. I am a biologist with the Bureau of Ocean Energy Management and looking forward to participating with you guys on the AP.

MR. PUGLIESE: Thank you, Brian. As I mentioned, this group is really providing that foundation effort. A lot of the members are involved directly in writing teams, et cetera, for the Fishery Ecosystem Plan or other associated activities from modeling to generation of new information for research or climate or other parts of the different plan activities.

What I wanted to do was go into somewhat of an initial status report of FEP II. Before that, let me just quickly touch on the request on the status of our Executive Director. That selection process has come to a finalization with the December council meeting, the first day of the December council meeting.

Essentially the council will be reviewing the finalists and making a determination on who will be advancing as the next Executive Director. Depending on how that unfolds, that is going to be the timeline. I would assume by the end of the December council meeting, we will have – not assume; Tuesday is the target at this point of the council meeting; which is the 8th, I think, December 8. It is near after 30 plus years.

With that, let me quickly do an update on where we stand with a pretty extensive process that is underway. The AP has been providing the foundation for where we go with writing teams and activities, and this is really advancing. The South Atlantic Fishery Ecosystem Plan, I'm talking about the development of status, integration of the EFH update, five year-review.

Later on actually the ecosystem modeling discussion I'll hold until I get into the SALCC report, because they are actually funding that effort. Some of you I think may go all the way back to the

original foundational information that went into this process with the development of the fishery. The Habitat Plan essentially provided all the information for essential habitat designations and HAPC back in '98.

That evolved to our FEP 2009 initial Fishery Ecosystem Plan, which was the first snapshot of the entire South Atlantic ecosystem and was intended to continue to move the council toward ecosystem-based management. We're now moving into the Fishery Ecosystem Plan II, which is anticipated to be completed in 2016.

That is addressing both the updates on essential fish habitat connected to the EFH five-year review and to further support the council's adoption of the ecosystem-based management strategies. For the benefit of some of the other members that may not have been involved from the beginning, just kind of the foundational goals for ecosystem management, some real basic ones were adopted early on as maintaining or improving ecosystem structure and function to addressing economic, social and culture benefits from resources, as well as biological, economic, and cultural diversity; so advancing our knowledge as well as refinement of that into our region.

Supporting the move towards ecosystem-based management, the complexity definitely makes the activity challenging. The bottom line is that what we want to do is to refine our understanding of habitat, species, species' use, food webs, environmental variability, connectivity, and fisheries which depend on the complex and integrated systems.

The partners are far and wide in terms of who are being involved directly in this process. In addition, refinement and enhancing our regional conservation will help integrate ecosystem-based management into the fisheries' management process as well as integrating other partners or connection with other partners in the region.

The FMP II development process really is based on the regional collaborations and that is going to facilitate its completion. Over time we've been building tools to support ecosystem-based management; online systems with our mapping and GIS, Digital Dashboard, the Habitat and Ecosystem Atlas, spatial presentations of the SA Fisheries, essential fish habitat, managed areas and then online life history information system ecosystem species.

Tina Udouj with FWRI is with us; and as part of this whole session, we're going to have training to access some of these systems and see some of the new information and upgrades. The original FEP, the foundation of moving toward FEP II is essentially an evolution of the existing six-volume set, five volumes of actual materials with one reference areas.

Everything from the core for the habitat is the Habitat and Species Volume 2. The human dimensions are in Volume 3. The threats to the ecosystem and recommendations, where virtually all the policy statements and other information are integrated into Volume 4, and then the research programs and data needs are included in Volume 5. We're touching on a number of these different pieces of this throughout this advisory panel meeting.

As I mentioned, the EFH policy statements, completion of the standings statements and then the redrafts of those with the last redraft with energy is moving forward with the movement of additional new statements for artificial reefs, for climate variability in fisheries, and for food webs and connectivity are anticipated as we continue through this process into 2016.

A number of these are tied to some of the activities that are going on with the new writing teams or new groups that are being tasked with updating information or refining that information for inclusion into FEP II. One of the other aspects I mentioned as part of this FEP process to advance the entire system is to initiate regional ecosystem modeling.

As I mentioned, I am going to defer any of the details to when I get into the LCC, because we are moving forward with building the next generation of ecosystem modeling, a suite of ecosystem models and advancing that into the future to provide tool capabilities both for our Scientific and Statistical Committee as well as the council to move.

It is through the partner collaborations that we're really able to advance that. As I mentioned, there are new components of the FEP II anticipated. The climate variability and fisheries; food web and connectivity; there are a couple other ones that are going to advance forward a regional mapping strategy.

That is something that we're going to build from the entire information system that we've already built on the atlas. We've been compiling virtually all the multibeam mapping components that we can for our entire region, all the way even into estuarine components. The idea is to develop a mapping strategy that is tied very specifically to managed species and habitats in managed areas.

Completing mapping and characterization of HAPCs of marine protected areas, the future spawning protected areas are going to be a priority. In addition to that, the connection with the South Atlantic Landscape Conservation's Conservation Blueprint, we were going to integrate that as well as the next generation of the Southeast Area Resource Partnerships Revised Habitat Plan.

We're trying to engage as many partners, integrate a lot of the broader regional connectivity work into this next generation of the Fishery Ecosystem Plan. Those are all pieces and parts that are all moving at the same time. In order to make this move faster, we've been talking about a lot of this for a number of meetings and had input on writing teams and different things.

In order to move it further, I engaged a group that was involved very heavily in the Landscape Conservation Cooperate, very successful efforts of the Landscape Conservation Group Solutions with Brett Boston, Vern Herr and Brittany Boston providing facilitation for webinars and some very specific in-person meetings; specifically the two areas where we do not have specific sections, food webs and climate are ongoing.

We actually have a food web and connectivity meeting that is a writing team that meets immediately after our AP meeting. That is the process. The core of the edit process that has occurred at this stage was really looking at – and I won't go through all of these at this point – is the habitat sections, threat components, other non-council species like anadromous/catadromous species, and protected species; so to try to initiate all those and move the process forward, essentially look at the existing sections and outlines, assess the materials to look at different perspectives on what needs to be updated; consider what's available and applicable for the South Atlantic and then really being able to provide the updates to those sections.

Then as they are moving through this review, also look at any available new spatial data on the species or habitats; look at any new data on species' use of habitats. That is something that ties back to one of the EFH five-year review comments about getting refined information of that in addition to inputs for any of the ecosystem or connectivity modeling.

In order to facilitate this, the group provided both some survey capabilities, use of Google documents initially and a base camp repository so each of the teams has access to as much information individuals can provide those to all the partners and advance it. It also has the Word documents for the different activities; and I think we'll be going back and forth on how this gets finalized as each team advances.

They are in the next stage of development now. Generally, at least in the initial stage there were two camps, one on the habitat components; and with regard to that, the timing. We initiated the participation in August pre-webinar, webinar through October. There is a webinar summary discussion, and the groups are actually taking the next steps and looking at the documents and providing the inputs and then looking at team-tasking of advancing the actual reviews right now, literally at this stage.

The initial section reviews are anticipated through February of 2016. Then there is going to be a real effort. We're really focusing on the first stage, but then there is going to be a real effort to look at potential cross-review between groups, so that there could be the opportunity to learn or expand the information or add sections that may cross between those sections; probably starting in February of next year, with the idea that on the habitat components that the draft will be completed.

Those individual section drafts hopefully will be done by June of next year. On the species' sections, there is going to be notices to do the webinars. That is a next stage that are going to happen next year, most likely in February of 2016. One specific in-person meeting will probably be snapper grouper held in Charleston, I'm pretty sure, potentially that first week in February, just because of the complexity as well as its potential connection directly to the mapping strategy.

Trying to weave all these different things to get as much as you can out of it with not trying to overburden and take advantage of the technologies with the facilitation and capabilities we have. The bottom line with that trajectory is probably looking at those reviews and finalization of the drafts coming up after the June into August. That is moving those two major portions of the FEP.

The other ones were coordinating with the individual other species' sections or non South Atlantic species, for example, working with Lisa Havel and a lot of the activities of individual ASMFC activities on those species-specific updates and advancing that. One of the things that ties to the species activities is something that we took advantage of as an opportunity to advance our information to support the EFH five-year review and specifically to species' information to contract directly with FWRI to enhance what we have on species use of habitats.

The idea is to have that information compiled, reviewed, developed by the end of this year so that it gets advanced to the individual specie's discussion. That information actually can be provided as background materials as the managed-species sections review that; plus that

information can be integrated into the five-year review report out; plus the individual subsections of the FEP, plus even things such as I think that EFH summary document that we've been working on; that opportunity to maybe integrate some of that into the background and into the future.

It also provides input parameters directly into the ecospecies online system, so the idea is to change the ecospecies online system to very specifically identify associations by life stage to continue to expand and refine and fill that information. This is all supporting the FEP. Those are the webinars that I identified, that have been conducted already, advancing it and pre-webinars for the connectivity and climate sections.

Those two meetings; one is happening later this week; another one will be in Charleston for climate in advance of the SECOORA meeting. The Ocean Observing Association, a number of the participants are actually on the board of that group. For this first stage of those initial ones we're looking to October activities, November team discussions; and then as I mentioned before, moving into February; which gives us kind of the broader timeline where at the September council meeting we had updates.

At the December we anticipate approval of the redrafted EFH policy statement on energy for inclusion into FEP II; in March moving forward with again status reports, but also looking at outlines on new policies for artificial reefs. I'm not going to read the rest of it, but what it does is it sets the stage for the completion of the FEP II with different benchmarks on policy development and refinement.

Some of those will shift if we can get those done earlier as the teams are working; but as key, even though there may be those groups working to provide input, the AP is the foundational group that will provide those to the council for consideration. That has to be factored into some of these timelines. If we have an April and November meeting, the timing to get those completed in the background then brought to the group for refinement and approval are going to be integrated.

This is probably a little clearer showing that, but as I mentioned it all depends on how we proceed and how far we can get with that. That was the long, quick snapshot of where we stand with the ecosystem planning process. An amazing amount of individuals brought into this, but what I think is really good is some of the new technology.

While it might be a little bumpy to get started on some of the new technology, the ability to transfer information between the different groups is really a powerful tool, and it is going to provide that. Group Solutions group is not just going to be providing this and stepping away. They are actually working in the background to foster and keep these connections going to do even some of the initial combined reviews.

Then we'll have a technical review group that will provide kind of the technical review of the section, the finalization of the bigger documents, so we make sure we've got all our things advancing. I think the biggest takeaway on this is that we have time with this; where before we were moving so fast that we just really had to get at some of the sections that really fell by the wayside in terms of missing individual areas or sections or whatever; because we just had to get it combined with the comprehensive amendment.

Here we can really make it advance what the council needs to move towards ecosystem-based management as well as weave it together with partners in the region to get even a bigger footprint. This food web and connectivity discussion, we're talking about hopefully really begin to integrate understanding from the mountains to off the Continental Shelf in some of these; and then maybe even some of these tools with the modeling that we're working that actually can advance some of these efforts.

I think this provides the opportunity for the council to advance this and advance even new policies as we mentioned on food webs and climate and different things that had been really building, and here is the opportunity to advance that. That is the snapshot of where we are.

MR. GEER: Off the top of your head you listed, how many workgroups were there, do you think?

MR. PUGLIESE: Well, there were I think at least 20 with those sections; and that doesn't include some of the other subgroups that we want to engage for mapping strategy or for other different activities, as well as the non South Atlantic Council components that we want to advance on that.

It is a lot of new players, a lot of people that were involved in some of the preliminary, but new players that as the groups are looking at this, they are bringing in other ones that have the expertise that they may need to get or newer work that's done in this area or new analysis done so it continues to evolve and expand and get refined as we move the process forward.

AP MEMBER: Was your PowerPoint included in the material that was sent out to us?

MR. PUGLIESE: No, I'll get that out to you. We'll have that loaded to the site and get it out to everybody.

MR. WILBER: Roger, is the same consultant organizing the habitat stuff also doing the species groups?

MR. PUGLIESE: Yes, they are; they are going to be doing that too.

MR. WILBER: It would be helpful if the consultant was directed to provide more input to the teams on what the other teams are doing, because the meetings that we've had we're constantly asking like what is going on in the other groups? We don't really have any information about that – and knowing where the boundaries are between the groups so that we make sure that we deliver on our team's expectations is important.

MR. PUGLIESE: Yes, I think that is going to be important. It is something that I need to get also in the middle of it to make sure; because while they can move the process forward, I think I need to get some of that messaging in there. That is anticipated, especially with what they looked at as kind of the next step.

They were trying to look at focus, but those questions continued to come up. They don't want to be crossing the lines or redoing information that may be covered in other areas. We'll make a better effort to ensure that those types of things are known across the group. Probably the bigger

picture for the groups, I'll be getting something out so that everybody knows more of the entire process, the whole nine yards. That will hopefully help, too.

MR. WILBER: The other issue; one of the bugaboos of the Habitat Plan in the existing FEP is the inconsistent use of terminology as you move from one chapter to the next. That is something that we really want to see fixed in the second FEP. My concern is that the only real kind of checking right now on the schedule across teams is happening kind of off process sometime between February and June.

Once the teams have kind of finished or at least the habitat teams have finished writing their particular sections, I would urge you to find some mechanism to promote consistent use of terminology as rapidly as possible, so we don't end up repeating some of the bugaboos of the past. A great example is hard bottom. There is at least ten different ways hard bottom are explained in the FEP and the Habitat Plan. There is no reason for that.

DR. SEDBERRY: There is three different ways hard bottom is spelled, two words, one word, hyphenated.

MR. PUGLIESE: Yes; and I think that is a combination of both making sure that we know which each of the groups are; but then those couple different levels of editorial review, both the true editorial and then the technical. I think hopefully we can make sure that those are integrated in the individual section as well as the broader document itself.

That is something that we will make sure that we get accomplished early. I knew that you were going to raise that; the live hard bottom, because that has been a standing issue on that. That is something we need to make sure it's consistent across those, especially since it is tied directly to the way we manage those resources under the FMP.

MR. WILBER: Well, it is more than just cleaning up the FEP, because eventually once the FEP is clean, it makes recommendations for the next EFH five-year review. Under the letter from Dr. Crabtree approving the first five-year review, one of the things he indicated he expected at the end of the next five-year review was a set of recommended changes to the EFH designation; so the actual designations themselves are consistent in their use of terminology. The foundation for all of that lies in the FEP.

MR. GEER: Is there a particular volume that needs more work than others?

MR. PUGLIESE: I think there are subsections of individual volumes; and those became apparent when we were looking at individual habitats or individual sections, ones where we didn't have as much focus. I think of species, spiny lobster, I think of habitats; some of the review that we had for maybe it was seagrass where we didn't get as much of some information from one state as we did for another.

It is kind of pieces through there, so the focuses have become obvious when we've gotten into those team discussions. But beyond that, there is the human section that we're not focused on and we're going to engage I think our SEP and maybe participants out of the Southeast Region in terms of refining some of that information.

Plus there is that opportunity to take a lot of the information, that type of information directly from the most recent amendments to the fishery management plans; so that is going to be another part of this. That is something that I think we're going to advance, as well as the whole issue of updating and integrating the other non-council managed-species section. That is something that does need to be ramped up, too.

MR. GEER: Any other questions for Roger; any other comments?

MR. GEIGER: Just some background; this may be a stupid question because of my newness on the panel here; but when the original FEP was completed and after we've used it for a while, did we go through a situational analysis to say what worked well, what did not work well, what needs to be improved; and have that critical analysis of the FEP I before we embarked on the revision? Was there any kind of thoughtful process on that to really see what really needed to be done, changed or modified before we embarked in the second draft?

MR. PUGLIESE: Other than the reviews of EFH as part of the EFH five-year review that was an integral part of the FEP, not really to some degree because the FEP was really looked at as truly a source document to advance this with the policy analysis integrated into it. I think what we have now is we have the opportunity to advance that further.

I think we're in a different stage in terms of how we can make this even more effective so a review of where we were wouldn't necessarily get us to where we need to be. What we need to do is get it there. I think spend the time instead of doing a full review. Like I said, EFH we had the five-year review and we are addressing those.

But in terms of operationalized, that is why you're seeing new sections on climate and new sections on food webs. Those are the shortfalls we didn't have a chance to build enough of that information to advance those types of policy discussions in the past. I said the other support activity, modeling effort that we're trying to do at the regional level, tool capability, connections to other ones; so I think that is why you're not seeing – however, there are some other guidance.

We'll have a presentation later – we'll have it tomorrow from Jason Link on National Marine Fisheries Service advancing EFH policy. There are some specific discussions addressing what may move forward on the Fishery Ecosystem Plan that are being used. In addition, at the council meeting we're going to have a presentation by Phil Levin with the Northwest Fisheries Science Center on the Lenfest activities, which our fisheries and ecosystem team, which will be having some specific recommendations into the future on also how to make the ecosystem plans more operational. I think we're going to be further along than some of the other ones to make them happen. The bottom line is to get the work done, advance it, and refine the process as we go instead of worrying about really where it was.

I think some of the shortfalls in terms of structure, in terms of different things are pretty obvious on what we need to do. I think taking the time to make it right this time, advancing it as far as we can go is going to be the most important. Again a long answer to a short question; that is where I think the most beneficial effort is right now.

MR. GEER: At the last meeting we had a presentation by North Carolina, South Carolina and Georgia on their artificial reef programs. It became apparent that those three pretty much all

kind of work in the same manner or the same kind of structure. Florida didn't present. They are going to present today. I think that is probably good, because Florida's program is a lot larger, a lot more complex, partners in every county. It is a lot different than those other three. We have Keith Mille and Jon Dodrill. Gentlemen, you have the floor.

MR. DODRILL: What we've put together here is kind of an overview of our program. A short summary is the types of materials on a project that we've been involved with in recent years, and following that up with some trends that we observed in recent years that perhaps we might want to think about as we move forward to do the edits in the FEP plan.

Just keep in mind here with Florida's situation. like Georgia, South Carolina and North Carolina that because of the dual extent of our Florida coastline and the very limited artificial reef staff, we have developed over a period of over three decades a working relationship with the local coastal county governments and municipalities.

They are the ones that actually hold the artificial reef permits and we provide technical assistance and financial assistance through federal sportfish restoration and also saltwater fishing license revenue funds. It is set up a little bit different. A lot of times local county artificial reef coordinators have some autonomy, but we make an effort to coordinate and work with them.

MR. MILLE: Yes; so our Florida FWC program, artificial reef programs consist of Jon Dodrill, the Program Administrator, myself, fisheries biologist, and Bradley Ennis who is also joining us here today. It was the three of us together with this large partnership of the 35 coastal counties around the state.

We thought we would just start with the typical definition of what is an artificial reef. We fall back to Bill Seaman's definition being one or more objects of natural or human origin intentionally placed on the sea floor, influence physical, biological or socioeconomic properties related to living marine resources. I also wanted to follow up on this slide – and we've talked amongst the states before to try to come up with a nationwide tally of the footprints or the number of artificial reef modules.

It has become quickly apparent that we're all defining what an artificial reef is a little bit differently. As you read the FEP document, you'll see some of the states are referring to artificial reefs as the permit area. In Florida we track an artificial reef generally as a deployment spot and that will be at least 150 feet from its nearest neighbor.

Whereas, Alabama tracks almost every piece of material so they would report hundreds of thousands of artificial reef sites; in Florida we're reporting just over 3,000 artificial reef sites to date. I think that is important especially when we're going to be comparing artificial reef development between the states.

The types of materials that we're using are composed of stable, durable, environmentally friendly materials such as clean concrete, limestone, steel or a combination thereof. We also have prefabricated units that can be produced of standardized size so we can get a known surface area and footprint.

One of the challenges I think – and, Jon, I don't think this ended up in the trends part of the presentation; but thinking about this slide, most of the design modules that we are seeing are designs that have been proposed to us from manufacturers. There really are very few manufacturers at least in Florida. Maybe we're dealing with really only two or three that are designing the modules.

I think if we are to take it to the next level and making fisheries management recommendations, there is going to have to be much greater input from some of our researchers and biologists with some feedback from fisheries-independent monitoring and other efforts; such as the work that Bill Lindberg is doing out of the University of Florida.

The next slide here is an artificial reef use. Specifically we're building fish habitat. Our funding source is from sportfish recreational fishing; so there is a strong expectation for enhanced fishing opportunity and diving ecotourism is also one of the objectives, particularly with the large steel vessels that we have in Florida.

The economic benefits have been well studied over the years and the numbers are quite impressive, especially considering that for many of these secondary-use materials and donated materials, we are able to build long-lasting habitat at very low cost. Back in '98 they calculated for every one dollar that was spent, they were getting a return of $138.00.

When we have had subsequent studies such as southeast Florida, southwest Florida, and then most recently in January there was a statewide study that Dr. Bill Huth completed as well; all these show very strong economic returns on our artificial reef construction dollars. Our goals are to provide long-term benefits, use them as a scientific research tool.

We're struggling still to find opportunities for incorporating artificial reefs as a fisheries' management tool. We continue to coordinate and cooperate with stakeholders and build stewardship and better understanding of artificial reefs to try to help the public and users of the artificial reefs understand some of the misconceptions that might be out there when they are out there harvesting fish from these structures.

Our program, we provide, like Jon mentioned, grant funding to local coastal governments, eligible nonprofit organizations that are involved with artificial reef development. We use our funding to not only construct artificial reefs, but we do have some monitoring and we funded some research projects over the years as well.

Those have helped us to make improvements to our future design. We also work closely with the regulatory agencies, the Army Corps of Engineers and DEP, to review permits that are all held by our local coastal governments. That makes Florida unique from the other states. I've got a list here – and I hope you're following along, Roger. We just got a list of some publications. It is not really intended to go through every one individually, but we do have a long list going back 30 years now of planning documents, strategic guidelines for the artificial reef materials. In 2011 we came up with siting guidance and deployment methods for southeast Florida.

At the end of this list, I've included the rewrite of the FEP as well with the South Atlantic Marine Fishery Council. Also, in addition to these formal publications, we have some in-house

building analysis programs. There have been a number of research papers and theses that have been generated from the research projects we funded.

There are also a number of mitigation performance reports, which artificial reefs are an important component of especially in southeast Florida; and again a number of socioeconomic analyses. One of the important components of our program is to work together with Florida Sea Grant to sponsor workshops and conferences statewide with our stakeholders and our counties.

Most recently we had our 2015 Artificial Reef Summit in Clearwater. We had about 200 attendees there. This was an opportunity for us to bring some of our contractors together with the stakeholders together with our county artificial reef program managers to talk about artificial reef development in their region.

One of the themes this year was to help the attendees really think more deeply about the interactions of artificial reefs as far as habitat and purpose and some of the tradeoffs that are involved between the socioeconomic expectations versus the biological expectations and how reef planning needs to be thought about in more of a complex way.

This flow chart here is just one method that we came up with in our 2011 work to help artificial reef managers think about design, construction, evaluation and feeding that back to your reef concept; and, of course, that is all influencing the ecosystem in the region. Getting back down to some of the details in our state; statewide as of today we have 3,671 deployments.

Over a thousand of those are in the Atlantic and 2,600 are on the Gulf Coast. Focusing in on the Atlantic Coast, I put up this view here because ArcGIS just recently updated their online explorer tools, so there is now an ESRI Explorer Tool and we've got that QR code up there. We attended the DIMA convention last week and had a little iPad kiosk up there to try to promote this as a way for user groups to explore Florida's artificial reefs virtually.

We're trying to leverage a little more of the GIS tools to help better illustrate the locations of artificial reef, and have that as a backdrop; and on the Atlantic Coast we have 42 percent concrete materials, 34 percent steel vessels, which is primarily in southeast Florida. That is really what makes the east coast unique.

There is a lot more vessels and barges than the other parts of the state. Design modules are highly used up in the Florida Panhandle; but really so far there is somewhat limited use on the east coast of Florida; representing 9.8 percent; and 8.3 percent are other metal materials that is significant steel deployments out of Cape Canaveral. These are scrap materials that were deployed from some of the old launch pads in the 1990's, for example.

Limestone boulders are an example of some of the rocks that we have deployed as artificial reefs. A lot of that is represented in some of the mitigation reefs that are constructed in southeast Florida. Then that other category, 28 percent represents the smallest amount, but sometimes some of those materials that were deployed early on in Florida's artificial reef history and elsewhere still continue to get some press now and again.

For example, that might be in the Osborne Tire Field off of Deerfield Beach and Fort Lauderdale, which is an example of where there is some effort to remove those materials that

were deployed in the 1970's that we have long known that were not deemed stable and durable material that were originally anticipated. That is kind of the statewide Atlantic Coastal Overview.

Looking more specifically at southeast Florida, we have this image that shows some of the trends over time. Again we're looking at steel vessels, barges and secondary use concrete, concrete modules, natural rock. We're looking at these different decades; prior to 1980, 1980s, 1990s and the 2000s.

To get the trends we wanted to illustrate here, there was kind of a peak in steel vessel deployment but then that's declined. Other miscellaneous steel has declined as well. Some of that is sometimes related to the cost of scrap steel. When scrap steel prices are very low; that is when we see the greatest number of steel vessels offered as deployment. Otherwise, they're going to the scrapyard.

We are seeing an increase in the number of modules. That is that black diamond, black line that you'll see over there. Concrete second-use material has been basically stable. Currently again we're looking at 33 years of successful partnership with our local coastal governments. It has really helped us to make sure that we have a strong presence in every one of the counties by building those relationships.

Again, the local coastal governments hold the artificial reef permits, which make us unique in the states in that. Our artificial reefs range in depth from 40 to 114 feet, with the average being about 65 feet. We've selected just a handful of recent projects just to kind of get a little bit of a flavor of what we've been building over the past year or so.

This year we deployed 1,500 tons of secondary use-concrete off of St. Lucie County. We are utilizing sportfish restoration funds together with a small county match. This is an example of in Brevard County one of the concrete module deployments. This is the pyramid, it is three tons. These have been evolving over the years; and this latest version of it includes a 36- inch opening at the top of the module to allow for the escapement of marine turtles if they happen to burrow underneath and then end up inside of it.

The National Marine Fisheries Service, as part of the permit review process, wanted to make sure that we are considering marine turtles in design and development. This is the latest marine turtle friendly design of this type of pyramid module. One thing I wanted to mention on this slide as well; that this new contractor we have out of Fort Pierce, Florida, McCulley Marine, this year they started using a new barge which has – it is difficult to see in this picture, but there is a steel kind of a stanchion on each of the four corners of the barge.

You will see those kind of in red there, those little towers. Those are actually a system in which they are winches for an anchoring system. This barge is able to deploy four anchors; and with this four-point anchoring system, they also have a GPS antenna on the end of the boom. With this new technique, they are able to bring their accuracy incredibly accurate. In the bottom left corner of the screen you can see the deployment pattern for this particular project where they actually were able to – aside from their is kind of one outlier over there to the east; everything else is pretty much planned as it was intended to be put. Those are 50-foot apart.

Prior to this type of design, it is not uncommon to see a plan for a rectangular deployment such as this end up just as a scatterplot on the bottom. I think we're excited to see some of the contractors improving their accuracy deploying especially for the concrete module where we're really paying top dollar for the use of these units.

Another project we wanted to highlight this year was in Palm Beach County. This is completely privately funded. It is the Andrew "Red" Harris Foundation. It is in memory of a young man who was killed during a boating accident while he was snorkeling off of Palm Beach County. These are new modules designed. These are called reef cell modules. These have a lot of complexity to them.

There were 40 modules designed and they stand anywhere between four and eight feet tall. They are really trying to mimic some of the reef features that are found off of southeast Florida. These are concrete with some fiberglass embedded to give a little bit of strength. We're looking forward to seeing how these perform over time as well.

The last large steel vessel deployment that we have is the Hoyt Vandenberg deployed off of Key West in 2009. The vessel was deployed to help improve the diving ecotourism in that area based on Bob Leeworthy's work. They confirmed that it did provide that economic output that they were intending.

However, some of you might recall that the Spiegel Grove Project up in Key Largo was deployed in 2001. Both the Spiegel Grove and the Hoyt Vandenberg Project were authorized by the Florida Keys Marine Sanctuary, with the expectation that deploying these locations are going to increase diver activity; that they would subsequently reduce diving activity on the nearby natural reef.

In the case of the Spiegel Grove in Key Largo, what they found was that the vessel in fact did increase overall diving activity in the region, but at the same time they saw an initial reduction in diver activity on the natural reef. In the case of the Vandenberg where really Key West has never been a historic diving destination, I mean not as much compared to the middle or the Upper Keys; in the case of the Vandenberg, the Vandenberg did bring additional divers to the area; but unlike the Spiegel Grove, they found that diving activity also did increase on the nearby natural reef as well.

I think these large ship projects that we've experienced in the Florida Keys have given us really good information for future planning as far as what our expectations might be for diver visitation and economic benefits of these high-dollar projects. I think the final cost for Vandenberg was about nine million dollars, I believe.

MR. DODRILL: I think it was about 8.4 million dollars. I just wanted to comment here the only reason that the 510-foot Landing Ship Spiegel Grove was deployed in the Upper Keys and this missile tracking ship Vandenberg, a World War II era 520-foot, 13,000 ton vessel was sunk off Key West – the only reason they were recycled from the National Marine Sanctuary perspective was to see if in fact diving pressure would be shifted from surrounding natural reefs to these large artificial reef structures.

As Keith said, the Spiegel Grove in the northern Keys was based on a one year pre-deployment and post-deployment surveys of nearby natural reefs and then ultimately when the vessel itself sunk; there was a shift in user activity and increase at the Spiegel Grove Site in the Upper Keys. As Keith mentioned off Key West, there was a relatively large diver increase in activity overall both on the natural reef and the Hoyt Vandenberg. This again was just based on one year post-deployment out and pre-deployment observations. Over time this could change even further.

MR. MILLE: We also just wanted to mention some of the monitoring that we do both in-house and contracted. Most of our in-house stuff is spot-checking. We rely on contracting out to either the counties or nonprofit groups or especially universities to do some of the more in-depth research monitoring on artificial reefs.

These reports are providing us information on the biological, the structural performance and again the socioeconomic benefits of the artificial reef sites. We also wanted to touch on some of the reef restoration and mitigation projects that are going on along the east coast of Florida, particularly southeast Florida.

A lot of these are associated with beach nourishment activities that result in either direct or indirect burial of nearshore hard bottom or potentially impacts from dredge activities that have gone awry, although in today's times the GPS accuracy is much greater so we don't have some of the direct dredge impacts like were observed in the early nineties.

There are also some examples of ship-grounding sites. All of these mitigation projects use manmade activities. Most often they'll use natural materials placed very carefully in the center. There you see a very precise limestone boulder placement associated with – I think it is off of Dania Beach, a mitigation project off that nearshore hard-bottom burial.

In the top left you see a concrete module that is off of Miami. That was from one of the early 1990's Sunny Isles Restoration Project. Then on the very bottom you will see some of that profile drawing and the photos associated with it. That is being conducted just this month; it should be complete any day now.

This is a reef restoration repair from the Spar Orion grounding in which they are using limestone boulders that are imbedded in concrete to stabilize the reef structure and provide some of that habitat. The other photo there, the photographer is documenting some concrete modules that were deployed as mitigation at the Memphis Grounding Site.

That is being used as a nursery ground for some coral that might be recovered from pre-dredge projects such as the Fort Lauderdale Channel Expansion and such. Artificial reefs can also be used just to help support nursery grounds for coral transplant.

MR. WILBER: Just as a side note; the U.S.S. Memphis is a nuclear submarine that I guess took a hard left and came in on the outer reef track off Broward County a few years ago and damaged the reef.

MR. MILLE: Yes; unfortunately we have a growing list of reef damage caused by vessel traffic, and there have been great strides in recent years to help improve the anchoring areas as well as to

improve some of the monitoring, too. Now we're kind of getting into the last part of the talk where we wanted to talk about some of the trends that we've been observing in Florida.

As some artificial reef sites, after 30 plus years of development, we're having a lot of the counties kind of go back and revisit some of the older sites and propose some additions to those sites. There is this concept of connectivity reefs. This is an example of a site off of Miami-Dade County where those purple dots; the A, B, C and D are proposed lines from boulder deployments that are to be placed between some existing steel materials, a few army tanks, a barge and some other concrete and limestone boulders.

The concept here that we're hearing from some of our stakeholders is these connectivity reefs are going to help the fish move between structures; but there is also a component of the dive attraction as well. Some of these are more; maybe a better term would be diver trail, if you will. There is also the concept of the stepping-stone reefs, reefs placed outside inlets and such.

I think there is that concept of trying to create habitat to facilitate movement of juvenile fish to more adult habitat by creating more shelter. That is a concept that Dr. Lindberg was experimenting with through the Steinhatchee Fisheries Management Area of work off of Big Bend of Florida.

He was looking at a much, much greater scale, looking at the gag grouper moving from the seagrass habitat along the coast out to the deepwater spawning habitat. He was looking at reducing the mortality of the year one to year four gag grouper by creating artificial structure in the patch reef habitat.

I think we're hearing some of these stepping-stone types of reefs a little bit more. I think we probably need to see more feedback and more data on the biological performance of these reefs. From the divers perspective, of course, they love it, but I think we do need more research on that end to document how the concepts are working or functioning. Anything else, Jon?

MR. DODRILL: We also have a trend, as many of you have probably seen in the news over recent years, of these art form and novelty type reefs. There has been an increase of interest in statues and other types of deployments that really have more of diver interest than a fish benefit. I think the biggest one in Florida that we have on the east coast is the Atlantis Memorial Reef deployed in 2007. There you see the lion at the gate.

We worked together with the county at the time and the vendor to modify that design somewhat as best we could to increase habitat complexity. On the base of each one of those structures, there are actually openings that are being utilized by lobster and some of the reef fish. We have other examples like a memorial reef, such as the Jesus statue deployed at the John Leone Reef in Jacksonville this year. Then we also have the Blue Heron Bridge Snorkel Trail in Palm Beach County. They gradually have been adding to that site.

I think they are about at capacity now with the final deployments being a hammerhead statue, three of them that were deployed this summer, and those complement some limestone boulder deployment that we funded last year as well as some other materials and modules that the county placed over the years.

On the top right image there is the Rapa Nui Reef. This is totally privately funded, $500,000, from a private donor that wanted to do a large public art project but also create marine habitat. These were statues similar to the Easter Island statues that were attached to the barge with the idea that the barge would be deployed and go down to the bottom upright and divers would swim amongst these statues.

Unfortunately, there was so much media attention that they placed on this that the low bid contractor used just one anchor in the bow and one anchor off the stern, which was slack, so basically just a single anchor. As we've seen on so many other barges that were flooded equally across the barge, it ended up flipping and is now upside down on the bottom. We just wanted to include this slide here to mention some of these art form novelties to the reef setting and that we need to be careful that the media attention doesn't deduct from the need for contractor oversight.

MR. DODRILL: Another thing I wanted to mention regarding underwater art form and novelties is FWC does not pay for these projects. By rule we do not fund underwater novelty and art projects despite the fact that some of them may provide fish habitat. Others, as Keith mentioned, are almost more a media event than anything else.

Basically there was $500,000 that a philanthropist put up that was wasted when this barge, over our concerns that there were stability problems, this whole thing flipped upside down and crushed most all of these Easter Island imitation statues under the barge.

AP MEMBER: I had a quick question with some of these novelty statues that are being put down; are they cleaned regularly or are they allowed to actually bio-foul?

MR. MILLE: Now for the Atlantis Memorial Reef, I believe there is an agreement that the vendor has with the county and as part of the permit. They don't actually clean the whole structure. They go down and there are plaques that are memorializing individuals. I believe that there are some criteria.

Obviously, coral polyps will settle out; but if they're removed before they become a certain size and it is very small, I think that somehow is allowable and maybe they are just cleaning it off so frequently that the coral polyps are never able to be visually observed on there. That would be the only example. All these other ones they foul so quickly it is just not possible.

In fact, I saw one more recent photo of the hammerhead statue, and it is already becoming so fouled that – I mean, you can still tell that it's a hammerhead but over time a lot of these statues become unrecognizable. The next slide is marine debris, which is another trend that we've been trying to get a better handle on and better documents.

There has been some marine turtle mortality associated with artificial reef. A lot of these are a result of entanglement in monofilament line; and sometimes that monofilament line is accumulation as a result of the structure itself. Unlike a natural reef that might have more curved shape and more solid structure, an artificial reef such as especially steel material is more likely when you catch a fish; that that fish could duck inside the structure and that monofilament line will be cut and accumulate. We have some documentation, although it is very, very few.

All of those marine turtle mortality reports that we hear of we report to the marine turtle stranding network. That information is used by FWRI and National Marine Fisheries Service to make their decision on permit authorizations for artificial reefs. That is kind of the small monofilament line and some of the small materials that we're somewhat observing, but we do have some cases of some large commercial debris.

Back in 2013 the Tenneco Towers, which are steel oil and gas structures off of Miami-Dade/Fort Lauderdale area; this ghost net drifted up on it; and it was so large and so deep that it required commercial divers to remove. We discovered at the time that we just don't have the funding within our state.

We scrounged together some dollars between DEP/FWC limited dollars and the NOAA Marine Debris Program we were able to remove that. Those large project contingency is something that we're keeping an eye on. There are efforts statewide and nationwide. In Florida we have a large monofilament recovery and recycling program and that has been highly popular with the public.

DET Coral Reef Program out of Miami has a new marine debris coordinator; and Project Aware just this year is really getting off the ground; this excellent interactive website to try to motivate volunteer dive groups to remove the debris, and it is called the Dive Against Debris Program. I would recommend looking at that. Those are some efforts towards helping the department address this issue.

On the next slide, other recent trends that we see in Florida; there is an increased interest for placements in state waters. Some of these are the obvious, ease of access. There is a growing interest in kayak fishing, so there have been a number of deployments in areas that are accessible to a kayaker.

In this case we're looking at a NOAA nautical chart of the Volusia County area out of Ponce Inlet and there are two reefs located about 0.8 nautical miles off the beach. Those are intended to be accessible by kayak fishermen. There is another aspect – and this is maybe more so on the Gulf Coast but there is probably an element on the east coast as well, and that is to take advantage of situations where the state fisheries' regulations might be inconsistent or less stringent than the federal regulations.

We're hearing from stakeholders an interest to increase artificial reef development in state waters so they can fish under state regulations. That is kind of a change from the past where historically there was actually incentive to place in federal waters because you only needed one permit. The counties are making an extra effort now to get both the federal permits and the state permits from DEP for those deployments in state waters.

We also have an increased interest in estuarine deployments. These are artificial reefs under docks. There are a number of dredge holes in Palm Beach County, for example, where artificial material is being used to try to get the elevation back up to more native depth levels. We also have an increased oyster reef development in Florida, although that is not something that our program is directly involved in.

Our FWRI Habitat and Species Program will be more directly involved in oyster reef development. Then we also have an example of a riverine reef up in Jacksonville; that small

materials were deployed in the St. Johns River; still a marine environment, but they were looking for some accessible areas that are close to some neighborhoods in that area.

Some other recent trends, of course, with the recovery of Goliath grouper, Goliath grouper are utilizing artificial reefs for spawning aggregations, so here in 2012 you've got the Esso Bonaire Reef in Palm Beach County. These are becoming great ecotourism dive attractants and really bringing great business to those dive shops in that area.

However, this is a polarized issue and there are many, of course, on the fishing community side, some conflict with that. If you look in that bottom right photo, you will actually see a spear through the head of that Goliath grouper. Awareness of this controversy is I think being considered in some of the counties where there is actually consideration towards making some new artificial reefs perhaps less attractive to Goliath grouper, more low-profile structures.

That is just one additional consideration. Another species is lionfish. Our agency has, together other agencies, been very deeply involved to try to motivate the public to remove lionfish. As it relates to artificial reefs, of course, lionfish are found across a wide range of habitats; artificial reefs included.

Similar to the Goliath grouper discussion, I think we're also hearing some discussion amongst stakeholders of perhaps building artificial habitat that is less likely to attract lionfish; although they are so ubiquitous, I don't know if that is actually going to be a reality. On the other side of the coin, we're also hearing of interest in trying to make artificial reefs more attractive to lionfish with the concept of using divers to then subsequently remove them.

I find that the lionfish problem is very interesting talking to the stakeholders; because as they're thinking about lionfish in ways that remove and reduce the populations, they are really talking about some of the same ecological principles that we deal with on other targeted reef fish species.

It has been interesting to me for some stakeholders that have the belief that through directed fishing pressure that they can eliminate lionfish at least in a localized area; but yet when it comes to some of our managed fish species, they don't seem to have that same perception. I think there is a little bit of a learning opportunity here to share some of the ecological principles that we're learning here to relate to other managed fish species.

MR. MILLE: As an additional note, some of the highest lionfish concentrations observed in the western hemisphere have been on artificial reefs in the Florida Panhandle at depths of 80 to 140 feet and also off Jacksonville on a large sector of these concrete artificial reefs. I mean you're talking about four divers one day getting 600 lionfish off a single concrete culvert artificial reef. I'm just throwing that out. Talking about aggregating certain types of species onto an artificial structure, lionfish is that classic example of that.

Also thinking about back to the Hoyt Vandenberg Project out at Key West, you know a very high profile structure and that is frequently dived by the dive shops. Many of the dive masters will always be carrying the lionfish gear with them. Even though it is prime lionfish habitat, the few dives that I've done on the Vandenberg, you are very hard pressed to find a lionfish on that

structure despite the attractiveness to the lionfish. That is a result of the diving pressure. We're trying to get the message out to the public to help remove this species.

Some other trends that we've seen; Tubastraea coral is the orange cup coral and we're finding it on a lot of our steel vessels. Tenneco Towers, the ribs are all covered with the orange cup coral. You find them just kind of in the shady areas of the structure. That is something we're keeping an eye on as well.

There has been interest in deepwater corals and using artificial reefs for enhancement. Of course, there is the Chris Koenig and Sandra Brooke Project back in the late nineties. These projects, they are so deep that there are a lot of challenges doing research at that depth. As much as we'd like to see if there is any additional contribution artificial reefs could make to those habitats, just the expense of accessing those, of deploying and then the follow-up assessments is quite large.

There is also the concept of perhaps using artificial reefs as a deterrent to illegal fishing. That is something that is being widely used, of course, in the Indo-Pacific and those areas where there are really no regulations. In this area of the Oculina Research Reserve, for example, the HAPC, we really have yet to implement that strategy. I think technology is on our side there with the vessel monitoring system.

Other recent trends is trying to leverage technology more to improve our habitat mapping of artificial reefs, habitat planning. We're using acoustic tracking devices to listen for fish movement between artificial reefs and natural reefs. Also this past year USF completed an acoustic-listening project where they using acoustic devices to listen for boat traffic to look at boating activity on artificial reefs compared to natural reef.

It was really quite impressive that for the first time they were able to in real-time document the extremely high use of artificial reefs compared to some of those nearby natural reefs. ROVs and again sharing GIS information like the training I think you all are going to have this afternoon, I think is valuable information for us to help navigate into the future for artificial reef management. That kind of sums it up. Jon, do you have anything?

AP MEMBER: Just one final issue regarding trends; I would like to express my appreciation to the council and also South Carolina for setting aside a pilot marine reserve program where our artificial reef structure is produced in deeper water. I think that has a lot of potential as utilization of artificial reef enhancement in marine protected areas.

I think it is something that is certainly lacking in Florida, but I think has great value particularly as habitat enhancements to the spawning areas. I think there was discussion of the Western Sambo Reef down from Key West and the Tortugas in 300/400 feet of water. Places like that I think could really benefit from design structures that would enhance the existing bottom topography; but we just seem to be moving forward. I think that is a potential trend that will have great future value off the southeast coast. That is my personal opinion.

MR. GEER: Thank you very much; any questions for Jon and Keith?

MR. GEIGER: Very impressive presentation. I guess listening to you it sounds like after 30 plus years of artificial reefs; is it a fair statement to say that the socioeconomic benefits is or are the prime driver for the artificial reef program in Florida?

MR. MILLE: I would say that is an accurate statement. Again, the primary purpose of most of the reefs or where most of the funding has been going has been public artificial reefs designed to be used by recreational fishermen and spear fishermen and to a lesser extent ecotourism has at least divers, particularly in clearer waters down south, southeast Florida.

DR. WHITTLE: I was going to say I do know – I don't know how common this is, but I do know certain counties like Sarasota County, they keep some of their artificial reefs private, secret. Those wouldn't obviously be used for recreational use.

MR. MILLE: In response to that; these permitted areas, most of them are not very large. Sarasota County, for example, they have a memorial reef program where they are allowed to use standardized reef modular units, which are consistent with the county's reef management plan and consistent with the Army Corps positions.

They may place them within a limited permitted area and may not necessarily advertise those coordinates to the public; although they are required to provide us like statues, the locations of these units. But they are designed not necessarily for public fishing reefs, more as a memorial reef; but they are integrated in with the county reef management plan.

A lot of people have sidescan sonar; and at one point back in 2003 we spent half a million dollars deploying 500 patch reefs across five counties in federal waters at unpublished locations as kind of take-back refugia areas. The fact is they have to be in permitted areas. What you can't handle is much larger size 44 square miles up to 77 square miles.

But again in recent years the cost of you run a sidescan sonar, you didn't have enough days where you just mow the yard and pick up a sound there. Being able to actually have unpublished artificial reefs that remain unfished is pretty remote, particularly on more urbanized area like Sarasota County.

In the Big Bend, we paid people who worked for the University of Florida as part of a research project. They got 500, almost 600 patch reefs deployed, which are unpublished and are being monitored for the long-term monitoring and research purposes by the university. It is only because that is such a lightly developed area that those sites remain unfished. I think having a marine protected area designation is really the only way you can have proper law enforcement to guarantee that these sites aren't going to be fished.

MR. GEER: Jaime, did you have a follow up?

MR. GEIGER: In terms of your achieving your biological objectives, after evaluating this program for 30-plus years, can you say that you've made any significant improvements in either native invertebrate or vertebrate species and/or populations that can be attributable directly to your artificial reef program?

MR. MILLE: Well, I think with regard to red snapper populations in the western Florida Panhandle, the fact that what is helping this; you know, the artificial reefs themselves without the necessary fishery management regulations – you've got high profile, complex locations where these fishermen are going to be drawn to; and if the fishing pressure is kept low – you know, from our tagging working and recaptures, you would see fish with some site fidelity putting on biomass, growing on these reefs; that if the sites are heavily fished, the exploit activity is neutralized.

Again, we can't necessarily satisfy multiple objectives. They can't be a source of productivity and yet also benefit a high-use recreational and diving community where they are a great socioeconomic and recreational benefit, but they are neutralizing in productivity because of the level up here. That is where fishing regulations, bag limits and season limitations come in and are very important.

MR. DODRILL: I think it depends on the species and the location and the fishing pressure. The work that Will Patterson did off the Panhandle; fishing pressure is so strong that any contribution, it just outweighs any contribution the artificial reef would like to claim. Now if you look at some other species that might not be harvested, such as pan fish or something; obviously we are improving those populations; but as far as the managed species, in many cases it is fishing pressure that is driving the equation.

MR. GEER: Do we have another questions?

AP MEMBER: I guess I have the same question but maybe a different way. Have you seen any result of lower productivity as a result of aggregating fish and making them easy to target, coming from that direction versus increased productivity. Have you seen productivity decrease in any areas due to increased fishing pressure due to the reef sites?

MR. MILLE: How are you defining productivity; are you talking about landings?

AP MEMBER: Biomass.

MR. DODRILL: Again, let's go back to a Gulf Council, a Gulf of Mexico situation. Since 2006 the federal government really ratcheted down on the – they went from four fish bag limit to a two fish bag limit and raised the minimum length to 16 inches. The last couple of years we've had like a 9- to 12-day red snapper season. The recovery process is pretty impressive on these artificial reefs.

I went out in July and I had my two fish bag limit; I got a 31-inch red snapper. The boat adjacent to us had six red snapper; the smallest was 31 inches, the largest 33 inches total length. We're talking 18 to 20 pound fish. You weren't seeing that a decade ago, but again the artificial reef is providing the habitat.

These fish are feeding both over and on and off the reef. It has actually reduced fishing pressure that everybody complains about, all the fishermen complain about; but that is what is resulting in a recovery of the fishery and not more artificial reefs put in the water, which would be heavily fished without these strong regulations. Of course, up east you guys had no red snapper season last year.

A recent video I saw just last week on a wreck in about 80 feet of water off Jacksonville there were red snapper in the video. This is the issue; that there was kind of a mythology out there among fishermen that more artificial reefs create more fish. That is not the case; it really depends on the species and life history aspects of the given species.

MR. MILLE: To follow up on that, we also hear a lot – we hear often if there are more artificial reefs, then they expect that there will be a need for fewer regulations when it is quite the opposite. In fact, the more artificial reefs the more accessible we are making the fishery to the public; there is a greater need for us to make sure that we have the proper fisheries management regulations in place. I think that is one of the biggest misconceptions that we see in Florida.

MR. GEER: Anne has a question and then Pace.

MS. DEATON: I'm just curious how you are able to get the counties to get the permits, because in North Carolina the state has to get the permits even if the project is done by a nonprofit group and we are liable. When the project is done, the state holds liability in case some accident occurs, if the buoys fall of. I'm wondering how you managed that; because it seems like a big advantage in a way.

MR. DODRILL: Again, this is a partnership that goes back several decades, back really to the time it was just one individual associated with the artificial reef program. Florida, unlike the Carolinas, we've got this dual coastline that is over – well, l if you count every little vein and everything 6,000 miles of coastline. What we've really relied upon is the local coastal government to assume the liability and the responsibility with technical assistance from us.

That seems to have worked okay with the state of Florida, but Florida is really unique. All the other Gulf States and the Atlantic coast states, the fishery management agency really is the responsible party. The benefit of that is that they really have a little more direct control over what is going on.

You wouldn't have these half million dollar art novelty projects coming out of the woodwork and being deployed if the state held the reef project. Even the county is holding them, if we go back to the late seventies early 1980s; a private individual could get a permit; a fishing club could get a permit.

The problem with that in terms of liability is private individuals disconnect their phone and move to California when a problem or something moves offside or the project wasn't deployed in the permitted area. The same with fishing clubs that disband; so from a liability standpoint as we move forward so that the county has – you know, they hold title to all the material that is ultimately placed on the bottom in their permitted areas and they have the liability regarding anything that happens that is not in compliance with permit conditions.

MR. MILLE: Maybe it's because our counties, some of the urban counties especially; they recognized the value of their marine resources and to date the counties have not had any objection to assuming that liability. In some cases some of these county programs are larger than our budget for Florida fisheries statewide. Palm Beach County, for example, their budget exceeds the amount of the grant money that we provide statewide.

MR. DODRILL: Some of these wealthier, your bigger counties, they've got ocean engineers, they've got marine biologists, they've got vessels, they are really equipped to effectively manage a local program.

MR. GEER: All right, we've got time for one more question; Pace.

MR. WILBER: At the Tallahassee level, is there any compilation of the maintenance schedules and maintenance activities for those reefs?

MR. DODRILL: Well, I guess could you define – I guess again going back to definitions, what is your definition of maintenance schedule or maintenance activity?

MR. WILBER: I work in the permitting side of the house and we regularly see federal public notices for refreshing these sites with new material. My question is, is there any way to get sort of a coast-wide perspective on what sites are going to be refreshed and when and what type of material will be put out there during the refreshment or is it literally having to go to each county by county to get that information?

MR. DODRILL: Well, in terms of refreshment, I think again after years we've moved away from materials that required "refreshment". Back several decades ago, they were using car bodies and such as washers and driers and other ten-gauge metal materials. Yes, those reefs require refreshment because the materials either moved or were buried or just disintegrated.

But you have a vessel that has got an inch and a half thick metal hull that will be there 70 years from now; that doesn't require refreshment. You've got these modules that weigh several tons that have been evaluated based on the best place for stability. They are going to be there for decades. The old concept of refreshing materials that are going away is probably a little bit passé. What they're doing now is just placing additional patch reefs at additional locations within their active permitted sites; basically build out the site. I think it is a little bit different than refreshing a reef.

MR. MILLE: I think what Pace is also asking about is what is the long-term future management? I think a long-term management plan, what is the future view of an artificial reef in the region; I think that is something that a lot of our counties struggle to deal with. Unfortunately, a lot of the funding and even some of the materials are opportunistic.

Many of the counties, regrettably, I don't see them laying out detailed master plans, so it is really not possible for them to know what the layout of the material is going to be until they've identified funding and then they've identified the materials. I think that is something that needs to be improved upon into the future.

MR. GEER: All right, we have to start moving on. Gentlemen, I want to thank you very much for a very informative presentation. We really enjoyed it and it is really interesting. I could talk all day about that relationship between you and the counties, because that kind of really intrigues me. We need to move on now. We're supposed to be on break now but can we go another ten minutes to talk about the policy statement and then have a break? Is everybody okay with that?

MR. PUGLIESE: Let me jump in because I think kind of bring it into the context, because there are relationships of what we're working with, one of the first things is that we do have a team specific to the Fishery Ecosystem Plan that is going to be updating artificial reefs, and our Florida presenters are participants in that as well as a number of the members here – to really to be able to take what was in there and very specifically update and refine the operations of the individual states to get into some of this level of detail we're discussing now to make it clear where things are, to advance and expand our spatial information that we have presented through even our council site that includes everything from the distribution information; like get into and work again with the partners to get everything from video to imagery connected to those, to expand that information system for artificial reefs.

Artificial reefs are essential fish habitat through the council and the designation of special management zones for artificial reefs; also provide those as designated essential fish habitat areas of particular concern. This is an important aspect. The council has discussed this in the past. They are advancing this because of the roles that artificial reef plays in our region.

To that degree, the discussion on advancing an artificial reef policy was where we started, where we're moving and this is the opportunity to look at how these types of activities both provide information on use. I think one of the important points that Jon and Keith had made is about some of the use information, non-consumptive use; some things I think that you can get from the artificial reef component that we don't necessarily get from having a broader scope; and that is a major part of the directives under fisheries management.

It is not just the access but also some of the non-consumptive, which are some of the tougher ones to get a handle on. I think that is a major goal. The research involved, again going back to some comments about getting to life stage capabilities; I think some of the individuals in the world, Japan and elsewhere have gotten to the point where they are designing some of these structures to get into multiple life stage capabilities on that. I think there is opportunity to look at that.

That all has a significant role when it gets to some of the more recent opportunist efforts with the last iteration of the council designating the deepwater artificial reef – the Charleston Deep Reef is an artificial reef – the opportunities to expand and enhance the materials in that are huge. It is a very large area so there are opportunities to do that.

The state coordinated a private effort that provided a pretty significant barge distribution into the deep artificial reef area. There is ongoing effort to advance those; and what would be really good is to, as these move forward, be able to look at opportunities within those areas, but also take some of the technology in the newer capabilities to advance that; so the policy to maybe add some of those types of capabilities.

We've had a more recent situation with the state of South Carolina. The Corps of Engineers has a large amount of material they would like to be able to place in one of the newer deepening areas closer to the front end of the system. The opportunities; they were investigating even the potential designation as special management zones.

There are some new real advancing efforts that I think are going to be helped with a better understanding of all the different systems; a real refinement of the research, because a lot of the

life history research and different things we talked about all the different organisms; I think some very detailed information is going to be useful to advance that in the foundational; and then how that can go into advancing any other policies at the state and through the council efforts into the future.

Where we're at is the opportunity to work with the group that is refining the artificial reef section; and those are the core people that will have some of the information to set the foundation for a framework. The next stage will be probably getting a frame based on the way we've developed policies in the past; work with that group as an additional task for discussion, and then advance this to coordinate with the advisory panel and move the process forward. I think that is where we stand with the first stages, next stages and advancing the artificial reef policy.

MR. GEER: Do we want to develop a policy team at this time?

MR. PUGLIESE: Yes, I think we can. As I said, I think one of the keys is going to have the key state individuals that are on the artificial reef group or the artificial reef review group itself provide the core of that team with additional, maybe participation from other individuals on the AP that are not on that team to advance this.

We can look to that group as the initial or at least core individual state representatives or local representatives, the core, and then how we expand that to get the groups that we can come up with a first iteration of an outline draft that they can advance to the AP and then to the council. Why don't I put it this way, think about it and we can see if that can be the recommendation that comes out of this group or we could actually identify that we can have discussions and identify; look back at actually the participation in there; identify that and then see what other individuals would like to contribute on the early ends.

MR. GEER: I'll talk to the state leads. You could probably give me a name and we'll go from there. I already have some input on who are going to be the folks to do it. At least they'll be the ones to start helping us.

MR. PUGLIESE: That would be good to have that integrated into the report to the council, because we're going to have the report out from this AP meeting to the December council meeting.

MR. GEER: Fine; so we'll try to get those names as soon as possible. Anything else?

MR. PUGLIESE: Not right now. Again I thank John and Keith and everyone for the presentations and everybody's patience on going a little bit further into here. Let's go ahead and have a break and then we'll come back into.

MR. GEER: We'll be back at 11:15 and Brian will have a report. Moving on, we're about 25 minutes behind schedule. Next we have Brian Hooker, who is up from BOEM. Brian, welcome to the committee. You come and present once and look what happens; you get on the committee. You learn your lesson when you get a little bit older not to do those things. Brian is going to talk to us about the South Atlantic alternative energy activities. I guess his presentation is up, and, Brian, you have the floor.

MR. HOOKER: Again, thanks for the opportunity to give you a quick update on where we are with the renewable energy program in the Atlantic. I am going to briefly go over the entire Atlantic and then spend a little more time on the South Atlantic. Again the stages of development, just to refresh your memory, the first stage is the task force meetings; identifying the wind energy areas.

After that is leasing; and then we get into site assessment and then only after that do we get into the Construction and Operations Plan. Here is just a brief overview of all the sites on the Atlantic so far. I'll get into these into more detail. Here we are in Massachusetts and New York. Starting from the far right of the screen you will see we had a lease sale for what we call the Massachusetts wind energy area. We had an auction for all this area.

These two areas did not get auctioned; there were no bids on them. These two areas were auctioned; and currently this one, Offshore Megawatts won the options for this site and Red America and then eventually Dong Energy based out of Denmark won this one. These two areas have been leased. These two areas have been leased to Deepwater Wind. Deepwater Wind is the same company that has done the state waters pilot project right off Block Island.

Those foundations have been pile driven as of October 30th. All five foundations have been pile driven. Then here in New York we're still actively – I just got back from meeting with fishermen on Long Island. We're in the area identification phase for this area. We haven't begun the EA process for analyzing this or even defining what part of this area will actually be leased. Again, there is the New York area for context.

I would just like to say this is a VMS map for all fisheries. We just held the auction for New Jersey. There are two areas that were leased. I am going to forget now who won; it was Red America won I think the north area and I forget who won the south area. The Delaware Site was leased quite a while ago. It is kind of in a holding pattern at the moment with the developer requesting an extension on their lease.

The Maryland Site – this site was leased to U.S. Wind. As a matter of fact it was U.S. Wind that won the south. The same company that just won the auction here has the lease rights for the Maryland Site and they just completed their site surveys this past summer. Moving down, it is kind of really, really hard to see here; but here is the proposed Val Tap Pilot Project Site with the proposed cable route going here.

The commercial site is in yellow, but it is this right here. Where we are right now with that is we're still reviewing a site assessment plan and we're reviewing the actual – finalizing the EA for the whole RAP, what we call the research activities plan, which is equivalent to basically their construction plan for the pilot project.

Here is the Kitty Hawk Site; this is off of North Carolina. Now we're getting just a little closer to the South Atlantic. The North Carolina areas have gone through area ID. Their next phase is actual leasing. A lease sale date has not been determined yet. Again, here just a close-up of – this is what the original Kitty Hawk area looked like and this is what happened after area identification. We just went with that small area there. Again we kind of completed everything and just in the process of trying to establish when an auction might occur.

Again this is Wilmington East; and again just showing you what the original site was and was eventually selected through various applications. Here is Wilmington West again, the red outline being the original area and then what won out. This brings us to South Carolina. South Carolina is in the very early stages of planning an analysis through the South Carolina Task Force.

No area identification has occurred yet for these areas, so these are still very much in flux and under discussion as we speak. This is what the task force has kind of come up with thus far. You can see the Wilmington, North Carolina, area is up here.

AP MEMBER: Brian, who decides who is on the task force? Who coordinates, organizes or something for the task force?

MR. HOOKER: All federal agencies are on that. The federal service agencies, Fish and Wildlife Service, National Marine Fisheries Service, BOEM. We invite Army Corps of Engineers and the Coast Guard as well and DOD are all invited. They participate as they are able. Then the governor for the state assigns their governor's representative. Any questions about this. This is kind of newer information. I'll pause here for a second.

MS. DEATON: For North Carolina, the Wilmington east and west, what did you say the state is at – I mean, where are they at? They are at the point of leasing, right?

MR. HOOKER: Right, they are at the point of leasing. A proposed sale notice is the next stage and a proposed sale notice hasn't gone forward yet. They are in the process of kind of identifying what that timeline would look like for a proposed sale notice and a final sale notice. That would eventually end in an auction after the final sale.

MS. DEATON: I've been hearing locally – I mean a lot of these towns are doing petitions opposed to it. Does that have any influence on whether it happens or not?

MR. HOOKER: Yes, we did have a meeting in Bald Head Island just recently. I think there is are some constituent concerns in Bald Head Island that we're evaluating while we're kind of in the approach period. That is where we are; we are listening to those concerns.

MR. WILBER: Brian, just to sync up with the NEPA process; you have not finalized the EA for North Carolina yet, correct? I mean, you did a draft EA last December. You got comments on it, but we have yet to see the final EA for North Carolina.

MR. HOOKER: I think you're right, yes; we haven't yet issued that revised EA. I think that is where some of these additional comments would get incorporated in that revised EA.

MR. WILBER: Now, will you finalize the EA before you announce the lease sale date?

MR. HOOKER: Yes. Thanks for that reminder. This is off of Georgia. This is the proposed Met Tower that Southern Company has proposed; this has been kind of an ongoing project. It hasn't really changed since last time I updated you. They are still – we're in the process of finalizing our biological or finishing our ESA consultation on this project. Once that ESA consultation is complete, we'll be able to finalize the environmental assessment, which is analyzing just a buoy for a Met ocean tower in one of these three blocks.

Again, this is what we term an interim policy lease; it is kind of a holdover from before we actually had implemented our regulations. This type of lease will not result in any commercial development in any of these three blocks. That would be a whole separate process, but Southern Company really wanted to evaluate the wind resource and that is what basically the project is, is trying to put a tower out to see what the wind resource is out there and see if they want to continue with maybe pursuing a commercial lease at some point at a site that would still need to be determined.

Off of Florida we're still waiting on a revised project plan from Florida Atlantic University. The Southern SNMREC, I forget what the acronym actually stands for. But again this is for our marine hydrokinetic demonstration site. Again interim policy; this is just a testing facility, not commercial, no power line inshore or anything of that nature. I can do the rest from my seat.

I just wanted to give you a quick update on some of the studies. One study I know that you're probably interested in is there were a Benthic Habitat Study and a fisheries' study that were done by the state of North Carolina and National Ocean Service. That report is in its final revision stages actually with the National Ocean Service.

We hope to have that out in the very near future. That was primarily surveying in the Wilmington West and Wilmington East areas. Just some other examples of things we're doing; the first one up there, the Fishery Benthic Habitat Data Collection Program, this is with the NMFS Sandy Hook Lab doing most of the wind energy areas down to Kitty Hawk.

They were actually in the Kitty Hawk area just this past summer surveying that area. Further north we have some lobster ventless trap surveys; and in Long Island this summer we kicked off an EMF, an electromagnetic field study, looking at the Cross Sound – there is an existing buried high- voltage direct current cable in Long Island; and we're doing some analysis of that and doing some cage studies over that to look at the reaction of different electro-sensitive fish species within that Penn Study.

Here is just an example of some of what the Northeast Fisheries Science Center is doing on our benthic habitat mapping. You can see the North Carolina call area there or the Kitty Hawk area in the far right; some of the survey stations they did and some of the data that they had. Again this is just a Maryland area. This is more of a finalized product that they developed for us to show some of the important areas within the Maryland area. This is something that they'll do for North Carolina call area as well.

You can just go ahead and skip to – well, I'll mention one on here. We're doing some – in partnership with the Navy, we just kicked off an Atlantic sturgeon Habitat Use Project that will be off of Virginia looking at the Virginia lease area and the cable route to shore and that area. This is using acoustic telemetry to understand sturgeon habitat use in that area. Carter here is the partner on that project.

There is the picture showing the Navy's existing array and then some of our new arrays that we'll be deploying in the near future. Another study that we're finishing up was looking at revenue from each of our wind energy areas; basically from Massachusetts down to North Carolina. This was an interesting study that really emphasized the value of using observer data and VTR data and dealer data to get at the actual value and location for different fisheries.

If you go to the next slide, it gives us a good idea of what our average annual revenue from each wind energy area is by FMP; and then on here I have by council. For that area from North Carolina up to Massachusetts, there is really only two South Atlantic Council species that made it into that list; and that was king mackerel and was it vermilion snapper down there at the bottom.

MR. PUGLIESE: That is commercial only, right?

MR. HOOKER: Yes. Obviously, this is only people reporting into the VTR system; with all the caveats of VTR data. This is just an example of the project off Block Island. That is the pile-driving hammer about to get lowered over top of the pile for Jacket Foundation off Block Island. This is actually what happened this past summer.

That jack-up barge came around from the Gulf of Mexico; and this is a small one. When they actually get closer to adding the turbines – these are 6 megawatt turbines they're going to be putting on here – there is going to be a much larger jack-up barge that they're going to have to use to install those. Okay, that is all I had.

MR. GEER: Thank you very much, Brian. Any questions for Brian?

DR. SEDBERRY: Regarding the acoustic telemetry work on Atlantic sturgeon, is BOEM funding that?

MR. HOOKER: Yes; it is BOEM and the Navy is kicking some in-kind funds as well.

MR. WEBB: Obviously, we're just at the beginning of looking at these resources and their impacts. What kind of studies are being done on thresholds where the creation of these farms, either the hydrokinetic or the wind, actually start impacting natural phenomenon; the speed of the current, the volume of the current, either wind or ocean?

MR. HOOKER: That is actually a good question. We have one project now that is trying to look at doing a nested model with turbines in place to see what the results are. That is due to be out in March currently. Because of where the data was richest, it is primarily looking at the Rhode Island and Massachusetts area currently.

It is doing exactly that; it is looking at what the existing currents are, how they would change, if any, due to the placement of the foundations in that area. That is a question that we are often asked. There was some preliminary work that they did like they looked on the modeling. They want to do some stochastic events like a hurricane or a nor'easter; and they did some modeling with that. It is still being refined.

MR. WEBB: I've got a follow up. Is there a plan? Is there an intention, I guess, to try to establish some thresholds other than the limitation of the leasing areas filling up? At some point in the process; will that be an ongoing evaluation to see that even if we have more land available in a leased area, we're reaching a threshold where we're starting to actually divert natural phenomenon and so we're going to stop that? What is the view? What is the process of the teams that are looking at this and evaluating it? Is that something that is being talked about, establishing a threshold other than just running out of space to put it on?

MR. HOOKER: No; I don't think there is any effort to establish like we will not build a project if X threshold is crossed. I think the director would evaluate all of the information that is presented and make the best decision based upon that information. We've gotten the same question on fishing revenue impact; is there a level where the revenue reaches something that we would say, no, we're not going to impact that. No, there is no effort to establish we won't go beyond that. The environmental assessment; we are required to evaluate what those impacts are in a public, transparent way. That definitely helps influence the final decision that is made.

MR. PUGLIESE: Yes; as part of looking at the physical characteristic study on that; are they also looking at the sound before and after type of capability to understand if there is a persistent sound? I mean, one turbine in an area versus an entire area, the idea of any kind of background sound has some pretty significant implications for at least in our area on settlement of snapper and grouper in the nearshore areas. In that; is that also being thought about at least to begin that process of looking at what the sound character is and how that may change over time?

MR. HOOKER: Right, we have some operational sound data from Europe that we have looked at. You probably won't see that until we get closer to what we know the foundations are and the types of turbines and the spacing and that type of thing. Most of our sound work right now is on survey equipment. We do have several studies out now. For pile driving and before surveying, they are required to do sound verification studies.

We do have another study that is trying to basically do a proof of what all these different devices are going forward. We have like a basic working document for all types of different survey devices and what their sound characteristics are. But operational noise, we can talk about it but there is data from Europe.

MR. GEER: Any other questions? I've got one from Jaime.

MR. GEIGER: Yes, Brian, based upon your experience to date, if you had to put your predictive hat on; are you seeing more interest towards hydrokinetic activity or wind tower or some alternative at this point in time?

MR.WILBER: Yes, the wind turbine technology is the furthest along, so we're definitely seeing even more interest in that. I think what I've found interesting is that I think earlier on we were thinking that on the west coast we would see hydrokinetics really pick up because the shelf drops off; but instead we've actually seen a lot of technological advances in floating foundation technology.

Even on the west coast, one of the earlier projects that they're looking at right now or one of the pilot projects is a floating turbine array. They do have a pilot project for a current turbine or a tidal – no, it is a current; it works on the wave action turbine; but they seem to be making even more headway in moving into the floating platform, which does expand the horizon of where you could place these if that technology advances. You really do open up and there is a cost implication for that, too, where people can just drag something out to the site versus bringing all the equipment and pile driving it in place.

MR. WILBER: I just want to add to that. BOEM's focus though is on federal waters. Wind or hydrokinetic that is occurring in state waters would largely be outside of BOEM's purview. But

it would be under the purview of the Federal Energy Regulatory Commission, FERC; and FERC does have a website where you can look at all of their hydrokinetic projects. They have an interim lease program and they have a pilot lease program and it is kind of similar in concept to what BOEM has. But there are a fair number of hydrokinetic projects at inlets in the Carolinas and Florida; but because they are not in federal waters, they are outside the BOEM umbrella.

MR. HOOKER: Yes, thanks, Pace. Even this project here, this is in state waters so BOEM isn't the lead on it. It's the Army Corps of Engineers on that one and FERC would have the lead on commercial hydrokinetic projects.

MR. GEER: Nothing else? Thank you very much, Brian; appreciate that update. Can we do this in ten minutes?

MR. PUGLIESE: What I want to do is just walk through what we have as the standing redrafted energy policy that has advanced and just at least to get that on the table so that we start the process and then we can follow up with discussion after lunch. What I wanted to identify is the work that has been done as an ongoing effort, building on a pretty significant document that was adopted by the council a number of years ago; and advancing with – especially taking on new technologies, status of other activities to move forward in recommending the most updated policy information.

In order to get this process advanced, what we did was created a new team for review, which constituted Jocelyn Karazsia as the lead with Habitat Conservation, National Marine Fisheries Service, and engaging our subpanel chairs and other expertise to be able to refine, update and advance the latest policy statement.

You just received that in an e-mail, and it is the November version. What this did is a number of things that occurred are we had reorganized the entire document so that you would have essentially three main sections in the body. We have EFH at risk, we have threats and then the policies and best management practices are also subdivided.

That helped really eliminate a lot of the repetition that was in the previous document, so that helped advance that. Also adding some more – at this time I think up to 30; I think there were 30 references added for additional justification for some of the policy and threat suggestions. But there were a number of them that are still identified, and what we will do is look to try to add those if possible to enhance those recommendations or those threat identifications.

With that, let me just walk quickly through the structure; and then as I said, we'll identify where we are and then move it forward. One of the first things this does do is it identifies its connection to the original Habitat Plan, to the Comprehensive Amendment and to the Fishery Ecosystem Plan, past.

What it does also do is identify the whole scope of different areas addressed from wind, oil and gas, methane hydrate mining, estuarine marine hydrokinetic, LNG with the natural gas, regasification, pipelines and offshore and onshore facilities and onshore power plants. The first section of this document provides the essential fish habitat areas at risk. I am not going to get into all the details.

And again a lot of it really is picking up – there was a lot that went into the original policy statement, because the council had gone through a number of iterations of working with activities that were proposed all the way back to when they were even talking about drilling in the Keys many, many, many years ago and to two different iterations at least of proposals off North Carolina.

That has been evolving and provided the foundation for the initial document, and this is a refinement. This provides the first EFH areas at risk; and, of course, on the front end it identifies the core areas for bottom habitats, coral/coral reef live hard bottom as potentially at risk with oil and gas exploration.

It provides the different nearshore riverine and wetland habitats. Again, I am not going to go through all those; we can touch those as we go forward. Most of these were identified in the previous updated with the more recent designations, so everything from water systems to riverine and wetland areas that have been identified as EFH.

What it is doing is it is connecting EFH designations with some of the specific activities. The areas that are identified specifically to siting activities are included. This is where we had already built this, and this refined and updated some of this where it is addressing all species in the South Atlantic region, so it goes outside of just the South Atlantic species.

It identifies species like summer flounder, bluefish. It gets into other snapper grouper species, black sea bass, penaeid shrimp and coastal migratory. Again, this is an iteration of the EFH designations for those various species. It is identifying the core habitats that are potentially threatened by various areas.

Then what this did is this section here, it used to be a large listing of the areas, essentially identified the HAPC, the activity and connected it very specifically to the FMP that essential habitat designation, so, for example, nearshore hard bottoms, EFH/HAPC designation under snapper grouper and potentially LNG regasification and pipelines and power plants.

This goes and proceeds through any of the specific areas that had been identified and connects them to the FMP and the activity. One of the other areas that was identified was also highlighting the connection to state-designated areas, and this gets into the discussion here where it talks about the critical habitat designations or strategic habitat areas that were designated either by the state or the Atlantic States Marine Fisheries Commission; integrate those into the areas potentially that are threatened.

Now, there was a comment through the team and through Jocelyn about a clarification of that. I think one of the things – I'll talk to Pace, because one of the things we did on the last round, when we were trying to refine the EFH information, was very specifically lay out the suite of all the different areas that that included with specific state water designations, et cetera.

I think that is the broader definition that can encompass all of those types of habitats. This actually gets into the specific activities that were identified as threatened issues with regard to in this case direct mortality; from dredging, drilling, trenching, installation of facilities and operation. This walked through all the different components of potential threats; the second having to do with the sediment deposition, chronic elevated turbidity, and direct mortality of

eggs, larvae, post-larvae, and juveniles from spills, alteration of the nearshore; so it does get into that idea of connecting into the shoreline areas, risk associated with directional drilling as part of this.

You're talking about connecting a number of other types of habitats once you start doing that and other things that can happen with releases from those such as frac-outs. Conversion of habitats; that is the discussion we had before; the transfer of soft bottoms to artificial habitats or structural habitats, the conversion from one use type to another and what the implications may mean for that.

This has to do with the actual placement of materials where you would have creation of anchor systems and what that may mean if you were having movement or shifting associated with those types of capabilities. Also, it gets into very specifically any of those types of shifts on any structural location that would be designated or created.

Tying impacts on any of the flows, timing of river flow systems and blockages, reduction in areas and tying it back to any critical spawning time; alterations of any community or food web, energy flows, effects on fish behavior and health. It gets into some of the details about the impacts relative to the riparian zone, the coastal zones from thermal pollution and any of the nekton entrainment or impingement that may occur in that.

Impacts to power plants and cooling activities associated with that and the water quality, both temperature and salinity affecting the nearshore communities and interactions that ultimately look at the cumulative and direct lethal and sublethal, the bigger, kind of the combined effect of all those.

That essentially led to the policies; and this is drawing on and expanding from what the council policies had been created before. It includes avoiding and minimizing where possible offset damage for EFH/HAPCs, CHAs and SHAs be accomplished and integrate best available and least impact the technologies; avoid intersection with allowable fishing areas within Deepwater Coral HAPCs, all facilities associated with energy exploration, development and design to avoid impacts on coastal ecosystems and sand-sharing systems.

The projects comply with the existing standards and requirements of regulating domestic and international transportation of energy projects and regulated waste disposal emissions intended to minimize negative impacts and preserve the quality of the marine environment. Open loop LNG facilities be avoided and in favor of closed loop systems; and water intake associated with the closed loop minimized the effects on fishery resources.

Pilot-scale projects should not occur in areas where full-scale efforts are predicted to be environmentally unviable. In advance if you know that those areas are going to be not likely to be developed, not to try to set policy. In the EFH review and administrative policies, identify – now this is where we had discussions of making this more useful in that arena; so it got very specific to some of the recommendations relative to EFH assessments and ongoing project recommendations.

In here the EFH assessment for energy-related projects, you would have a description of the proposed action, analysis of the efforts, including cumulative effects on managed species,

associated species by life history stage; again, that mandate under Magnuson to try to get to that level of information, as well as the federal agencies view regarding the effects of the action on EFH and any proposed mitigation.

Projects requiring expanded EFH consultation, provide a full range of alternatives; and this is again getting very specifically to trying to identify if there are going to be impacts on essential habitat areas of particular concern or state-designated areas. The expanded EFH consultation would allow NMFS and the Federal Action Agency the maximum opportunity to work together to review that information and develop the specific conservation recommendations.

Impact evaluations include quantitative assessments of each habitat based on the scientific studies; and all EFH assessments should be based on the best available science. Assessments should be produced for information gathering the best available technologies also and map and characterize habitats; that is a key part of this.

Impact avoidance and minimization accomplished by tying it to existing transportation, trying to take advantage of existing facilities versus creating entire new routes that would go through either sensitive habitats or have significant impacts. The effects of sound on fish behavior and health should be considered in EFH assessments prepared for any seismic survey.

As you all remember, the council had weighed in and went directly to the head organizational component of BOEM with regard to seismic surveys in any of the seismic survey activities in the southeast, taking account the broad array of essential areas of particular concern, spawning habitats and other habitats that were identified as important in the South Atlantic region and all managed areas.

This issue is a big issue later on, too, compensatory mitigation should not be considered until avoidance, and that was a really big thing is to try to do as much of the avoidance and minimization in advance and compensatory mitigation be at the last stage of any process. Modeling efforts fully characterize the assumption applied for any potential biases that may affect any of the results.

The determination of the physical and chemical oceanographic and meteorological characters seeks the area through field studies by BOEM, other agencies, academic applicants, including onsite direction and velocity currents, tides, sea state, temperature, salinity, water quality. This gets exactly to the type of discussion we were having about getting that context of the entire character of the system in advance of moving any of these types of energy systems, so you know the entire physical characteristics of the system and would know what potentially some of the things such as spills may affect those.

The EIS statements, EAs or EFH assessments for any lease/sale address impacts from activities related to natural gas production. Safety precautions required in the event of discovery of any sour gas or hydrogen sulfate reserves in the EIS as well as the implications of any of the transferred by the Gulf Stream or any of the spinoff eddies.

In the EIS or EA or EFH assessment also address the development of contingency plans implemented if problems arise during any oceanographic conditions or bottom topography and need for the availability of onshore support facilities in coastal areas. I know I said I wouldn't

go into it, but I think these are the main policy points here. I'm doing them fast enough that at least it gets a feel that we have. I think it is important to at least touch on these and then we can get into detail later.

The licensing policy and best management practices are an adjustment of what we had before, but it gets right to some of the key things. License or permit decisions should be based on geotechnical studies completed to ensure that the geology of the area is appropriate for construction method and the geological risks are appropriately mitigated.

The adequate spill containment and clean-up equipment be maintained for all development facilities and equipment be available on site or located as to be on site within the landing time trajectory. Environmental bonds are required to assure the adequate resources will be available for unanticipated environmental impacts, spill response clean-up and environmental impact assessment.

Exploration and development activities should not be authorized during migratory patterns, breeding and nesting seasons of endangered or threatened species; included but not limited to northern right whales in the coastal waters off southeastern United States. Licenses and permits clearly describe pre-project, project-related and post-project monitoring in sufficient detail to document the pre-project conditions.

Initial long-term and cumulative impacts of the project on EFH monitoring is required for the life of the project, and the method should reflect input from research trustees conducted by the experience personnel. Third party environmental inspections are required. Hydro test chemicals that may be harmful to fish and wildlife resources should not be discharged into any U.S. waters.

Licenses or permittees that require all work vessels associated with construction traverse any reef systems or sensitive habitats are equipped with standard navigational aids, safety, lighting, communications equipment and equipment such as tow lines secured during transit; and vessel monitoring system with global positioning employed to continuously monitor all movements of vessels associated in real time. I am almost to the end of this.

Any anchor placement, completely avoid corals and be diver verified; in addition measures to avoid anchor sweep should be developed and implemented. Appropriate exclusion zones should be designated around sensitive marine habitats. A contingency plan should be required to address catastrophic loss or more chronic material losses from LNG facilities, including trajectory and other impact analysis as remediation measures and responsibilities.

Licenses and permits require the development of resource sensitivity training modules specific to each project, construction procedures and habitat types found within the project impact area. This training should be provided to all contractors and subcontractors in areas adjacent to or that have support sensitive habitats. That is the context of the entire policy.

I apologize for getting into more detail than I really wanted to, but I think it was quick enough to be able to really see the context and new layout, the way it moves directly into the individual policies and even specifically recommendations on the licensing on the EFH and EA development to the future.

MR. GEER: Thanks, Roger. We're going to get more into this this afternoon so save your questions for then. I'll give you time to read it over again. I'll take one question, Brian.

MR. HOOKER: Yes, there is a process, so what is our charge with this; is it just providing recommendations?

MR. PUGLIESE: The quick answer is yes. The policy statements and our advance through usually collaborations either through the entire advisory panel or a subgroup that brings it to the advisory panel; refine that and then provide it to the council for consideration for approval and adoption as a standing council policy statement. This is the time where there are areas to adjust, refine, make recommendations to do that. That is where the AP has the ability to package it up. That will be added to the report out to the council in December.

MR. GEER: Jocelyn had some questions she wanted us to address so we can do that after lunch. The bad news is we went over 15 minutes. Let's break for lunch if there is nothing else at this time and we'll meet back here at 1:45 and we can crank this out pretty quickly this afternoon and then break into our workgroups.

(The meeting recessed at 12:15 o'clock p.m. and was reconvened at 1:45 o'clock p.m.)

MR. GEER: Right before lunch we were talking about the Energy Plan. Marcel, would you like to introduce yourself to the group?

DR. REICHERT: Marcel Reichert. I am not a member of the AP. I was in a SEDAR 41 webinar this morning, so I apologize for joining you late today. I am with South Carolina DNR.

MR. GEER: Marcel will be very heavily involved in the research section tomorrow. I hope everyone had at least a chance to peruse through this document. I know Jocelyn had some questions for the AP, but I would like to open up the floor for any comments you have to start with. Any editorial things I guess you could pass them on to Roger or myself or Jocelyn. Let's open the floor to questions. I've got Jaime and then I've got Tom.

MR. GEIGER: I guess my first read of this was I was trying to determine what the jurisdictional area of concern is on this document. If it is just dealing with the South Atlantic Fishery Management Council jurisdiction, it is one thing; but it seems it wants to get heavily into state waters, rivers, estuarines, wetlands, and so on.

I am not saying that is a bad thing; but if you are going to be all-inclusive, I think the document probably needs to be beefed up more with state data and some additional citations and right up front acknowledge that is what this document is supposed to do. Right now it is sort of – in my perspective it sort of treads a little bit on both. Again, it may just be my perception on that one.

MR. PUGLIESE: When you talk jurisdiction, the council's jurisdiction over fisheries' regulatory jurisdiction is 200 miles and then some species all the way to the Gulf; and wahoo all the way up to Maine. However, with the mandates under essential fish habitat, those designations go all the way up into the river systems and far beyond.

I think to meet that congressional mandate, these are intended to address habitats outside of the regulatory side; and where we have EFH and EFH/HAPC designations up into state waters and into river systems and even think about water flows and far beyond that. As you look at any of the policy statements, most of them are trying to address that.

That is why you see those EFH at risk include all those. That has been addressed; and to some degree about the level of detail, there was a lot of discussion before about relying a lot on the technical information that is in the ecosystem plan, habitat plans, a lot of supporting of those designations versus really trying to focus a lot on the policy and advance it so it is on the EIS policy, licensing and things that are going to be immediately targeted to try to do this.

Otherwise, it ends up being something that becomes a lot longer and a lot more detailed, getting further away from being more of a technical document versus a true policy statement direction. Pat may add or other members may add kind of how it has been moving further that way and make it shorter and more operational.

MR. GEIGER: That is very helpful for me to understand this in a bigger context. I guess again whenever I see a policy statement, the first thing I'm asking myself is why do we need a policy? Why are we doing this policy; and if I look at this, I don't necessarily see that right up front. If it is in response to increased energy development and research and everything else, let's put it right up there – you know, why are we doing this – and make it very clear to I think the general public, because the general public is also going to be looking at this document as well. Why are we doing this policy; why is it needed now?

MR. JONES: My question relates to something that I didn't see, and this deals with drought situations. When we had our drought five years ago, it dramatically affected water flow, estuaries, habitat; and we didn't make mention of how policies might should change if we have a drought and the impact of inland drought on estuaries, water flows.

MR. GEER: Yes; it is probably in the in-stream flow policy. We have an in-stream flow policy; it is probably in that. It should be online.

MR. PUGLIESE: I think that is one of the things that is also an effort we've tried to partition off these, and there may be some connection between the different policies but trying to get directly at in-stream flow. All the different aspects of in-stream flow is the one that we approved; that the AP has revised and updated and approved earlier this year.

That is online with all the other policy statements, the updated policy statements. That will be integrated in there, so it does get into discussions about natural issues, natural events that are driving the baseline of the stable state that we know.

DR. WHITTLE: I know that Lisa Gregg from Florida was heavily involved in this, and so we have two minor clarifications and then a possible citation for you. I will send them to Roger.

MR. GEER: Like Roger said, the idea behind these is to have them be general enough – because you could see these things ballooning into massive documents, and you want them to be relatively short. I think I said as a guideline under 20 pages. Most of the ones we've done, I don't think we've had any that have been much longer than that.

It is something that you could hand to somebody and they can read it relatively quickly. They are rather broad. They try to hit on a lot of different topics. I believe we took hydroelectric out of this entirely, didn't we?

MR. PUGLIESE: Yes.

MR. GEER: At least I think the commission has dealt with hydroelectric in their habitat work, haven't they? There are other source documents for some of these things and we've talked – just this morning we were talking about for some of these things trying to bring in those other source documents from the commission or other groups that may have done these things instead of trying to reinvent the wheel in a lot of cases. Some of this has already been done. If nothing else, just referencing those in our documents maybe, so any other questions, comments?

MS. DEATON: I noticed there was a question in the document and it was about the critical habitat areas. I think the question was like do any other states besides North Carolina have designated critical habitat areas? I was wondering what the answer is from South Carolina, Georgia and Florida.

Also, I was going to say that in North Carolina we really don't have critical habitat areas anymore because they modified the rule. The way the rule book had been is it said critical habitat areas; and then under that, it included the primary nursery areas. It included SAV. It included anadromous fish plenaries and it included oyster beds. It was pretty all-inclusive.

It was really like habitat definitions; but they changed critical habitat areas to just habitat areas. Referencing CHA probably is no longer relevant or not with a capital; so I would call them critical habitat areas with a small letter unless other states have designated – so we still have P and As and we still have anadromous fish spawning areas, but they are the designation and not critical habitat areas.

MR. PUGLIESE: Yes, to that, I think that was specifically intended to identify the states use of that. If that is no longer used, then habitat areas would be appropriate. What I would do is wanted to bounce this to Pace, because these were intended to come – the way the council intended were any state designated areas.

When we had discussed this before, a lot of the sub-river systems and different things that are designated as waters of concern – I can't remember what the original designation was – a lot of those got folded in under that designation clarification. It was really trying to track where states had identified areas that were of significant value. So it included now; I guess it would be habitat areas for the state of North Carolina and then – Pace, that is not correct?

MR. WILBER: This is my recollection. A few years back we wanted to find out what state-designated nursery area meant, because that appears in the Habitat Plan, FEP and in the EFH designations. We went through a process and discovered that state-designated nursery area included probably a half dozen, maybe ten different designations in North Carolina; the big marquis one being primary nursery areas and secondary nursery areas.

Inside South Carolina they have outstanding resource waters that are designated for a suite of reasons, one of which happens to be their function as a nursery habitat. We felt comfortable

saying that the estuarine outstanding resource waters in South Carolina are state-designated nursery areas. Georgia had no special designation of anything. I think they had a process by which something could be designated, but they hadn't actually executed that process in Georgia.

Florida has aquatic preserves and outstanding Florida waters. One of the reasons a site can be put into one of those two bins is because of the nursery habitat function. We were comfortable saying that the estuarine and marine OFWs or state aquatic preserves were state-designated nursery areas in Florida for the purpose of implementing EFH regulations.

Now this is where I am probably the most fuzzy in what I recall but I thought under the North Carolina Habitat Plan there was an emerging process of designation critical habitat areas and that it actually hadn't spit anything out of its pipeline yet. What I'm hearing now is that pipeline doesn't exist anymore, so that there won't be any sort of specific places designated critical habitat areas in North Carolina.

If that is the case, then, yes, we just strike it from this policy statement. Then everything we're concerned about as far as oyster sanctuaries and primary nursery areas in North Carolina, all that stuff is covered under the HAPC use in this policy statement, because the HAPCs include all the state-designated nursery area. That way I think we can kind of basically sew it all up.

MR. PUGLIESE: In reality the bottom line is if you're looking at the HAPC designation of the nursery and all the ones you laid out of the aquatic preserves, outstanding waters; ones that we have included; those are covering them and this is just reiterating what we've already included in that list by restating this. But this is not even in place anymore; the critical habitat areas don't even exist anymore.

MR. WILBER: The strategic habitat areas, the SHAs, I think those also can be stricken from the policy statement.

MS. DEATON: I was going to add about the strategic habitat areas; those haven't gone away; but we've done three or four areas. They aren't any rules; there are no restrictions on them. They are just being identified. I would look at them as preliminary right now; because once it gets done, we're actually going to start doing some groundtruthing and so they may get modified. But regardless, right now they are more of a conservation tool with no regulatory restrictions. You could take it out if you want, but they are in there.

MR. PUGLIESE: It sounds as if where heading is to include – I said take it out, but include state- designated nurseries, and it covers all that; and potentially keep the strategic areas, because it doesn't have to be rule. If those are areas that are going to be of specific value to the species; I think that was the intent of including that in the list. Pace, I think that would be high ground to make sure that those are covered.

MR. WILBER: Yes; I would agree, keeping of SHAs in; and I think now that you've told the story, I think that is what I thought the CHPs were or CHAs were at one point. The key part though is that we need to have a list of what they are. We can't just list categories; we have to actually list places. All we need is the list of what the current SHAs are; and when that list changes, that will be something that gets added to the two new lists for the next iteration of the policy statement. That is all I think we need to do to keep them in.

MR. PUGLIESE: What about including the state-designated nursery areas here also; or no?

MR. WILBER: They're already – they are HAPCs.

MR. PUGLIESE: They are already there so you don't need to do it. Okay.

MR. GEER: Anne, how many strategic habitat areas do you have or do you plan to have soon?

MS. DEATON: Two-thirds or three-fourths of the state coast is done; but in terms of number of units, I have no idea. The biggest complaint we've had is too much area. The concept is they include like a contiguous area where you might have a mixture, a diversity of habitat. Then it has like flow alterations. Some data supports its high quality for fish use. I can get you those numbers of discrete units, and we have maps.

MR. PUGLIESE: I guess to start it, just to get the list of what they are and then we can integrate that information within the appropriate sections of both the EFH document that we've been working on – it is pretty close to finalized but this will add more to it – as well as the subsection of the FEP. Then that detail will be included there, but at least have the list other than just the designation.

MS. DEATON: I can talk to you later; but I'm not quite sure what you mean by a list of what they are. You mean a definition of what they are or coordinates?

MR. GEER: Pace was asking for the actual names and locations.

MS. DEATON: They don't have names.

MR. PUGLIESE: Okay, that is what I was just going to ask. Once you start describing it, it sounds as if like classes based on whatever those parameters you're identifying – yes, no, maybe?

MS. DEATON: Okay, picture a river. You are going up the river, going down the river to the Sound, you know, it is a blob here and a blob there and a blob there; so you have the stepping stones. It is not a class. They may include more than one habitat.

AP MEMBER: It was done using a mapping tool called Marchand. It is like specifically hexagons, and so they are random hexagons, so Anne could probably provide a map with those locations. I don't know if there is a list but a map is available.

MS. DEATON: I can get you a list, because actually in the back they have numbers and we have a short name for each one. If that is what you want, I can get that.

MR. GEER: Pace, will that do?

MR. WILBER: Yes, it will work.

MR. GEER: I was going to say it would be easier just to strike the verbiage out of there, but that's okay. That is what Jocelyn was asking; she was asking all about this. She kind of phrased

it up basically along those lines. We're going to take the critical habitat areas out, leave the strategic habitat areas in there and then we're going to establish by state marine fisheries commissions via FMPs Coastal Habitat Protection plans of other management provisions.

I guess that pretty much covers what her question was; and I guess what we're doing is choosing the last option on there. Does everybody have the comments in front of you? Pretty much she was asking us what we should do with these; the last one, right, pretty much? We've already had that – as she said, it is in our aquaculture policy statement.

She's got the verbiage in there, just take out the critical habitat areas. I think that is pretty much what she has up there already. That was one of the big questions. Is there anything else on that? Where are the comments? There is a series of reference and citations; I counted ten citations in here. If you have any for any of the items in here, I think they are all highlighted, get them to Roger or myself and we'll get those in there. Are there any other comments?

AP MEMBER: In regard to the scope of this document, it seems to be heavily weighted towards oil and gas as the most prominent type of energy exploration and development that is ongoing offshore; but we did talk this morning about hydrokinetic and the wind farms. There may be some things unique. I think Roger brought up the acoustics on the operating wind farm and is there any data on that? Is there any need under the threats to marine resources to expand a little bit more specifically about the future things or do we just want to deal with what we have now?

MR. PUGLIESE: Brian might jump in here. One thing I was going to state is one of the changes from this document compared to the original is some of the statements of threats or connections address all the energy versus just specifically oil and gas. Some of the threats that are identified for those are being blanketed for multiple activities. I think that was a conscious effort of this iteration here; but if there are ones that are still missing, then we do need to include those here. I think Brian might have a statement on this.

MR. HOOKER: I may be jumping into actual specific comments now rather than broad comments, if that's okay. Number 5 I think on Page 8 does – I think it is one of those ones that could be brought into not just be seismic sources. Right now it states the effects of sound on fish behavior and health should be considered in EFH assessments prepared for seismic surveys.

There is no reason that should be limited to seismic surveys. There are lots of activities out there that could produce sounds in the hearing range of fish that could produce impacts to fish. That is one where I think was probably a holdover from the previous policy document that could be updated to be a little more broad.

MR. PUGLIESE: Having some specific wording to just expand it to all energy activities.

MR. HOOKER: Right, I think the effects of sound on fish behavior and how it should be considered in EFH assessments. We probably don't need to have that specific source.

MR. GEIGER: I'm looking at the scope of this document, and again the document for this policy, the types of activities when the scope of this document includes wind, oil, gas, methane hydrate mining, which I see nothing mentioned in this to my knowledge – estuarine and marine hydrokinetics, yes, liquefy natural gas, regasification plant plans and onshore and offshore

facilities and onshore power plants; I thought we had a discussion that onshore power plants are discussed in another document.

I guess I would say is that statement still accurate on the second paragraph, Page 1? I don't think it is. Again I am trying to seek clarification on this; again looking at it from somebody from outside this system; is this document doing what we say it is doing? If it is not, let's clarify it, simplify it and make it so, yes we are talking about these specific issues and not some of these other ones. Again, I may be misreading the document; if I am, please tell me.

MR. GEER: The level of detail for each one of those is dramatically different.

MR. PUGLIESE: I guess again there was that conscious effort to try to combine those. When you're looking at the threats here, talking about turbidity or whatever it is trying to address the scope of whether it occurs under oil and gas, whether it occurs in construction for the base of wind structures; I think that was a conscious effort to try to include all of those.

That is why it does state it across that. That is to some degree why we worked directly with our habitat conservation division partners, because they're the ones that are going to be doing some of the EFH consultation or even elevation as these move forward, because we have some very specific things talking about our HAPCs.

We've designated many protected areas. All of our managed areas now are EFH/HAPC so that consultation activity is more significant. You asked about where some of these are being used. That is where they can actually go in and specifically begin to use the policy statements in the consultation process as we move forward both in the National Marine Fisheries Service as well as any of the state partners.

They are kind of addressing both. If there are specific areas to add and expand, I think some of the lack of other types of information in terms of threats is the lack of information on detail. You're talking about gas hydrates activity. We have almost no information on any activity in the Atlantic under testing.

MR. GEIGER: That is my point; if we have no information – if we have a policy statement that highlights that but we have no information, let's be honest and straightforward saying we have very little information on this, period, end of discussion. Again, when I look at policy statements, I want to see specifically what it is going to address, what recommendations it is going to address, and who it is going to affect.

I don't want to look at a bunch of mission creep either. Are you making a document – what is the specific purpose of the policy? What are you trying to address? It seems again I'm getting the sense there is a wide mixture of stuff we're trying to achieve with this policy and it is a little confusing to me. Maybe a little clarification on some of the upfront language will help me. Right now there seems to be intended and unintended issues that this document is trying to address.

MR. PUGLIESE: I think just real quickly to that; I would go directly what has been projected here in terms of the core policies. When you get into the project should avoid, minimize where

possible offset damage to EFH/HAPCs, very specifically, so it is any of those activities that you identified that are identified in the front.

That is why this talked about exploration, development and transportation, so it is end to end, anything on even placing MET towers and what that impacts in that unit area to the full-blown expansion and operational activity. It is getting to kind of the core of what the intent of at least the council is for many of these types of things; and that is the direction is to reduce or minimize the impact on essential fish habitat, habitat areas of particular concern and supporting activities for managed fisheries.

MR. GEER: Jaime, I see your point; it is heavily laden with oil and gas. I agree with that. There is a lot more history with that, too, agreed. The suggestion would be that maybe making some of these terms – like the very first thing the council finds that oil and gas drilling for exploration; well, some of these things can be changed to like the exploration instead of just for oil and gas. But those kind of things – and you're right I didn't see anything – there is very little in there about the methane hydrate mining at all.

MR. PUGLIESE: That would be one right there that would actually expand the focus to include specifically methane hydrate activity. Again this is kind of crossing between – there is a lot. We started with dealing with oil and gas at a number of different levels to build the core. It stepped further to try to expand those to cover impacts across multiple areas. But you're right, if there are opportunities here that we can take advantage – I think Pat picked up a pretty good one that you could do right off the bat in here.

MR. HOOKER: This document is trying to do a lot, everything from just broad concepts down to at the end some specific recommendations of mitigations. I don't think we could do it today. I can maybe provide some comments, but separate afterwards, bit maybe trying to look at it by impact-producing factors rather than in the broad sense looking at, okay, oil and gas does this, methane hydrate does this.

What activity, what impacts are we concerned about, noise being one, turbidity, direct mortality due to some other things and just trying to scope it out that way and then having some examples of habitat conservation recommendations near the end within the realm of what is foreseeable in the next five years. This is a five-year plan, right; it's reviewed every five years? No, ten? How often is this?

MR. PUGLIESE: The policy statements are standalone. The FEP is something that is updated and addressed on a five-year cycle, but the policy statements can be reviewed and changed any time. It is not tied to a five-year cycle. It is trying to tie it to as most updated policy statement that can be used as long as it needs to be and then updated as needed.

What I did do is I addressed that one specific point that Pat had identified in specifically the energy exploration development; at least in this one case here that expands it. You could also put parens, oil and gas and gas hydrate; but I think keep it more generic since you already have the list.

MR. GEIGER: Then let me just ask a question; again if it is a stupid question, tell me. Is it accurate to say that the South Atlantic Fishery Management Council supports responsible and

sustainable energy development as affects fish and wildlife habitat or fisheries habitat, fish and their associated habitats? Is that an accurate or fair statement to say has the council ever gone on record for that or identified that?

Again I'm just asking; I'm asking the question because I am trying in my mind stepping down the purpose of a policy. All right, you've got all this increased activity going on in the coast. You have previous history in the Gulf of significant energy development and exploration and the effects, both positive and negative that have happened in the Gulf.

You see that expanding to the Atlantic Coast; you see it lesser to the Pacific Coast. With this policy, what are we trying to do? We're trying to protect those fishery and habitat issues from these real and perceived threats. I understand that; but has the council ever gone on record to say we support responsible and sustainable energy development as it may affect fish and their habitats? I am just curious.

MR. PUGLIESE: I don't think there is a formal discussion or consideration like that; because I think the way it has been in the context – and it is evolving, because the council changes over time, too. The representatives change and the way we've addressed this has changed in the past; but the focus on addressing the mandate under Magnuson to protect essential habitat and conservation has not. That I think is why the focus is the way it is and not kind of the other side of things.

Especially with, there is, you know, a lot of political issues at the state levels on where things lie. This has a very crystallized focus on what the intent you are trying to do is conservation of those habitats with the foundation for the fisheries that are mandated for protection; conservation and management.

MS. DEATON: Just going back to Brian's comment; I think on Page 5 is a section; and it starts the threat to marine and estuarine resources from energy exploration and development; that is where it lays out what the potential impacts are from various energy that both Jaime and Brian mentioned. Maybe that needs to be bumped up towards the beginning, because that sets your reason why you need a policy to make sure things are done properly.

MR. GEIGER: Thank you; that was very helpful for me. Again it is like the definition discussion we had this morning. You've got a whole variety of different definitions and it is confusing. I'm looking again to try to be as clear and as clarified as we can on what this is, but also what it is not, so there are no false expectations here. Again, I would rather err on being more conservative with the real data and support than try to do something that is more overreaching and would lead us into maybe some issues that we don't want to get into right now.

MR. PUGLIESE: I'll make a quick statement. Some of the structure is specifically following kind of the structuring that we did in other policies. It is essentially identifying the essential habitats, identifying the threats, and then identifying the policies. That connection has been something that we've been building over time in terms of how these have evolved to the points.

To some degree, that is why you see it the way it is, and it isn't necessarily sticking the threats immediately in the front. It is trying to identify what the scope of the habitats of concern are,

then the threats, then the policies. That is just the nature of that need to shift. That is the latitude of the advisory panel on the recommendations.

MR. GEER: Yes, most of these came from a template and probably we've been building off previous ones. If the AP feels it is more important to shift them around, I don't see that as a problem as long as the content is still there. I think that is six of one and half of another; do you put the section on threats first and then go into the rest of it? The material is still there. I don't think it really matters, but this has just kind of been like a template we followed.

MR. WILBER: I would suggest the direction the AP get back to – I assume you want Jocelyn to make these changes as opposed to Roger making these changes, right? But if the AP is going to make some suggested changes or suggest some changes to make to it; the material that kind of follows the template, as Pat said, that really gets in the way of the message.

The document can be reorganized to cover that repeated material through citations or through appendices to in essence highlight the section that really has the main messages that we want. Now how long it takes to actually do the surgery to the document to accomplish that goal and whether that meets whatever deadline Roger has to get this to the council for its December meeting is something Roger would have to answer. But that would result in a policy statement that is more focused and more to the point than what we have now.

MR. PUGLIESE: Under what we were trying to do was trying to advance this to the council for approval at the December council meeting. There was some timeline reality on what we were doing to get this moving forward, because there are a lot of activities that are ongoing and we've had enough requests to say when is the new policy going to be available so that we can be able to use that or whatever.

I think that is somewhat of the tradeoff. The bottom line is that whatever we can get done to refine that and revise that here would expedite the ability for the council to approve it within the next couple weeks is what I think what I'm saying. I think it is still – the next couple weeks; it is shorter than that literally; so essentially it will be what we can refine here.

If it takes something as simple as reorganizing it now and bringing the threats to the front versus that, as a simple thing that can be done – if there is going to be a rewrite, then that is going to be a whole different process that potentially could bring this back to the AP in April or something if we have to run it back through the AP for a final vote. Then it is going to be June before the council would even consider a new policy statement.

MS. DEATON: I'll say I didn't mean for you to have to – my suggestion to reorganize, I don't think you have to. It could be as simple as adding a sentence saying there are real potentials of threats, refer to Page 5, and not mess your template up.

MR. GEER: I personally hate dealing with deadlines where it basically says you have to have this done by this day; because if it is not ready, you don't want to take it to the next level. That happens way too often, I think. If we feel it needs work, it needs work and we do it and it is delayed in going in front of the council; but that is a decision we have to make in this room.

MR. GEIGER: With all due respect to the drafting team, there is a lot of hard work in here. We have a saying or at least I have an old saying I used to use is the juice worth the squeeze? I think right now given the process that we are in this particular draft; the juice may not necessarily be worth the squeeze. Again for me coming in personally late in this process; I don't think it is fair to turn this process on its side.

I think there is enough good stuff in here as it is now with some I think clarification up front, I think will be more than sufficient. I apologize for any inferences I may have caused. That is not my intention to turn this thing upside down, but I am trying to understand it from a third party perspective and making sure that it is a worthwhile document that is going to achieve its stated objectives and be valuable and obviously the stated objectives.

MR. PUGLIESE: I think your comments are absolutely appreciated. This has been an evolving process for a long time and I am not trying to downplay any of those. I think the importance is that as these get done, it doesn't mean that we can't revise that the next time we have a sit-down addendum or anything to a policy. You can balance out exactly where we need to go. It sounds as if we're very close, and I think a lot of work got it from where it was to where it is now, which I think really did get it to be more concise and more useable.

MR. GEER: Roger, what do you need to have the final document ready to distribute to the council meeting in December? The council meeting is December 6, right?

MR. PUGLIESE: Eighth. The committee is meeting December 8th. Essentially this would be bundled into the advisory panel report. Any other recommendations; this would be added as we did with the other policy statements that were approved in the past that this panel has brought forward. We would add that to the report out and it would be brought forward to the council for consideration.

MR. GEER: Does it go in the council packet in advance?

MR. PUGLIESE: Well, the council packet is going this week; so this will be distributed. The bottom line is whatever I can get done in advance – the sooner we can get the report out from this group; that is when it will go to the council.

MS. WENDT: I just had a question about the title. It seems like the word "considerations" was inserted, right? It was previously Policy for the Protection and Mitigation and now it is Policy Considerations for the Protection and Mitigation. I wonder was that intentional so that this isn't really a policy statement; it is just things you are supposed to consider in developing a policy? If this is a template that is supposed to be used for the other policy statements, is that word going to be inserted in all the other?

MR. GEER: I know the council has had – the few meetings I've had to go to the council and talk about these policy statements, they've had more angst over titles than they do about the content. That makes a very good point. I don't know; Pace, do you know what Jocelyn was thinking on that; what was the reason?

MR. WILBER: I guess if you ask most people what is a policy statement and do any of these documents resemble what that expectation is; I think the answer would be no. I think her

insertion of the word "consideration" was sort of in recognition of the fact that none of these things that we call policy statements look like policy statements we get from other organizations. There are issues that need to be kind of considered.

They're source documents for information that you can use when you consider things that are on your desk; but none of these documents are really set up as a choice. Sort of like when the council comes to a fork in the road or the EFH process comes to a fork in the road, it can go one way or the other; that there is an actual recommendation of which of those two you are choosing. It is just sort of a list and it is not really presented as a policy or a set of recommendation, per se. I think that is ultimately what you meant.

MR. PUGLIESE: I understand that; however, in our response on seismic, we site the doggone information on EFH and provided the policy statement as part of that and identified all the habitats that had been identified as potentially threatened. While that is a consideration, the council does consider these EFH policy statements and they are tied again to our essential fish habitat mandates.

I understand what you're saying in terms of the conciseness of that, but there is some intent of again meeting that mandate on using this to the maximum extent practicable. The statement that the title was very specific originally, you're right; there was a statement. If that is still appropriate; that is one way of looking at it that may be more to see if they bring it back to what the original statement was.

MR. WEBB: Well, as the latest entrant to this discussion, I am going to ask the dumbest question. What authority does the South Atlantic Council have in regards to energy development? I mean, could they provide a document that says that the turbidity is going to ruin this EFH so you can't put that windmill in there? What exactly is the fundamental purpose and authority of a policy statement like this?

MR. PUGLIESE: Well, the council's authority is specific to fisheries but they do have the directed mandates for essential habitat. The National Marine Fisheries Service, as part of their directive, implements these designations. As we identify areas as essential habitat or areas of particular concern specifically; that has the ability to bring them into extended EFH consultation. The idea is that these be in the review of virtually all permitting activities that have habitat.

Those are integrated and sited in those with the idea that is what they are supposed to try to address to minimize or in some cases recommendations have come from the council in opposing activities, et cetera. The reality is the council does not have the regulatory authority to stop things. However, the information is being put into the appropriate process where that decision is being made through the ongoing process.

MR. WEBB: If this policy is sent forward by the AP, the council itself is going to have to review it and decide whether they are going to accept it or not without change.

MR. PUGLIESE: In reality, the council absolutely defers to the Advisory Panel. They will adjust where needed or even have some input from Headquarters or different components as needed; but really rely on this group as being the individuals in the field that see what the best avenue and policy direction the council can do to really address the mandates for conservation of

essential fish habitat. I'll say beyond any other council in the country, too. That is reality I think.

MR. HOOKER: Are we ready to go into maybe some – just start going down? Okay, I would just recommend on Page 2, the South Atlantic Fishery Management Council finds – I would just change that to energy exploration or development; once again just kind of broaden that out. I don't know; you don't need to single out oil and gas. Yes, energy exploration.

Then Page 6, the alteration of long-term shoreline migration patterns with complex indeterminable ecological consequences; I'm not sure what that even means especially if it is indeterminable. I don't know how you're going to figure out why you have done it if by definition it is not determinable. I don't know what the recommendation is there. Is it facilities that alter – is that what it is trying to get at, facilities or construction activities that may alter?

MR. PUGLIESE: We were just checking the original version to see what its origin is. I think it is tied to structural.

MR. HOOKER: Is this something consistent with you have a shoreline-hardening policy documented?

MR. PUGLIESE: A beach renourishment shoreline; yes, that is actually addressed in there specifically. I'm not sure if it connects back into this.

MR. HOOKER: Anyway, maybe just change it just a little bit there and I would strike indeterminable. Okay, next I have Page 7 – actually I'll save that one for later on. It is regarding offsetting impacts; but we get to that a little bit further on. Sand-sharing systems all facilities; I guess on Page 7, just below it, Number 3; I think it just needs a little clarification; all facilities associated with energy exploration and development are designed to avoid impacts on coastal ecosystems. I mean anything you do is potentially impacting a coastal ecosystem; so it is so broad that – yes, exactly.

MR. PUGLIESE: Truthfully in here I think this kind of ties to the – because I think what the other one was getting to is any establishment of structural materials that would change the natural movement of sand along the coast areas, so it was getting to that kind of a natural system. If you placed enough there; that it affected the actual migration patterns of sand sources and bar formations and different things like that.

MR. HOOKER: I think if you capture what you just said a little bit better so that it is a little more clear. I think what you said just now I think could help it a lot. On Number 6, just below it on the same page, pilot scale projects could not occur in areas where full-scale efforts are predicted to be environmentally unviable.

This one; I think the purpose of pilot projects a lot of times, are to actually show what ecological consequences may be. I think you would be limiting yourselves. You actually almost want to put a pilot project in an area where you know there could be an impact so you can observe what that impact is; and rather than just never knowing what the answer is and trying to place it far away from anything else. A pilot project by definition is one that you're trying to test out and find out what the impacts are, whether it be technological, biological or what have you.

They are not long-term sustainable projects. They are pilot projects and they are small scale in nature and can be more easily adapted to try out different techniques for minimizing impact. I think by saying they should not occur where commercial or full-scale projects are occurred, I think may be unnecessarily limiting yourselves to actually finding out more on the science side of things.

MR. WILBER: We actually in our experience find the opposite. Most pilot studies are done to test the technology. While there might be some investigation of the environmental impacts, it is my opinion more lip service than anything else. The choice of where to test the technology is usually based upon some cost of getting there, getting the boats out there, doing all the monitoring and stuff that is needed.

Unfortunately, that puts you in close proximity to a lot of sensitive nearshore resources or places where threatened or endangered species migrate or move through the area. In our view it has been pretty consistent, especially in hydrokinetics. It has been the view of our agency to not allow pilot testing in areas where a full-scale operational facility would present a lot of environmental hurdles.

MR. HOOKER: I would state I think what you're trying to say is that when pilot scale projects occur, they are not doing enough monitoring of biological assessments. That to me should be what you're trying to get at here is that pilot scale projects should have very robust biological monitoring or other aspects to them rather than just technology.

MR. WILBER: But industry often characterizes the environment as this checkerboard of places where they know information and lots of places where they don't have enough information to know whether their proposed technology is going to work. Once they have invested the resources to demonstrate the technology will work within a certain part of the ocean, they are very reluctant to go to another part of the ocean that they don't have similar environmental information about in order to actually scale up the next level.

The agencies that are fostering that particular technology have supported the industry in that case each and every time. If you have a real concern that a particular type of energy development activity shouldn't occur in close proximity to hard bottom or corals, everyone should know that up front and you shouldn't take any steps towards actually full-scale development of that activity in close proximity to hard-bottom or corals. That is the intent of that.

MR. HOOKER: I understand; I'm just throwing this out for the panel's consideration. Regarding hard-bottoms and corals, I mean unless you put something near hard bottom and coral, you don't really know how that could impact hard bottom and coral. One thing I know we struggle with sometimes is, okay, you have a large sand resource and you are now putting a bunch of hard structure in sand a resource and avoiding all the hard bottom. Does that make sense?

Now you're changing everything to hard bottom versus now you've lost all the sand. By saying off the top that you shouldn't put things in any type of even a pilot project in an area where you may not place a commercial project; I think you are unnecessarily binding yourself to evaluate these things. But, again, just for the panel to consider. Well, no, I'm not saying he should. I'm

saying that you shouldn't be limiting yourself. You should be able to evaluate the project and if it is appropriate then put it in an area where you are looking for impact.

MR. WILBER: I think what I would do is I would take the word "not" out just like you said and also take "un" out from before viable. Then it turns into pilot scale projects should occur in areas where full-scale efforts are predicted to be environmentally viable.

MR. GEIGER: I would take "predicted" out and say "demonstrated to be environmentally viable". I hate weasel words; it is or it isn't. If you have effort or you have data to show that full-scale efforts are environmentally unviable, fine, so be it. All right, take out "predicted"; say "demonstrably environmentally unviable". I know where Brian is coming from and I think you are unnecessarily restricting it, but I also hear your arguments very succinctly as well; but predicted, no; demonstrated environmentally unviable.

AP MEMBER: Pace, were you saying viable or unviable?

MR. GEIGER: Demonstrably unviable. I mean, however you want to phrase it; it is or it isn't. How you address the words is up to –

MS. DEATON: I was just going to say some impacts don't have to be demonstrated; they are already known. We know what some impacts will do to hard bottom, so we don't have to put a structure on hard bottom when we know that it is going to have a negative impact. I think that is all this is saying is, well, you know there is a high likelihood of a problem, why would you test your product in that environment and waste time when it probably wouldn't be permitable in the long run?

It is to save the person time rather than testing an unsuitable site from the beginning. Because then once you allow that in, let's say you do your pilot and you do it in a sensitive area and then that company uses the results to say, look, it is economically viable, it worked; but they didn't consider the habitat impact that occurred. Then it is misleading for the larger project in the end.

MR. HOOKER: Once again you used the word demonstrated, and I think that is fine. I am agreeing with Jaime that if it you demonstrated that particular thing that you're doing and that particular type of habitat is something that will never work; then that is fine. I think I am in agreement with that edit; that it is a demonstrated –

MR. PUGLIESE: What I've done is captured the discussion so it reads pilot- scale projects should occur in areas where full-scale efforts are demonstrated to be environmentally viable. Is that acceptable? Just to add, I think it also is getting to like we wouldn't want to see any type of pilots placed right in the middle of a marine protected area or spawning habitat, things that we have designated very specifically.

Some of those EFH/HAPCs where you know you are not going to have build-up in some of those very specific areas; and I think that was to some degree beyond just the individual habitat types, but some of those very specific designated areas that are pretty critical.

MR. HOOKER: Actually, I don't know if I agree with that. I thought we were going to say pilot-scale projects should not occur in areas where full-scale efforts are demonstrated to be environmentally unviable.

MR. GEER: Do you want to split the positive or the negative?

AP MEMBER: I was wondering if you should add the word "only"; "Pilot-scale projects should only occur in areas where full-scale efforts are known to be environmentally viable".

MR. HOOKER: Well, to me, when I'm reading that; I think you're requiring information. I don't want to beat a dead horse, I'll stop; but I do have a couple others. Moving on to Number 6 real quick or 7 – no, I'm sorry, Page 8, and Number 5. We've already changed that one, Number 6 directly below it; this is more of an FYI.

On November 3rd President Obama issued a memorandum to all the departments regarding compensatory mitigation; so there is a large departmental effort underway at several agencies to look at compensatory mitigation. I know DOI is definitely involved in that; and anyway I stress it is something evolving and maybe we can look at that memorandum from November 3rd and see how this policy statement matches up or doesn't match up with that November 3rd memo.

It is fairly broad; it just directs – I think it is directed at all public lands and submerged lands, although the study seemed to be primarily more focused on like BLM lands where you are giving up part of a tortoise habitat or something, desert tortoise habitat for a solar project and then you're doing some compensatory mitigation like mitigation banking.

He is trying to really get at trying to have more widespread policies on how to do that because the objective is to have no net loss of areas or no net negative, not loss per acre but a no net negative on impact side. It is going to be a hard translation into submerged lands; where I think on surface lands we have public and private partnerships, it is more straightforward.

It is a little unclear to me, but I think just recognize that is something that is occurring right now. I think translating that into submerged lands I think is something that we're going to be challenged with. Then I think my last one is on Page 10. Number 17 – again some of these just restate actually existing regulations. You say in the last sentence there, a vessel monitoring system with global positioning system will be employed to continuously monitor all vessel movements and locations in real time. I think we've come a long way.

AIS are now required by the Coast Guard on all vessels 65 feet and greater. Now whether you're trying to say that vessels even less than 65 feet all need to have AIS, it is unclear to me what you're saying. The AIS issue I think is well stated or already in the regulations for all vessels 65 feet and greater.

If you're trying to get at small vessel movements, then maybe you should just emphasize that. But otherwise AIS is required already unless you're under tow; so some large towing vessels, 26 feet and larger, I think have to have AIS, but that is like a small exception but generally it is 65 feet.

MR. PUGLIESE: I guess what it comes to is the way this is stated it is talking about all work vessels associated with any kind of construction, so would essentially all vessels be covered?

MR. HOOKER: That is why I'm asking you to clarify. I would look at that and is it saying even if it is a small workboat; they have to have AIS or do you have a policy statement somewhere that says all fishing vessels have to have AIS? The policy should line up with some things that you do on the management side. You have a far greater traffic for fishery vessels than there are some of these work vessels. Is it possible to get a word copy of this, Roger, if we had additional things to add?

AP MEMBER: All the other policies are stated as policies. I agree they are more considerations than they are actual policy statements, but if you want to be consistent.

AP MEMBER: How are you defining policy?

MR. PUGLIESE: This entire document is what would constitute the council's essential fish habitat policy relative to any energy activities.

AP MEMBER: What is it; I mean, it has no legal authority, correct?

MR. PUGLIESE: Well, but that is not what this is intended to do, because we don't have the regulatory authority to address these. However, we are reaching out and meeting the mandates under Magnuson to address the essential fish habitat mandates.

MR. GEER: You can have it if you want it; you opened this can of worms.

MR. GEIGER: No. Again, my sense is I have a much clearer understanding now of what the intention of the document is. Again, from my perspective policies are important especially if they are being used by an agency or an entity to make a management decision or to justify a management decision. My sense is this is used by various entities to make and justify a decision. As such, that policy should be as tight and concise and as clear as we can make it.

MR. GEER: That is a good last statement for this topic and I appreciate that. All right, we're running almost 30 minutes behind before we get into our state breakout sections. How about let's have South Carolina and North Carolina go to training first; and that is with Tina. We'll have them go with Tina and do the online tools access and training.

Then Georgia and Florida members will stay here and break into your state groups and discuss the priorities on fishing and non-fishing activities. We did that last time, but just to finalize them; prioritize climate variability and talk about opportunities and advancement of citizen science. I would like to end at 4:30, so it would mean 45 minutes in each session.

(Whereupon, the meeting recessed on November 17, 2015, to reconvene November 18, 2015)

The Habitat Protection and Ecosystem-Based Management Advisory Panel of the South Atlantic Fishery Management Council reconvened in the Florida Fish and Wildlife research Institute, St. Petersburg, Florida, Wednesday morning, November 18, 2015, and was called to order at 9:00 o'clock a.m. by Chairman Patrick Geer.

MR. GEER: All right, we were going to start this morning with a very brief discussion finishing up our Energy Policy Statement from yesterday. I hope all of you had a chance to look it over. If you haven't provided Roger comments – I think he's gotten a couple of them – we could discuss that now. How did you want to approach this? Did you want to just go through?

MR. PUGLIESE: What, I'm going to do is we'll start at the beginning and we'll literally go through – what I can do is I had integrated a couple that were provided last night. Then I got two more this morning, so I've got those in the background, so what we can do is – I think both Anne and Brian provided some this morning. I'll have those so we can go to those points when we get there, but I'll just walk through the document and we'll adjust as needed, addressing the issues where we started yesterday or anything else that anybody wants to do.

MR. PUGLIESE: The last energy policy had it listed plural; but if it is appropriate, we could just have it as policy for the protection, because this is an EFH policy. That would be it. Okay, let's move on. Anything within the front body, just the opening statements, I don't think we had anything outstanding from yesterday.

MS. DEATON: Well, do you want me to tell you the comments I made as they come across, because I had one thing up there?

MR. PUGLIESE: That is what I was trying to – because what I've done is I've got – you did have something in here; yes, you did. Okay.

MS. DEATON: That was just to address the concern that was raised –

MR. PUGLIESE: To have that direct link back to the threats.

MS. DEATON: Yes.

MR. PUGLIESE: That makes sense.

MS. DEATON: These are just suggestions; you don't have to do them.

MR. PUGLIESE: I'll integrate that in there and then we can identify that section when we get to it and make sure we fill it in. I'm going to do the on-the-fly changes as we go.

MS. DEATON: Then the next paragraph down I had something about – I just don't know about methane hydrate mining. Is that being discussed for this area in the South Atlantic? I thought that was in cold water.

MR. PUGLIESE: No, it actually has been discussed because we do have the area to the north in the diaper; and then from what I understand, there may be methane hydrates on the Blake Plateau Area, and that is one of the reasons that they were looking very closely at the Blake Plateau. This is something that they had not moved on, but there is a lot of interest.

I know the Gulf of Mexico; one of the reasons the Eagle Ray was developed is to put methane sniffers on it to look in the Gulf of Mexico. That is still an advancing technology that is something in the background that needs to be on the radar. The first areas are just Anne had

recommended cleaning up to have the policy finding that and then exclude all those "that" throughout the listing here. The additional one is to add in the title Oyster Reefs at the end of the list, so I'm going to do that.

MR. HOOKER: I mean it says and other; it's fine.

MR. GEER: Those are probably the three biggies and I didn't know if we wanted to put that in.

MR. HOOKER: No, you can add it; I don't object to that in any way. It is just whether or not it is calling out a few of them and then saying and other energy exploration and development, but whatever.

MR. PUGLIESE: I mean that gets to the idea of do you want to keep it – you either have the examples or you keep it general; but you are calling out wind because it is active. That is one of the reasons, because it is something that is moving forward at this time.

MR. GEER: You could list them all or you just don't put any.

MR. PUGLIESE: It is oil, gas, wind and other or did you just want –

MR. GEER: Yes, oil, gas, wind and other exploration.

MR. PUGLIESE: You've got a comment here on the marine and estuarine waters.

MS. DEATON: That is just everywhere, but at the top it says certain habitats are particularly important and then it goes down and has, you know, coral and wetlands, I get that; but then all marine and estuarine waters is –

MR. PUGLIESE: Well, that actually is one of – we had the designations I think.

MS. DEATON: EFH.

MR. PUGLIESE: We have the water column habitats, marine and estuarine water column habitats; and that is I think why it was included in that suite, because then it covers the entire water column areas of both estuaries and offshore.

MS. DEATON: Okay, then that is just not – like above it just sounds like it is a subset, certain areas that are particularly important. I thought it was getting at some HAPCs or is that more EFH?

MR. PUGLIESE: It is actually a combination of both, because you also even have diadromous and fish-spawning habitats included in here.

MS. DEATON: It is fine how it is; it just kind of seemed –

MR. PUGLIESE: I think the idea again it was tied to some of those designations and tied to the fact that if you don't identify that whole water column component where you're talking about

changes in – some of the discussions we had the other day, the changes in currents or potential dispersal of chemicals or different things like that would be in the water column itself.

MR. HOOKER: I guess I do see Anne's point there. In F you have the hydrologically and ecologically connected to waters that support EFH. I think B is maybe trying to get at water quality and maybe into chemistry toxicology type things. Maybe if it was more specific to that; but otherwise why have A, B, C, D, and E? Why don't you just say all marine and estuarine waters and life therein?

MR. PUGLIESE: But again one of the things is that it is tied to that specific water column component that has been designated as essential fish habitat. I think that is the difference. It is not just saying everything when it says estuarine habitat. What it means is the water column. Maybe that is what – marine and estuarine water columns.

MS. DEATON: Yes, Roger, I would suggest just changing it to water column, water column habitat.

MR. PUGLIESE: Yes, because then it gets away from the idea of being just the estuary. What it really is specifically talking about is the water component. So you're right; to some degree it is talking about quality, flow, different things that are trying to get captured in, but it is a little more convoluted relative to coral or whatever. Is there a recommendation, Anne, to put in shallow habitat such as oyster reefs and submerged aquatic vegetation?

MS. DEATON: Yes, I was just thinking if this is about the on-site facility. We've had this discussion to approach large vessels; there is probably going to be dredging involved so they would be at risk. Okay, you can ignore this one, but it just struck me – it is just a suggestion that why not organize that table by the activities so that you would have LNG first and then it would say what habitats that would possibly affect.

Then you would have wind and say what habitats. I thought it might make the table shorter and it would tell you – like if you were doing a review and you were worried about a certain project, it would tell you at a glance. This is more focused; this is organized by the habitat type, which that is fine so just leave that.

MR. GEER: That can go either way.

MR. PUGLIESE: What we can do is leave this like this. I will talk with Anne afterwards; and if that is something that makes sense to do in the final revision of this, we can potentially do that if that seems reasonable. Yes, we to remove those so that was taken care of. Your recommendation was to remove the, what, Number 8, because it is already included.

MS. DEATON: I think it is in the table.

MR. PUGLIESE: Yes, right there, Coral HAPCs, the specific ones. We have the table. The habitat is potentially affected. That is basically just a follow-up. Brian, jump in if I miss where you had – I am trying to track between all three. Under development, you just are going to look into providing the citations for Number 1.

MS. DEATON: Yes.

MR. PUGLIESE: I think we got rid of that wording. We definitely removed the indeterminable.

MR. WILBER: Roger, on Number 5, does it work editorially just to take out the parentheses after you make those changes, just make it a sentence?

MR. PUGLIESE: Yes, it does.

MR. HOOKER: Did you see my edit on Number 5?

MR. PUGLIESE: That's what I was going up to.

MR. GEER: That's Anne's, I think.

MR. PUGLIESE: All we did here was just removed the parentheses, so we had already dropped the off and indeterminable yesterday.

MR. HOOKER: No, I had added due to the placement of facilities offshore at the end of that sentence.

MR. PUGLIESE: I'm looking at Anne's; that's why. Here we go; that just followed right here.

MS. DEATON: That would address mine, because my question was just which energies would do that; which energy process would do that?

MR. PUGLIESE: I think it is more the structure, hard structure; that clarifies that whole discussion.

MR. HOOKER: It could be anything.

MR. PUGLIESE: But structure oriented.

MR. HOOKER: Yes; and I think that is what I was just trying to help clarify.

AP MEMBER: Why are we going to limit it to just offshore? I mean, does that offshore include nearshore, nearshore environments?

MR. PUGLIESE: I think that is intended. If you want to be more specific – yes, I see where you're going, because the intent is really supposed to be the entire sand flow and everything. Of course, the nearshore is going to be –

AP MEMBER: Yes, I just wanted to clarify.

AP MEMBER: Do we define offshore and nearshore in the document, because those terms are used differently depending on who is using them.

MR. PUGLIESE: Right; you're correct.

AP MEMBER: It might be worthwhile if you say offshore just in parentheses, to put in distance or range.

MR. HOOKER: Based on this, I think nearshore and offshore – if you want to put nearshore and offshore facilities.

MR. PUGLIESE: Did you want to just include both or just –

AP MEMBER: I think it would address concerns that offshore wouldn't address nearshore. If you had nearshore and offshore, you would cover basically from mean low water to edge of the EEZ.

MR. PUGLIESE: Yes; we basically have to do those parentheses.

MR. HOOKER: I had a comment on Number 11.

MR. PUGLIESE: Yes; that is why I stopped and I was going back to there.

MR. HOOKER: On this one I'm just broadening it out so it is not directed at one single anthropogenic sound source. Then the second half sounded to me to be more editorializing the comment and not necessarily adding anything to that. It seemed a little overly – it just touches upon everything from whether or not fish move to whether or not if they don't move. It seems to get into a lot more than is necessary for this document.

MR. PUGLIESE: Yes; and I think it was brought in because there was significant discussion in response to some of the G and G representatives making comments to the council that the fish won't move. With the significant population we have of reef fish; that could really be problematic. I'm sure that is why this was probably added in to some degree, because of that concern very specific to the snapper grouper species in many cases; and then the reef species that obviously won't move, the ones that are in the system.

MR. HOOKER: I see your point, but it seems to be drawing if they don't move, therefore they will be impacted negatively. It starts to get into I think more than just they won't move or they will move. Just recently NOS did those with the Langseth doing those seismic surveys off of North Carolina. I think you guys may be familiar with that; and they videoed the Langseth doing the seismic surveys over hard bottom off of North Carolina. They are writing up a paper on it right now, looking at what the fish behavior was during that seismic survey. It wasn't ours, it wasn't BOEMs. It was a National Science Foundation Survey.

MR. PUGLIESE: That is definitely the type of information that we're looking at. I think I had put a note if I'm not mistaken actually in one of the responses I had back from Jocelyn, some of the comments that came from South Carolina in discussion directly from the MARMAP program, a discussion on at least the concern over the species, over snapper grouper and the issue of snapper grouper. But it is the opinion of what you all want to do; if you want to keep it more general so it covers all different types of impact; that seems to be kind of the direction we've been going.

MR. PUGLIESE: Right; and the bottom line is that we'll do this; and then if that say that MARMAP reference or something is very specific, the council has the ability to integrate it back in or it may get raised by the members as it gets into there. Okay, let me take care of 11 right now. This is one of the ones that actually after that discussion had been provided the reference. Are you familiar with this reference?

MR. HOOKER: Yes, Doug Nowacek.

MR. PUGLIESE: Nowacek, Schwartz; because that had been provided as potentially a citation for that and it may be just for the general statement.

MR. HOOKER: Again, I am just not quite sure what you're trying to get at here. There is insufficient available information to conclude that fish will swim away from the noise. I mean, I am not disputing that fish won't swim away from the noise; but I am trying to understand what that – we already have we have to use the best available science and that some fish may not swim away. I think it is trying to address maybe an old assumption and then trying to bring in some effects analysis into that.

AP MEMBER: Doug Nowacek typically does marine mammal research, doesn't he? I don't think that is a fish reference or a citation. I agree; I would take everything out after that first sentence.

MR. WILBER: I agree; I would make it more general because you are almost can interpret that statement to say if the fish leave their habitat area, that is okay. That is a reasonable conclusion and I'm not sure we want to take that position.

AP MEMBER: I think part of what they were getting at is a lot of agencies will say in their EIS or whatever, well, fish will leave the area and so it is no big deal; but they don't have any data to support that conclusion. I don't think we need to put it to that level in here.

AP MEMBER: I think a general statement is better.

MS. DEATON: I hate to go back to that, but this is a list of potential impacts, right? This is the potential. Now that sentence reads affects of fish behavior and health from sound is not well understood. That doesn't say there is anything at all.

MR. HOOKER: I have an additional edit that would fix it.

AP MEMBER: There was that other sentence in the other one that needs to be in there. I think that needs to be added and then leave it at that.

MR. HOOKER: You could still leave the Nowacek citation in there for that statement.

AP MEMBER: Well, that is only dealing with marine mammals, though.

MR. HOOKER: I think he brings in like a literature synthesis part to that paper.

AP MEMBER: I would have to go back and look. I think a better reference might be the Popper –

MR. HOOKER: Yes, anything by Hawkins and Popper, we'll support that.

AP MEMBER: Right and I can send them to you. I want to go back and look at that Nowacek one just to make sure he actually talks about fish in it, because I would hate to put something in there that is not relevant.

MR. HOOKER: I think you forgot the "from" in your version.

MS. WENDT: Roger, I have a comment on Number 12. It starts out with Dolan provides – it seems like it should – to be consistent with the others it should start with –

MS. DEATON: I had revised that, Priscilla, but then 13 has the same type of information, so I was thinking – look at 13.

MS. WENDT: Maybe they need to be combined somehow; operation of power plants can alter water quality, result in thermal pollution, something like that. It just seems inappropriate also to start that bullet with a citation as opposed to affects of or operation of. It seems like you could eliminate 12 and just keep 13 and add the citations from 12 to 13.

MR. PUGLIESE: What I've done is I've brought those up so if we want to delete basically everything after, just take a look to see, because what I've done is I've brought up the revised 13, which is the section below; added the front section; so what of the remainder of 12 is needed?

MS. WENDT: I would eliminate that sentence Dolan provides a review of the ecological repercussions that can result.

MR. PUGLIESE: One sentence with all those references.

AP MEMBER: Take 12 out, just keep 13, and modify 13. That is the easiest.

MR. PUGLIESE: We've got them combined here so this essentially does that by doing this. Do we want to delete this entire –

MS. DEATON: Yes, and it seems like a lot of references and maybe a lot of references are needed; it depends on what they say.

MR. PUGLIESE: Basically it will say operation of power plants can alter water quality and removes the greatest risk to aquatic and beyond. Then that additional wording changes in what was originally 13, with water quality and impingement and entrainment. This entire thing goes away; that addressed 12 and 13.

MR. HOOKER: I just had a change adding above-listed impact-producing factors in that one; just a simple edit.

MR. PUGLIESE: The first one I think is your comment on 3.

MR. HOOKER: Right, up above and down below I do have the reference to the presidential memo on November 3rd, but I don't think we need to get into that right now. He does set forth policy for the federal government regarding mitigation in that memo, which I pasted it to everyone else's e-mail if you want to read it.

I wouldn't suggest trying to spend too much time on that one right now. Number 3; maybe that is just wordsmithing. It seems hard that you can actually avoid any impact to an ecosystem and still – I don't know; it is one of those kinds of broad statements.

MR. PUGLIESE: I think there is some history in this group of trying to be sometimes more, I guess, on the protection side. And then as minimization or the discussions of mitigation, as those unfold, those become the next steps, and that is just some history. That is your call what you want to do.

MR. HOOKER: Again, yes, I was just trying to help it be more realistic. If no one agrees, it is not that big of a deal.

AP MEMBER: My read on the Executive Order, quickly reading through it; one of the very first things, before it gets into the compensation that offsets the impacts, is that you do avoid places that are irreplaceable. So maybe avoid and minimize or however you want to put it; but avoid is a pretty important word in there, I think.

MR. HOOKER: I agree avoid can be an important word, but it also depends on what you put after it. If you say avoid impacting of ecosystem –

AP MEMBER: I see what you're saying, too.

MR. WILBER: I haven't looked at the Presidential Memo, but like the Clean Water Act and other environmental legislation, it is always avoid and minimize impacts to the maximum extent practicable. There is always recognition that there is a public interest balancing test here. That would be the language that would acknowledge at least that public interest balancing test.

But at the same point, all the agencies doing power plants are going to be required to do that anyway, whether it is in this policy statement or not. Is this just acknowledging the regulatory context within which power plants are discussed or is it trying to point towards a decision? I think it is just acknowledging the context.

MR. PUGLIESE: That is terminology we've used in the past, too. The key, though, to keep avoid in there you are trying to do at the first level.

MS. DEATON: It just looked like there was a word missing; projects comply – we're trying to say projects should comply or shall?

MR. PUGLIESE: That wasn't in there, projects comply.

MS. DEATON: I have like most of the rest of my comments are just adding the word should or whatever word you want.

MR. PUGLIESE: I mean, you're talking about existing standards so it is almost a "should" thing in that case. Okay, I think we resolved that; didn't we? Pilot-scale projects should only occur in areas where full-scale efforts are demonstrated to be environmentally viable.

MR. HOOKER: Again, I think everybody seemed to be disagreeing with me, but I wanted to just make sure everyone was clear what it is saying now. What it is saying now is that pilot-scale projects should only occur where full-scale efforts have been demonstrated to be environmentally viable. To me it is saying, well, you already have a full-scale project done and demonstrated that it is not environmentally harmful and then now you can put a pilot project there.

It seems to be backwards; and I just want to make sure that is what people intended. My take from the discussion yesterday was that what we're trying to say is that if there are demonstrated negative impacts to an area; then, yes, you shouldn't put a pilot project there that will have those same impacts. I think that is what we were trying to say; why put a pilot project in an area that has demonstrated that type of project will negatively impact whatever resource you're trying to protect? That is what I was totally on board with.

MR. PUGLIESE: Well, I think flipping it to where it originally started; I think there was also the discussion that what it was really intended to say if you had a location like a spawning location that you knew you would not allow that to expand or have any intent whatsoever to allow an expansion to a full-blown operation; then those types of areas be excluded. I think that is what this was trying to capture at least in the intent.

If I'm not mistaken, I think that was at least in areas in the core of the Oculina Bank area that we put all these different regulations in these new spawning locations, which are critical to long-term activities. If we know that those are not going to be – the terminology is environmentally unviable or they are in areas that are going to compromise the transport of larvae in an area, constriction area on an estuarine system or something; I think that is what this was attempting to capture. Maybe it is not stated as well.

AP MEMBER: I was going to say I think you guys are saying the exact same thing but that sentence is awkward. It is basically saying don't put a pilot-scale project somewhere where there is not chance you're going to have a full-scale project.

MR. HOOKER: I'm not saying that. I'm saying don't put a pilot-scale project somewhere where the impacts from that pilot-scale project have demonstrated negative affects to a resource you're trying to conserve. What I am saying is that in some situations – and this is where I originally got into this one – is that in some situations you may want to put a pilot project somewhere, so you can learn from how that pilot project interacts with different resources in the environment.

AP MEMBER: Even if you know that you wouldn't be able to ever put a full-scale project there because it is on the Oculina Banks or it is in a spawning aggregation?

MR. HOOKER: Yes.

AP MEMBER: Then I guess we don't agree with you.

MR. HOOKER: Without knowing that you're impacting those resources in any way whatsoever; that is my argument. If you don't know that you're having any kind of effect to the resource you're trying to conserve; then why –

AP MEMBER: But I guess they don't need to put a big turbine or an oil and gas platform on the Oculina Banks to know that putting a big piece of concrete or a big pipeline through the Oculina Banks is going to affect that specific area that you're removing.

MR. HOOKER: I think that would be a demonstrated negative impact.

AP MEMBER: No, because we haven't done it yet.

MR. HOOKER: We've dredged through coral banks before.

AP MEMBER: Right so I am saying don't put a pilot project there.

AP MEMBER: I guess there are two different types of pilot projects, the way I see it. One would be a pilot project looking to see – like a MET tower or does this technology work in this general vicinity or does that technology work producing power purposes of pilot and research versus a research project to see how that sort of technology may affect those whatever resources.

I think probably in my mind the one that would be important not to put in important resource areas would be the type to figure out can we profitably make power in a profitable way this way. Now if you do have some sort of research where you want to figure out whether that technology is impacting those resources; that is a different type of pilot project.

That would maybe be okay, because where else would you put one for like that. But in my mind, usually when I see pilot projects; it is more of is this technology feasible producing power versus the other. You want to put it where it is not going to cost as much to build it, where you can easily access it to get out there and maintain it, whatever. Lots of times that is when it becomes a conflict.

MR. HOOKER: I agree with that assessment. From my perspective, when you say pilot project, there is the technology testing aspect to it, but there is also the environmental monitoring aspect to it. I don't know what this could do. Pilot project is the right type of project that you want to look at and demonstrate what the impacts could be.

It seems like there are differing opinions on this. I would almost prefer that the original language, just leave it as the original language, reject all changes and leave it as the original language rather than how it was changed and we can move on.

MR. GEER: I asked Roger just putting it in as areas is very vague, maybe defining some of those areas that may be a major concern. Like the Oculina Banks; that may not be an area they ever want to go in. Nobody is going to ever want to approve something going in that area. If we have certain areas that we want to protect, give examples of those areas is what I was suggesting there; and that is what he put in.

MR. PUGLIESE: That's what I added. One question; I'm wondering if we could add to the end of this and it may get to this is that we're specifically talking about pilot projects here; would there be an ability to put something about research conducted to quantify those would be an accepted – you know what I'm saying.

It would take it a step further, so it is not very specific like an operational pilot project to enhance, but then it gets to at least doing some research to understand, define the current flows the physical and natural characteristics of those systems to better understand those.

MR. WILBER: I'm reluctant to go down that road, because that is going to depend upon what the actual objectives of the specific research projects are. I mean, on one side if the objective of the research is as Brian has kind of alluded at times is to examine the effect of the project on the environmental resources; well, then the environmental resources need to be present in order to actually conduct the research.

Now our problem is that – and problem here in quotes – is in our experience over the last few years dealing with BOEM and FERC and other groups that often take this pilot study approach, it has largely resulted in a long series of negative outcomes where we didn't get what we wanted and the agency with the decision-making authority overruled our environmental concerns and went ahead and did something.

I think everyone's kind of back is up against the wall here because we feel a need to draw the line based upon that experience and not really get too wrapped around the exceptions that might be prudent to actually locate the pilot with the resources being present. I like the way that the language got changed; but at the same time recognize that this is the council's recommendation for the positions that other agencies with decision-making authority should take. It doesn't really result in a prohibition or anything like that. All those practicability tests are encoded in law not in documents like this; still basically drive the train.

AP MEMBER: I think it also fits into this EO, because it mentions that we should identify places that we don't think that they should be placed. Natural resource values are irreplaceable.

MR. HOOKER: I'm fine with the rejected changes and leaving it as is.

MR. GEIGER: It raises another interesting quote of the process. I don't think we've defined anywhere what a pilot project is and now we bring in the aspects of research. Do we cover research activities as well as this? Should they be also included in these kind of activities or at least identify those research activities that may not necessarily be appropriate to be performed, based upon whatever the stated objectives are? We are probably silent related to research activities in this policy statement. Should we at least identify that needs to be identified or considered?

MR. WILBER: The regulatory programs at BOEM and FERC all define what pilot studies are for the purpose of their stuff. I don't think we need to have our own definition of what a pilot is. I think we can live with what they call a pilot study. Now, I know FERC has research projects, but I don't know if there are like research licenses from BOEM or not.

MR. HOOKER: We do have one instance of a research activity plan. It is under our other kind other catch-all part of our regulations so that the VOWTAP Project for the two turbines off Virginia is considered a research plan; but it is also a pilot project. The Department of Energy is paying for it as a pilot project.

MR. GEIGER: If there is a standardized definition in legislation that identifies what a pilot project, at least cite whatever it is with a reference. But again I'm coming back to if there are different definitions of what a research activity is, I think that it would at least be appropriate to cite research activities as part and parcel of this policy and put some statement to that affect like we did for pilot projects. You don't want to preclude doing necessary research, but at the same time you want to at least identify the potential of some research activities may have on fisheries resources and habitat.

MR. HOOKER: I agree, Jaime. One case was just this past summer with the National Science Foundation's seismic surveys using the same exact equipment that an oil and gas private entity would use; but since it was National Science Foundation and USGS, it just went on without any – well, there were some outcries.

MR. GEER: All right, we need to move on. I know this is stimulating. Everybody loves delving through these policy statements. What I am going to suggest. Brian and Anne, are any of the other comments that you put in here; do you feel that we need to discuss them or that they could just be added?

MR. PUGLIESE: I tell you what I can do; let me just run through their individual ones and we'll make the comments if there are issues. If not, we can integrate those and I can just do it after the fact.

MR. HOOKER: I can talk about the ones I did so you don't have to flip back and forth on some of these, like the small ones. Right after that, I just said instead of field studies by BOEM, I would say the action agency there. FERC is the lead on some marine hydrokinetic projects and so it doesn't necessarily have to be – and you have Army Corps of Engineers. I would just think it would be appropriate through field studies by the action agency or cooperating agency or other agencies rather than necessarily calling out BOEM.

MR. PUGLIESE: Review administrative policies and best management practices and probably need to spell it out up in the front here, though. Again, if you think we should separate it; that is fine, but I think that is what the intent with the numbering was. This looks like pretty much editorial; does anybody have any issues with this? I think we cleaned it up, required monitoring before, during and after project.

It seems pretty straightforward. Then under licenses should again require the vessels and then the last one is licenses and permits should require. Were there any other ones that you – because what I'll do is integrate everything that we've seen in those last ones that Anne has provided the edits there? This one you said we didn't necessarily have to address, Brian, the one where you cited the President's Policy at this time. This one can stay as is and then we can address that.

MR. HOOKER: What I'm saying is we don't have to address it right now but we should maybe reference or have whoever is compiling the final one make sure they read the memo just to see where it is consistent and where it may be inconsistent; that's all.

MR. PUGLIESE: Okay; and those are the comments you made about action agencies.

MR. HOOKER: Yes, and then this one, Number 9 is just trying to make it a little more general, although it does get into seemingly just oil and gas related activities. But when I started editing it, I was just making it more broad; just Outer Continental Shelf. But then I added oil and gas lease/sale.

Anyway, it doesn't change the meaning of the sentence at all. I think makes it a little clearer; that's all. The last comment, though, the community services, I just wasn't sure what that was trying to get at, an analysis of community services, what the EFH impact or fishing impact we were looking at there.

MR. PUGLIESE: I guess it is probably more of a social reference, the impacts of fishing communities; for community operations. I think that is probably what its origin is – maybe that would be better to say that; but I think it was actually maybe broader than that. It is tied to the coastal community or fishing community; it is social community services. I think that is basically a characteristic of the communities that are involved in the location where this facility is being looked at.

MR. HOOKER: As long as there seemed to be some understanding of what that meant; that's fine, you can reject it. Number 10 here, just again clarification; it started to say permit decisions should be based on geotechnical studies. Well, if you're doing a marine hydrokinetic project, you don't need to know about the geotechnical survey, so I was trying to clarify that it is construction projects that penetrate the seabed. Those are the ones you need to look at geotechnical.

Again just clarification; bonds, we have a bonding program. I don't think we have anything called an environmental bond. Projects are bonded in four of those exact activities so I was just clarifying that bonds must be required and adequate to assure that resources will be available for unanticipated environmental impacts, et cetera; just again some clarification to make it a little clearer and accurate.

MR. WILBER: Can we back up to 10, unfortunately. The intent of the original language was to deal with anchors, which depending on your interpretation may or may not penetrate the seabed.

MR. HOOKER: I guess why would you need a geotechnical study?

MR. WILBER: Well, you want to make sure that there is a sufficient sediment lens under any buried hard bottom for the anchors to actually hold the hydrokinetic device in place so that winds and currents don't drag it into hard bottom that might be nearby. As you well know, this is a long conversation between our two agencies.

MR. PUGLIESE: How about this right here so it covers both, penetrate or attach site includes the anchoring.

MR. HOOKER: Okay.

MR. HOOKER: At Number 13, I did supply what I would hope to be clarifying language regarding that; and in general it seems to be an ESA concern and an EFH policy statement; but I did supply what I thought would be more clarifying language for it. I guess there is an overall question of whether or not you want to keep an ESA statement in there.

MR. PUGLIESE: We actually do include those in our deliberations, because we have – while we're not responsible, we have to react to needs for ESA issues. We just came off of some work with black sea bass relative to the right whale closure areas. ESA is integrated into discussions, so we could look at that vision or view of the entire ecosystem impacts relative to these or habitats that are connected.

MR. HOOKER: What I did here was just try to then – with that statement that it is your intention to have ESA statements in here; then what I tried to do is clarify that exploration and development activities that could disrupt or impede no migratory patterns of endangered and threatened species should not be authorized during said migratory patterns; breeding, nesting seasons of those endangered species.

I think previously before I just said you shouldn't do anything during migratory seasons, and it just seemed overly broad. Again, the U.S. Coast Guard, we had this discussion yesterday so I just helped clarify that pursuant to U.S. Coast Guard AIS requirements. In 18 we're dealing with some deepwater coral stuff and deeper stuff that divers can't access, so I just eliminated diver. If you want to implement other ways to verify that, that is fine. Diver and ROV that would be fine, too. It just seemed limited just to say only diver surveys when you're dealing with really deep depth.

MR. PUGLIESE: Yes; and I think there was interest to make sure that you had the diver in the shallow water. I understand it would –

MR. HOOKER: Again, exclusion zone, I was thinking probably the term there would be set back versus exclusion zone; but again that may be just semantics depending on how you view it.

MR. GEER: Would you rather have buffers?

MR. HOOKER: Buffer would work as well, yes.

MR. PUGLIESE: This is important to include here, because we've been having some comments specifically about potential buffers around spawning locations. I think that gets directly in line with some comments we've been receiving from other areas.

MR. GEER: If there are any new references, get them to Roger.

MR. PUGLIESE: He's already sent them.

MR. GEER: You already sent them; okay, if there is any other ones, please get them to him. Thank you for that lengthy discussion on this. I am glad it's over.

MR. WILBER: Pat, can we just have a recap of what is going to happen to this document in the next couple of weeks and who will be doing it?

MR. GEER: Do you want to take the lead on this now or Jocelyn; what do you want?

MR. PUGLIESE: Basically I'm going to take what we've done. I mean, we've been hands-on editing the details. The next step was to take what we have, the base that I had originally worked on that we edited all the way through yesterday, added in the different components that everybody agreed on, combine some of those editorial materials provided by both Anne and Brian.

That will be the final version that would be – and then have any additional citations that are either provided or we get after to fill in any of the final ones, and that would be essentially the version that I would be looking at combining to provide back to as part – build it into the report out of the AP to the council. This has to be done shortly, and I think we're pretty close to getting most everything done with all the edits and everything that has been recommended. That's the plan.

MR. WILBER: What are we going to ask the council to do at the December meeting?

MR. PUGLIESE: The council will be asked to approve it as the new policy statement for energy. It is already actually in the committee agenda for the Habitat Protection and Ecosystem-Based Management Committee.

MR. WILBER: For those of us who have to brief council members prior to their attendance at the council meeting, when will the version that you're asking the council to actually approve be available for briefing up the chain?

MR. PUGLIESE: As soon as we can get that done. Our original briefing package is going out this week. It may go out into the second briefing book, which I have to look at. I mean, it is short, because the committee meeting is Tuesday, December 8th. Between now and through Thanksgiving, it has got to be done. I think it is going to actually have to go out before, because the council meeting is shortly after that.

MR. WILBER: Our briefings up the chain are usually done the Thursday and Friday of the week before the council meeting?

MR. PUGLIESE: Yes, so it will be done before the briefing, I'm pretty sure; because I think it is going to happen on the third. I think I just got a notification that it may be on December 3 rd is the NMFS briefing and council committee members. We have a committee member briefing and then we have the briefing with you, the National Marine Fisheries Service, Region, and Center and everything. It is right in advance of the council.

MR. GEER: When can you get a final copy of this with those edits?

MR. PUGLIESE: With these edits? Well, I'll try to get this thing turned around and completed and sent out before I leave. I've got a follow-up meeting this week, so hopefully I can get this

out before the holidays; and then any final edits need to be provided the end of the following week.

MR. GEER: The 27th of November?

MR. PUGLIESE: Yes.

MR. GEER: That's a Friday.

MR. PUGLIESE: That Friday, the 27th of November.

MR. GEER: All right, so Roger is going to go ahead and clean this up, send it out to us and you want final comments by the 27th, any additional comments or any references or comments or anything else by November 27th.

MR. PUGLIESE: If that time slips a day or two, I will let you all know exactly what the time is; because I need to double check when we have that second briefing book. Because of the holidays in there, I am not sure if we are trying to get it out even before that; but that is the plan.

MR. GEER: From the research needs, I told Marcel he has to be stimulating and enthralling and keep us all engaged. He has video so it is going to be a lot better than a policy statement.

DR. REICHERT: Thank you for allowing me to give you an update on in particular the regional fishery-independent monitoring efforts. Upon request, I changed the title a little bit. Part of what I will be doing is addressing some of the statements in the FEP Chapter 5. I will refer to that on a number of occasions.

Several of you may remember the update I gave a while back on the fishery-independent monitoring efforts. I'll go through the basic information relatively quickly; and then I will highlight the changes since the last Chapter 5 was written or since my last update. I will start with the SEAMAP South Atlantic Program that started off as a coastal trawl survey in 1986.

In 2009 additional funding became available and SEAMAP South Atlantic supported an expansion of the reef fish survey and habitat characterization. It also supported partially a red drum survey that is currently called the Red Drum and Coastal Shark Survey, because a number of coastal sharks are collected in that longline survey and the data is being used for stock assessments.

Also the SEAMAP program provided some funding for the Pamlico Sound Survey, for the Southeast Regional Taxonomic Center that mostly supported dive studies for the trawl survey and the reef fish survey. An important component – and I'll talk a little bit more about that later – is the funding for the data management.

As I said, a trawl survey, this map shows the yellow bars are the sampling strata for the coastal trawl survey. It is a shallow water trawl survey. It is the only long-term trawl survey in the South Atlantic region. It has three sampling seasons; spring, summer and fall. Historically 112 stations were sampled each sampling season; but due to funding, we had to reduce that to 102 stations a couple of years back.

Some of the species that are targeted are shrimp, blue crab, but also several flatfish species, king and Spanish mackerel, spot, croaker, and menhaden. A lot of the information that came out of the trawl survey has actually been used recently in stock assessments, in particular the bluefish, menhaden, king mackerel.

In particular in king mackerel, the data from the trawl survey are used to compile a juvenile index; and that information was used by the council to look at potential recruitment issues in setting regulations about a year and a half back. The reef fish monitoring is a little older. MARMAP, the Marine Resources Monitoring Assessment and Prediction Program, has been in place since 1972. We have been sampling reef fish since 1978.

We've consistently used a chevron trap – that I will talk a little bit more about in a little bit – since 1989. As I mentioned, SEAMAP provided some additional funding in 2009; and a significant change came in 2010 when the Southeast Fisheries Science Center provided funding for the Southeast Fishery-Independent Survey.

That allowed us to more than double the number of stations we can sample each year. It also introduced a video survey on the trap; and I'll talk a little bit more in detail about that later. MARMAP used still cameras for a while, but the introduction of the video cameras made huge progress in the type of data that we are collecting. Also, it included a component, a bottom mapping component.

SEAMAP and SEFIS introduction to the reef fish survey is something that happened since the last iteration of the FEP. The main survey goals are to monitor stocks, both seasonally and annually, and provide life history information, but also an important component is to provide habitat information and also to maintain and manage datasets and also to manage sample collections.

Recently we started using DNA that was taken from otoliths that we had stored since the beginning of the survey for DNA studies. The fact that we had held on to those samples now provides a unique opportunity to do some historic DNA analysis and also to provide analysis for stock assessment and management.

On the lower right-hand side is a list of the usual type of information that we collect, including species' composition and relative abundance, but also a number of life history parameters including diet; and that is something that we have started doing since SEAMAP started providing some additional funding. That is mostly in support of ecosystem-based fisheries management activities.

That addresses some of the topics that were listed in Chapter 5. We have been very active with the scientists from the Southeast Fisheries Science Center and also here at the Florida Research Institute in setting up workshops to come up with standard procedures to age fish, to do calibration studies; and those have been an important component in the data workshops for the SEDAR stock assessments.

In Chapter 5 it lists that we should develop standard procedures for aging fish and calibration of otoliths and spines; and I would say that is accomplished. Labs are collaborating, exchanging sets of otoliths and spines; and we discuss regularly in workshops the best practices for

processing and examining otoliths and spines for age determination. Then the habitat characterization, an important component as I mentioned, and the photos and the videos gave us a unique opportunity to collect very detailed habitat information.

That is now routinely examined when the videos are examined. I'll talk a little bit more about it later. The Southeast Fisheries Science Center has made a significant effort in some bottom mapping in the region. Then also the trap and the video information allows us to compile habitat-associated species compositions; and also since we do that on an annual basis, it provides us an opportunity to look at potential changes in the habitats, in particular in the live bottom habitat.

Then the reef fish survey deploys about 250 CTD casts annually; and then in addition the trawl survey deploys about 100 CTD casts every season. We total over 500 CTD casts in the region, and that gives an opportunity for monitoring water column characterization, in particular temperature, salinity and some other water column parameters.

Then we have some additional activities. The SEAMAP funding provided us an opportunity to start a gag ingress study and that helped us link the estuarine environment with the offshore environment. Unfortunately, due to funding restrictions, we halted that study this year actually. This year was our last sampling season.

We also collaborate with fishermen, both recreational and the commercial sector, to collect additional fishery-dependent data, especially for additional life history parameters in the seasons that we don't collect samples in. Then we upon request provide samples and data to third parties; universities, states and federal agencies.

We also provide a research platform and training opportunities for students, for teachers and for others. We are out there with the three research vessels for the reef fish survey all summer long, and that provides a potential for a deployment of research equipment at a relatively marginal cost, because we are out there already; as long as it doesn't interfere with our regular monitoring efforts.

These are some of the examples of the species that we collect a significant amount of information for. I'll briefly go through the gears that we are using. We are using what we call a short bottom longline. We used it since the late seventies. Due to funding, we halted that survey in 2012; but fortunately we got some of the lost funding back and we started that back up in 2014 and continue that this year.

We use that gear in areas of high relief; live bottom habitat of high relief. It is a relatively short bottom lined with 20 baited hooks. The soak time of all our gear is 90 minutes. We have about 1,000 stations. Depending on the year in particular on the funding, we sample about 50 to 150 samples. This gear mostly targets snowy grouper, the jacks, some tilefish, speckled hind; in general, snapper grouper species in the deeper waters.

We deploy generally over about 90 meters of depth. We are currently trying to see if we can attach a video camera to the lines. Unfortunately, the light conditions are so low that it is very difficult to get any footage; but we are looking at the potential for some lights or for some cameras that are a little more light-sensitive.

Then we have the long bottom longline. We used that since the early eighties. Again because of funding, it was halted in 2012 but resumed in 2015, this year. It is a one-mile cable with 100 baited hooks, and we deploy that in particular over the soft muddy bottom habitat, the golden tilefish habitat in the region, generally around to 200 meters of depth.

These are specifically targeting the golden tilefish, blackbelly rose fish and other species associated with some of the softer bottom habitats. In addition to that, I already mentioned that we take CTD data at every sampling site and we also use hook-and-line rod-and-reel collections to collect additional life history information, in particular diet studies and some reproductive parameters.

We are currently considering using that to develop a standardized index. The problem with rod and reel is that the expertise, the experience of the angler plays a really important role. If I stand onboard with the captain of our research vessel, I know he is always going to catch more fish than I do although we are using the exact same gear. We're trying to develop a standardized deployment; and the Florida Fish and Wildlife Institute has developed some methods that we could potentially use.

Then the chevron trap, which is actually the most important gear that we are using, consistently used since the late eighties; it is deployed over the back of the boat in depths to about 120 meters. Soak time is, as with the other gears, 90 minutes. Here you see the trap going through the water column on the lower right-hand side.

It is a little light; but the moment that trap hit the bottom, you can actually see fish coming around. Here you can also see the camera on top of the trap. We currently have three cameras. Here is a GoPro, a Canon that we have currently replaced with a GoPro, and then also in some traps we have a camera inside the trap that looks inside the trap, looking at fish in the traps.

Currently, depending on the depth, we have one to four videos on the trap. Here you can see a moray eel coming, a couple of groupers and black sea bass. We don't attach the – this is called the long camera – above the trap to all the cameras, but this provides us an opportunity to look at behavior around the trap and essentially do some length measurements of the fish, because currently we don't have stereo or lasers on the trap.

Currently, the method we are using, we cannot measure fish with the cameras. The cameras allow us to study fish behavior not only around the trap but also inside the trap. This is a video of a gag grouper coming into a trap. I can't crank up the video sound, but it is going after a tomtate and you can see the tail of the tomtate in the mouth of the gag grouper.

You can actually hear the tomtate grunt in the mouth of the gag grouper. What we originally started to realize that we may be actually – and this is all using standard GoPros – that we may be collecting information on sounds that fish make in the environment. We haven't explored it yet, but a lot of fish make specific sounds during the spawning season or during territorial behavior.

We haven't explored it yet, but we feel that perhaps we have an opportunity here to even glean even more information on the videos. We use that to study fish behavior around the trap, inside the trap. He is eating or she is eating the tomtates; so when you count tomtates, we know we're

missing two. We can visually characterize habitat. We can link that to some mapping sidescan sonar information. This is an area with a red snapper.

This is very important; we are using this information to create additional indices of relative abundance, because there are a number of species, in particular hogfish, lionfish that we catch rarely if ever in the traps; but we see them on a regular basis on the videos. We're using the combination of the trap and the video survey to provide an index of relative abundance.

This year or is it next year – anyway, we've replaced the Canon and the metal housing with standard GoPros in deepwater housing. They are a lot cheaper than the Canons and the resolution is fantastic. Each video is – yes?

MR. HOOKER: On the noise right now, are you cataloguing those? What is your status; you're just acknowledging that you may in the future do some work with it but not now?

DR. REICHERT: Exactly, because one of the things we want to see is the – I'm not familiar with the terminology; but if the range of the sound that we are recording is in the range that can provide useful information for fish behavior, for instance. You can hear the grunting of the grunt in the gag's mouth in this little video. You hear that background noise all the time.

MR. HOOKER: That's my point is that I know there has been a lot of research trying to establish libraries, and we've had recommendations from Popper and others to really improve those sound libraries so you know what you're hearing. The problem is that it is really hard to match the sound to the actual fish. But, yes, in this situation you have a captive group where it is perhaps a little easier to do. That is interesting.

DR. REICHERT: That is what we started thinking about, because you hear something and you have an opportunity to see the fish. In this case it was very clear where that noise came from.

MR. GEER: Just a real quick general question I don't know the answer to. Do fish make different sounds when they're stressed versus when they're spawning?

DR. RIECHERT: I would guess that they do. Again, I'm not an expert, but I bet you they do. I think they make different sounds when they spawn and when there is a panic reaction; because in general terms I would say that may be kind of a warning for other fish in the area.

MR. PUGLIESE: Just a quick point to the idea of a library; one of the things that if you are exposed to the materials we had online, one of the systems that online ecospecies system; one of the discussions in the next generation of revision is to actually add that as one of the components of that sound reduction.

DR. REICHERT: The sound doesn't work. If you are interested, you can see me later and I'll make you listen to this. In that Chapter 5, we described the Palmetto, which is mostly used for our reef fish survey, and the Lady Lisa, which is mostly used for the trawl survey and our long bottom longline survey.

In recent years SEFIS, the Southeast Fisheries Science Center uses the RV Savannah out of Skidaway and also NOAA Vessel Pisces. They both are used and Andy Foster, I believe.

Currently we are using three research vessels; and that was what I was mentioning earlier in terms of we had these three research vessels in the summer sampling. Our sampling season is generally from mid-April through mid-October.

Our regular sampling season where most of the activity occurs is May through the end of September. The Palmetto actually this winter is getting two new engines and new generators. The vessel was built in '82 with about a 20 years life span, and the vessel crew has done an outstanding job maintaining the vessel. Now with South Carolina investing in two new engines, we hope or expect this vessel will be operational for at least another 10 or 15 years.

That is something that was in the chapter and we talked about in the past is the aging fleet of some of these research platforms. MARMAP, just to give you an impression of the changes with the SEAMAP and SEFIS coming on board, prior to 2008 we collected, depending on funding, about 600 collections annually.

Now for the chevron traps we are over 1,500 collections annually; and that means both videos and trap catches. Our sampling design, we have 3,500 known sampling stations. The map on the right-hand side shows our coverage; and as you can see the red are the chevron traps, the blue are the short bottom longlines; and as you can see we have a pretty good regional coverage.

Again, that provides an opportunity to follow habitat where we deploy traps on an annual basis. As I said, we sample about 1,500 currently. Sample processing and data analysis, CPUE and CTD data; this is combined effort with the Science Center. We at South Carolina DNR, MARMAP and SEAMAP are mostly responsible for the life history studies; the reproduction, DNA, diet, age and growth.

The video analysis is mostly done in the Science Center, although we assist the Science Center with examining about 500 to 1,000 videos each year. I'll talk a little bit more about the database. We have one combined comprehensive database; and that is currently available in the SEAMAP database that is searchable online.

I don't want you to go through this, but this is a list of the species that we catch and there is a list in Chapter 5. I think there is one change I would recommend in terms of primary and secondary species, but our species list hasn't changed a whole lot except for red snapper, which is a usually important species in the Southeast Region.

In the last two or three years it has persistently become within our top ten most abundant species in our surveys. But other than black sea bass, tomtate, red porgy, white grunt, vermilion snapper and gray triggerfish, they have consistently been our most abundant species in the survey.

AP MEMBER: You mentioned earlier that there were certain species you didn't get in the traps that you instead quantified from the videos. Do these tables include both of those or are these strictly trap?

DR. REICHERT: Excellent question. This is only the traps. Otherwise, I'm not sure they would get into this list of most abundant species, but we see great white sharks, tiger sharks on a regular basis in our video. Obviously we don't catch them in the traps. As I mentioned, hogfish we never catch in a trap, lionfish and there are a couple of other species that for one reason or

another are not attracted to the traps; but those are not included, although I think lionfish is actually on the bottom there somewhere, No, that is the life history study.

MR. HOOKER: Again, all these survey stations, is that available like an ESRI product, a map service, if we wanted to actually overlay where your survey stations were?

DR. REICHERT: Yes, and it is actually in the system that Tina demonstrated yesterday. It is in that index system there.

MR. PUGLIESE: It is the SA fisheries, because it is connected directly and producing and, generating products from the overall SEAMAP/SEFIS and MARMAP systems. Yes, we built that entire system so that there could be that; and that is going to get expanded and refined and maybe even has more capability as we move potentially to get ArcGIS online so then those can be consumed.

DR. REICHERT: There is actually species' information in that same system is available. One of the big dilemmas that we had is that on one hand we want to make sure that the information is available; but on the other hand we want to protect the resource. Initially we were providing that information in great detail.

We decided to truncate our lat/longs because we don't want the people to go exactly to those locations, because there is spawning information, there is size information, there is species' composition information there. On one hand you want to protect the resources, but we also want to protect the integrity of the survey; the tension between making that information available and at the same time protecting the resources and the survey.

With SEFIS coming online, we had an opportunity to increase the bottom-mapping efforts in the region. SEFIS did some multibeam mapping in particular to fill the gaps in the fishery-independent sampling universe and to increase the coverage of trap/video survey. It was to find out where is live bottom habitat and can we start sampling there?

Currently, as you saw in the previous map, we have a pretty good coverage of the entire region. Now the bottom-mapping surveys are mostly focused on filling the gaps in the general bottom-mapping information. Nancy Foster and Pisces were used for that. Currently the Science Center is doing about 12 to 32 days a year.

Because we have the video, at night the bottom-mapping activity is taking place and then during the day we actually deploy traps, so we have a verification of the bottom that was mapped during the night.

AP MEMBER: When you say the habitat is groundtruthing and video; are you talking about the traps themselves?

DR. REICHERT: Yes.

AP MEMBER: When they collect the multibeam data; that just gives you the bathymetry. Are they also analyzing the backscatter data from that?

DR. REICHERT: I am not an expert on that, but I believe they do. They have a variety of gear that they are using on the Pisces. I'm not entirely sure about the technical details.

MR. PUGLIESE: Some of that definitely is being analyzed to begin to develop habitat distributions in some of the mapping areas. We've been trying to – as part of the multibeam characterization have been trying to add in both the base map product as well as if there are ultimately those types of habitat characteristics maps developed based on the backscatter.

MR. HOOKER: My understanding is that all NOAA vessels are now collecting the backscatter; but whether or not they're processing it, I think that is another issue.

AP MEMBER: Right, I know it takes a lot of effort to process the backscatter, but also unless you – I mean if you change the settings regularly during the multibeam to really tie down the multibeam collection and you don't record what those setting changes were; it totally screws up your backscatter and you can't get any information from it. I was curious if they are truly using the backscatter data and trying to analyze it properly or if they were just kind of collecting it. That is something I can talk to somebody at NOAA about.

DR. REICHERT: Yes, Todd Kellison's group is spearheading that and they are doing the analyses. Since this was not just recoding profile but investigating hard-bottom habitat, I believe that they are analyzing that type of information.

DR. SEDBERRY: The Pisces is also equipped with the Fisheries Acoustic System, too; so at the same time that they're getting the bathymetry and the backscatter, they are getting the biomass acoustically in the same locations at the same time. Now what they're doing with all that data I don't know, but they collect it as they are running all the time.

AP MEMBER: I mean that was my curiosity; if they're just collecting it but not actually watching it while it's coming in, I don't know if anybody is making the necessary adjustments.

DR. REICHERT: During the night they are watching what is happening, because that is what they're doing at night. They are mowing the grass to collect data about habitat. That would be a question for Todd Kellison and his group.

AP MEMBER: Is Andy David involved in that, too?

DR. SEDBERRY: Andy is doing the ROV and trap survey in the MPAs, and they use the Pisces for that as well, so he is very familiar with all the systems onboard and what he is using it for.

DR. REICHERT: This is some of the information that I showed earlier. You see the ramping up of the trap survey and the video survey; and as I mentioned, over 1,500 traps currently. Then I mentioned earlier the data management. We now have a searchable, relational database in place; it is an oracle data base housed and managed by South Carolina DNR.

We have a Regional SEAMAP Database Working Group that oversees the activities and it is currently linkable to other applications and databases. As I mentioned earlier, we provided the data to Tina and you may have seen some of that yesterday. It is publicly available and searchable. You have to register and then you can query the data.

Currently the SEAMAP Coastal Survey data is in there, the Southeast Reef Fish Survey data is there; although there is a delay in the reef fish survey and that is because of some quality QA/QC procedures that we go through because we have two programs. The other thing is in some instances the data is an index of relative abundance. The parameters are slightly different depending on the stock assessment.

If you use a nominal CPUE, that may be different from what you will see in a standard CPUE in a stock assessment; so we want to make sure that if there are stock assessments ongoing that we let those stock assessment assessments complete before we provided information to avoid confusion; but hopefully in the next couple of years we can update it.

I think currently there is a three-year delay. We hope to have only a one-year delay so we are hopefully relatively up to date on that also. Then the red drum and coastal shark survey is there, Pamlico Sound survey data is in there, and recently we added three near sites ichthyoplankton surveys to the database.

Currently we are developing the inclusion of the CTD casts in this database. I believe we only have the surface temperature and salinity in the bottom temperature and salinity in there. To put an entire cast in there really inflates the number of data points that are available, so we're looking at the best way to do that. Hopefully, in the future we'll include some of the habitat information in there also, but we are currently working on that. That may require some time and some funding to program those searches.

MR. PUGLIESE: Connected directly to the data system, as you mentioned earlier, the SA Fishery, the intent is to build not only kind of base information on some of the distributional information, but then build products; and that is something that we've been evolving for each one of the different components of the survey.

Then if you do want to look at species distribution or core spawning location distributions, different things like that are in process and to be developed. Again, hopefully, as we get into higher-end ESRI capabilities; that some of those are going to be easier, easier to tie into or link to or provide from that.

MR. WILBER: The database, does it include the estuarine surveys that South Carolina DNR does?

DR. REICHERT: No, it does not, except for the red drum and coastal shark surveys. It includes Pamlico Sound, but it is not the inshore estuarine database yet. We haven't thought about that.

MR. WILBER: Okay, and just to complete, so there is no other way to get access to the inshore estuarine data from South Carolina DNR at this point other than to go to somebody's office and ask for it?

DR. REICHERT: I believe so.

AP MEMBER: Knowing that most of those ships have hull-mounted ADCPs, so current data, is that true or is it something that is not always available?

DR. REICHERT: Currently that is not available. The Savannah has an ADCP, so they may have some data available; and we are developing a current direction and velocity unit for the traps. We may have that information available in the future; but that currently is not available. It is not routinely available.

That is one of the things that we are looking at in terms of how can we – and I think the next slide is the needs – how can we enhance the current surveys by adding equipment or survey gear – because again we already have the platforms out there – that we can do at a relatively cost-effective way, but to collect information that may be generally useful?

Again this addresses some of the issues in Chapter 5. I think continuously the need for more bottom mapping comes up, because we do not have full coverage of the region just yet. The reef fish survey and the coastal trawl survey in terms of federal waters, I believe are one of the few ongoing annual surveys conducted in this region. There is a NMFS shark survey that does some shark monitoring.

But in terms of plankton, to potentially develop recruitment index indices or a pelagic fish survey, in particular targeting the mackerel, wahoo, mahi mahi, is not present in this region. Funding has severely restricted the dive studies we can do, although they are very important for ecosystem-based fisheries management.

I think one of the needs is to resume or expand the diet studies. Then also continue development of analytical methodology and in particular ecosystem-based modeling in support of assessments and management. Then as I mentioned earlier, the utilization of autonomous tools as a quick development of autonomous torpedoes that can measure a variety of parameters, including video that you can deploy.

You can do your routine sampling and then you retrieve that equipment later that day; and that is or would be a very time-and-effort efficient way of collecting additional information. Then as I said, there are probably technologies that we could add to our survey or other surveys that could provide some additional information needed for management and assessment. That is a brief overview of where we are and what we've done since the last update I provided you. If you have any comments or questions, just let me know.

MR. PUGLIESE: Thanks, Marcel, very timely to get that discussion and open this entire discussion on especially the revision of Volume 5. What I wanted to do first is I was going to touch on a component of the discussion for research and information needs; very specifically to managed areas.

What I wanted to do was to walk through what some of the more recent activities to try to advance some of these discussions are. In order to enhance the monitoring of the managed areas, the council had put in originally deepwater snapper grouper marine protected areas and now it is proposing spawning special management zones.

As part of the discussion and support for this, the research and coordination and collaboration in the past has really led to the process that developed both the original eight MPAs as well as advancing into the future on newer methodologies for spawning areas. The research really was the foundation from which to connect that and to inform the next generation of processes for

either characterizing the existing areas or into the newest areas proposed under Amendment 36 as spawning Special Management Zones.

In order to accomplish that, one of the things that the council has addressed is the idea of creating system management plans for specifically the marine protected areas. Then as we move forward with the spawning Special Management Zones, also creating the same type of an operational functional system to be able to monitor and characterize and provide the information to quantify the functionality of these different systems. The most significant benefits to the end phase, enhance the fisheries to recovery of the populations as a result of protection of the adults and spawning aggregations or spawning location sites and then the spillovers.

A number of variety approaches are really incorporated to look at both inside and outside of those marine protected areas. In this iteration that is moving forward on resource monitoring as part of the system management plan, I think there are 12 actions or areas that are being identified as areas to invest in and to advance; determining pre-closure distribution and abundance of the dominant harvest species in the MPAs, maintain the annual monitoring programs that collect the information both inside and outside the marine protected areas to really provide the distribution abundant size-age structure and sex ratios of the specific dominant species within the MPAs.

Also to identify fish population demographic size, age structure, sex-ratios within and outside; locate the spawning areas – this is identified as aggregation, but in our reefs really mostly it is going to be locations of key spawning areas for deepwater species of grouper species.

To track movement of the adult fish, to develop and apply a couple biological and physical models, to locate potential nursery sites, to characterize deepwater snapper grouper species within the MPAs as compared to reference sites; to look at and characterize the fish communities inside and outside the areas as well as the habitat utilization patterns, the trophic dynamics, ontogenetic changes and prey/predator relationships.

The areas that are specific to monitoring habitat have to do with completing multibeam surveys of all the marine protected areas, completing all the areas within those, as well as completing areas outside so that you have a footprint that goes beyond the original MPA area. Those areas are still under discussion of how extensive they are. Groundtruth the bathymetric data for habitat classification and create general habitat classification are some of the discussions we were beginning to talk about earlier.

That really is kind of in a very simplified version of what is being integrated into system management plans now for marine protected areas; and a very similar one is going to be crafted for spawning Special Management Zones. The idea is to establish these focus areas and then really look at what is going on under those existing areas and then fund different – either work with partners or try to get resources to fund those efforts into the future.

DR. REICHERT: If you allow me real quick two remarks relative to the first page that you just showed – George, correct me if I'm wrong – one of the things the SSC mentioned was there is the spawning aggregations in there, and I think the SSC said that spawning activity is probably more relevant, because that is kind of a broader way of looking at reproduction of the snapper grouper species there, because some may not form aggregations. The location of spawning areas is probably even more important than just focus on the aggregations.

That was one of the recommendations that the SSC had. The other one was relative to Action Number 5, track movements of adult fish. There was extensive discussion on using acoustics; and one of the things I forgot to mention in my presentation that we also have acoustic receivers on a number of the traps to see if we can pick up tagged fish or tagged turtles during our survey. That was an example of how we add a simple piece of equipment to a trap that may collect very valuable information relative to movement over a variety of species.

MR. PUGLIESE: Yes; and the issue on spawning, I think that is going to be revised in any of these ones, because I think what was stated in the past is the reality of what the condition is in the South Atlantic relative to snapper grouper species. The point of trying to expand and provide additional functionality to vessels that are already in the water ongoing I think there is going to be a critical opportunity to advance using multibeam capabilities, our becoming autonomous. There is a lot of opportunity to advance far beyond the baselines that are being collected in some of these systems.

MR. HOOKER: In those recommendations; do they have like a time period for the ongoing monitoring? I think from my point of view, these basically sentinel monitoring sites and long-term monitoring programs are great, but I didn't know if the council had kind of set bounds like this is a five-year plan, a ten-year plan.

MR. PUGLIESE: Yes; under this there is actually stepping stones in terms of what has to be produced in a certain period of time to be able to revisit and look at these. Those are still being pinned down, but they are in the stages of 5, 10, 15; different ones like that. That is in specific discussion about – some of them it is really going to be when are you really going to be able to see some of these types of things and they are going to be probably on the more out timeframes. Those definitely are integrated into the more comprehensive system management plans.

AP MEMBER: Some of these MPAs were obviously set up to protect habitat, right?

MR. PUGLIESE: Well, protect habitat for the deepwater snapper grouper species.

AP MEMBER: Are you looking at the quality of habitat or how habitat might change and therefore increase the benefit to the species?

MR. PUGLIESE: I'm not sure it gets that detailed into some of the habitat characterizations. I think it is supposed to look at change over time; but that definitely can be refined in the way this leads out. I think you have baselines from which to start. That definitely needs to be added in. I think one of the first things is really to see how much really is already accomplished in many of these different places and then set the baseline.

AP MEMBER: Right, I mean I think mapping is always a first step, but then you want to look at monitoring for quality and not just quantity, so I would suggest putting that in.

AP MEMBER: I was going to ask a similar question but on the second page of that list you had; it says generate habitat classification maps. How are you going to get habitat data? Is it just bathymetry? I know some of them are very deep.

MR. PUGLIESE: The last one really is getting to the point that we were discussing a little bit about being able to really get to using backscatter and be able to build the detailed distribution maps for habitat types, as well as having groundtruth; so you get to the point of actually building true characterization maps. This is the longer-term goal.

DR. SEDBERRY: Some of those MPA sites, we did submersible dives in them in the eighties and early two thousands. Right now Andy David and his group with the Beaufort Lab also are doing ROV surveys in them every year. We're getting more and more habitat data on them every year. I think with the acoustic surveys that are being done and then having that groundtruth with ROV and trap videos and everything else that is going on; I think we'll have a really good idea of what those habitats look like and a baseline to look for changes.

DR. REICHERT: Yes; and a lot of these sites actually include historic MARMAP sampling sites, so we have some information there, if nothing else, on species distribution, length and age distributions in those areas.

MR. GEER: Marcel, based on the work that MARMAP and SEAMAP are doing now, how much of this can you accomplish versus additional new funding?

DR. REICHERT: We are continuing to sample our historical sampling, so I think we can accomplish a significant part of that. I do believe that additional characterization of the MPAs is probably necessary, which we cannot do within the timeframe that we have available. I would say it is a combination of the two. But that is also I think in the needs – I may have taken it out but I think there is a lot of opportunity for coordination and collaboration in order to complement surveys rather than duplicate surveys.

MR. PUGLIESE: Yes; and to that specifically, I think one of the big things that we were hoping to do – and it has been mentioned a couple of times – is the opportunity to add additional technology; as you mentioned, carrying AUVs or outfitting it with fixed multibeam systems and – this is kind of all connected – the opportunity of building a mapping strategy for the region, identify all the different partners who have the ability to do processing.

What you end up doing is you are maximizing both the operation of the existing surveys with new technologies and then other vessels – also looking at other NOAA vessels and how you can expand that. Then it even gets into the idea of citizen science opportunities to outfit other vessels with capabilities; and again lining up either ongoing activities, other capabilities in the region and being able to advance a number of these different ones into the future.

I think that is the bigger plan to accomplish this and it is only going to be through partnerships and the ability to work a lot. Like you said, you could be collecting the information but we're going to have to figure out how there may be opportunities to work with other people in the region to actually work up the habitat characterization maps or different things like that; but it provides that opportunity.

MR. GEER: We went past the break, and we're going to move onto the research needs and linking oceanographic and managed species.

MR. PUGLIESE: Let me do that real quick just as context before I get into – what I wanted to do is at least highlight what is in Volume 5 of the Research and Monitoring Plan; but what I'll do – it is a very short thing that I've got for linking the oceanographic. Let me do that so that then we can just look at the actual document itself.

This is about the shortest presentation. At this stage of the day, I think you're going to appreciate it. What I wanted to do, as part of this whole discussion – and it has facets that we've already discussed about opportunities to connect information systems – is to look at linking the oceanography managed species, EFH and fisheries.

One of the things that we've been really working hard to do is cooperate with our Ocean Observing Regional Association, Southeast Coastal Ocean Regional Association, SECOORA, and other regional partners to advance some of the different really key things that begin to connect the oceanographic information with fish, fish habitat or fisheries. These were some of the different areas that are going to significantly benefit.

The reason I've raised some of these is that in the most recent SECOORA five-year budgeting plan, there are actually some direct connections to some of our partners such as North Carolina State University and others, our longer standing work with Harbor Branch and different partners; but to get to some of these key habitat-related components such as refining the current water column designations of EFH areas of particular concern, of the water capabilities like the Gulf Stream getting three-dimensional characterization of the Gulf Stream, understanding its dynamics relative to the species migrations, et cetera; the Charleston Bump complex so we can really understand the operation of how that gyre is trajecting organisms throughout the area like, for example, gag over time in terms of settlements into north all the way south in the area, as well as the Florida Current.

We do have those designations but we have never really gotten the refined three-dimensional characterization that really drive this. With some of the newer work we're doing in collaboration, hopefully some of those types of things are going to advance. Additionally, to provide oceanographic models linking benthic and pelagic habitats and food webs, so we begin to expand the discussion of almost a one-dimensional view and really begin to understand how the oceanographic characteristics are driving the habitat distribution and ultimately really also affecting the species and then ultimately the overall food web.

To provide oceanographic input parameters for ecosystem model; we've engaged again the partners of SECOORA as well as a number of regional partners to build the next generation of an ecosystem modeling suite that hopefully we will be seeing that advance fairly soon to have the ability to do specifically that.

It is to begin to build in circulation models, different types of primary productivity, et cetera, into a new generation of ecopath/ecosim and other models that are anticipated into the future. Also to provide models to document upwelling events; there is a lot of discussion in our region about climate change; but then the climate variability of the upwelling off of Florida, the increased number of upwelling events, we still have not really pinned down and characterized that event either historically or really brought it into a predictive model.

I think we actually are at that stage to begin that; if not really establish where we need to have more observing capability to refine that type of information, because it is influencing things such as the distribution of black sea bass south in the region. To integrate the ocean observing information into stock assessments, be able to begin to use some of these.

We touched on this in the past with the opportunity to build things such as – George specifically remembers this with gag grouper, trying to build the temperature-based index. I think we have some opportunities to collaborate further to advance those types of things for our region. Again it is with the partners.

To facilitate the ocean observing collection, to support the use of these areas so getting – one thing that I'm really pleased about is in that last iteration is getting physical characterization of these habitats; not only getting, we're talking multibeam, we're talking about getting benthic habitat characterization, but getting the actual pelagic water column characterization.

Now that is something that is very different in our new spawning Special Management Zone efforts, but I think that is what the intent is across all of these managed areas is to understand that true physical dynamics of the ocean. Some of those are again in process with individuals to either developing the models for the region such as North Carolina State or with our partners with Harbor Branch, FAU, and COSERT.

And to some degree; that's why I brought on we have a real opportunity to advance this, so you are at the right place at the right time. To integrate ocean observing system capabilities into the research; and this is specifically what we're doing is Volume 5, we want to advance that. In the Ocean Observing Association, we actually had a ten-year build-out plan which had documentation of these things I've mentioned all the way in terms of characterization; but also even looking at buoys, looking at implementation of glider arrays; a lot of different tools, vessels of opportunities to advance new technologies.

Here is an opportunity to advance those kinds of things with the way we present it in the Fishery Ecosystem Plan and specifically with regard to oceanographic characterization and beyond in modeling that will be probably pretty well combined or discussed in combination. To collaboratively score to begin to begin to connect these different information systems more effectively.

I think one of the things that I mentioned earlier is the opportunity for us to advance. Where you've seen kind of the footprint where we are with the building of services; there is an opportunity to go even beyond that point with some of the ARC/ESRI online capabilities that we may be a test bed for the South Atlantic to kind of look at a regional application of that, which I think would be excellent and at least put the right words into the chief scientist with the ESRI to make it hopefully happen.

To migrate, as I mentioned, to looking online for organization so we can provide even better access to the information and capabilities and work with partners in the region. That was the snapshot of the oceanographic that I wanted to integrate, because it is going to play a major role as we move forward. What it really does move to is what I wanted to jump into – and Marcel has already introduced it.

What we'll be doing is a revision of Volume 5, which is the South Atlantic Research Programs and Data Needs. It is very timely, because at this stage we're also revising a SEAMAP five-year plan; and in the SEAMAP five-year plan it not only discusses the SEAMAP program, it discusses the entire connection of SEAMAP to MARMAP to SEFIS and beyond and highlights some of those points that Marcel had indicated is that we do not have a plankton survey, the opportunity to look at pelagic surveys, and some of those are there.

There is a real timeliness of that moving forward with the opportunity to inform, expand and refine the information presented for those programs and those programs in combination within this document. What you do have in the document is you have the overall citation of this, but then what is integrated is the council has mandated research needs in the way Magnuson was annually we present kind of a suite of research needs.

A lot of them are more specifically tied to things that are going to have to happen within that year or high priority species that within X number of years from that point are going to need to be done. That is what is presented here. As one of the first times I think we did this, we're in a number of generations beyond that.

That would be included in here, but I think there is really an opportunity to expand that into ecosystem needs and other habitat needs that really were always kind of on the background and done totally separately. There is an opportunity to go beyond that within this document. This is where the council's priorities are.

The other part of the document went – and this was kind of the way we used to do it; and this actually is still probably a good effort, because what it does is it provides kind of the longer-term scope for the overall FMP. It goes by FMP by FMP and discusses the research needs by the fishery management plan.

Now again there are probably opportunities to – not probably, there are opportunities to integrate the most recent information or efforts for research. For example, on the Deepwater Coral research we had set and put together a research monitoring plan for deepwater corals. We put together and refined the Oculina Research Plan not too long ago; so those are going to get integrated into here.

The system management plans, as I mentioned, would be folded under the snapper grouper components and highlighted and connected within this document. But then it goes beyond that; because once it passes the councils base information, it gets into the partners. For example, it integrates the interjurisdictional priority research needs within here and it is based on ASMFC's; so this would be adding in the most recent information.

What it does do is it discusses the individual species needs and actually has the overall – the latest draft; I think the way this ended up being integrated as Appendix 1 within this document, so we have an opportunity to refine and clean it up. Again, this is to be the entire system. We do include the ongoing research for highly migratory species within this document; so updating and refining what is within that is something as well as any other agency activities.

One of the other things I think that is going to advance on here is how some of the newer programs really weren't even in existence. Like the Landscape Conservation Cooperative has

really all come to bear with the research opportunities, with the connectivity between systems and all types of things. That can either be directly integrated in here and/or the Conservation Blueprint is going to be a part of the Fishery Ecosystem Plan.

The idea is that we work very closely together on making these – talk to each other and work together so that it gets integrated into the bigger picture under there. This would be the vehicle to be able to integrate the research components under that and to advance that. As I mentioned, when you get into the programs, it gets into the fishery independent, the research programs. It gets into MARMAP/SEAMAP; and actually at this time SEFIS I don't think existed actually.

DR. REICHERT: No, SEFIS didn't exist or it was just about to start.

MR. PUGLIESE: Yes; just kind of emerging at this point, so the whole SERFs combination of the three programs needs to be – but again with the five-year plan for SEAMAP, a lot of that is going to be reviewed, developed and finalized, so we'll be able to draw and use the most updated information for that.

It does get into even state surveys; but that is under the umbrella of still under the SEAMAP/MARMAP bottom mapping as part of it. Again that is part of that bigger – that all is embedded under the ongoing fishery-independent surveys. However, it does go beyond that and goes into things such as the General Coral Reef Conservation Grant Program activities, highlighting what's going on through those.

The Southeast Fisheries Science Centers, EFH and species program; and this was here and elsewhere to have SEFIS integrated within here. The research programs at Grays Reef and the sanctuaries within the regions, the Florida Keys also and ocean exploration activities in our region. I went into it before, but the Ocean Observing System; and that has matured a lot since its original discussion within here.

There is an entire section on the original South Atlantic Ecopath Model efforts that have gotten us to where we are now. We even had indicators of ecosystem health, and that was based on again the connection to another regional partner. The Southeast Aquatic Resource Program had developed a habitat plan, which we integrated directly in here and used some of those target components directly within the Fishery Ecosystem Plan.

I mean this really, truly was a regional effort in where we got, and a lot of that has evolved with say the Landscape Conservation Cooperative has been building indicators, also marine as well as inshore, inland and riverine, which we hope to add into here. This is the compilation of everything that is going on in the Southeast Region or South Atlantic up to that point.

As I mentioned, we had things such as the most recent Atlantic States Marine Fisheries Commission Interjurisdictional. It included appendices where we can integrate those to the most updated form that is going to be the best in this case instead of necessarily having it. However, there is some benefit of having some of the stand-alone documents, the original documents to be able to pull in and draw. That is a balance that we can do.

Then the digital age, which I expect this to be a digital document, because the last FEP was this big; and if we do what we would like to do here – it is like our briefing books; those are all

digital now – it will be able to be built with links and connections and actually make it the entire FEP operational at a digital level like it never was, especially with connections to spatial information, et cetera.

That was the snapshot of where we stand with Volume 5 and some tidbits on how we advance to get further on that. I wanted to kind of just open up the discussion on other research areas or documents that we need to make sure we add in and just begin the discussion, because some things are already interjectory and some things we need to just start.

MR. WILBER: Roger, I just have a question about something you said very near the end there. You're talking about making the next FEP a much more digital kind of document. Does that mean essentially the FEP now becomes a website with web pages that have links that are maintained or does it mean now you're just going to have a bunch of PDF documents and have links embedded in the PDF documents?

Because, PDF documents still means writing a lot of text and the text becoming out of date and it becoming difficult to keep that text up to date; whereas, if you're talking about a lot of things moving around quickly, a traditional website would make a lot more sense.

MR. PUGLIESE: Yes; and I think the latter is hopefully where we can go. That's why I mentioned some of the partners we have with the technology and different things. I think if we advance the way some of this information is already both on the webpage as well as the spatial connections with going to an online system ArcGS online system, we could probably make something like that a lot more realistic.

I mean, we already have a digital dashboard that we have advanced as far as we want. I think there is fully the opportunity to create essentially what you're saying is like the Fishery Ecosystem Plan Page. Then it is not just a static system; it has it partitioned out that identifies the document information that is connected to support that information.

It has real opportunity to have a lot of other types of connectivity to partners in the region, how they are accomplishing research needs. There is a lot that has to be thought out further on how we advance that; but that is definitely well within and more likely a realistic way of approaching it. We've got kind of the core of that to start and we just need to advance that.

Keep that in mind as we're developing the sections and everything as how to operationalize those and have linked systems that we can use, knowing that is something that could be added in and expand this and be a lot more of a useful tool into the future; because I think that was one of the problems before, it is just a lot of PDFs, a lot of information and didn't even have linkages.

MR. WILBER: This is an important crossroad is now that the teams are beginning to meet and actually develop stuff. Tasking the teams to revise 50 pages of text so it is current is a different task then asking the team to basically design a website that covers the topic.

If you want linkage to historical documents and other things like that, you are asking the teams to collect those documents and deliver them as a package along with some other text that kind of puts all the links in some kind of context. If we're really shooting for a website, which I think would be a great thing to do, then we probably should talk with Brett and maybe adjust the

direction that the teams have been given so far and the marching orders that Brett has for orchestrating the teams.

MR. PUGLIESE: Yes; and that is something we need to think long and hard about, because I think the bottom line though is in certain cases a lot of the information still needs to be updated. But, you're right, the perspective you go in and doing the update in terms of having links to other information and different things may be there.

However, we've got to talk more about that because it may be a stage system where we really do have to do the review of those sections and then in the next stage of the process really look at how you operationalize this for a web use, et cetera. We don't want to get lost in the technology before we get some of the work done that needs to be able to update and have at least the most recent information developed. I think it is going to vary on the different sections on how much you have to do too.

MR. WILBER: Right, but let's use the South Atlantic LCC as the example. You don't need to write five paragraphs summarizing the intent and status and future direction of the South Atlantic LCC if the South Atlantic LCC already has web pages that cover that ground. Then in the FEP you just provide links to those web pages and let them speak for themselves in their own words. Again. that is a very different task then asking a team member to go in and digest all the information that is on the South Atlantic LCC web page and then writing essentially a 1,250 word essay about the status of that group. I mean, it is a very different kind of task.

MR. PUGLIESE: You're right; I think the one thing that I envision though is that you've got to look at both sides of that. If you just have something that jumps away totally to something separate and doesn't put it in context of what the Fishery Ecosystem Plan is and what its value and what the partners are contributing; then that is lost.

I've seen that enough in other places where it just, okay, you have a link here and you jump to somewhere else and you're all of a sudden totally out of context of where you started and it is in a totally different trajectory. I think that is why we had originally talked about the Digital Dashboard as kind of an evolution there, but we just have to have more discussion on how to advance it; because what I don't want to do is to lose the momentum of getting some of the revisions done up front without just saying, well, we can just go to a link here and a link here and a link here without being able to make sure that some of that core work needs to be accomplished.

MR. WILBER: We're not just providing tables of links but providing text that is in the context of links. Where the text largely serves as jump-off pages is a different text assignment than writing summaries of somebody else's web site. Again, I do think a lot more thought has to go into it before; but again the teams are already meeting so it needs to be sooner than later.

MR. PUGLIESE: I appreciate that. Ultimately that was the vision to operationalize as much as possible. It was kind of tackling one step at a time, because we didn't have that necessarily integrated into the design, development and expansion of a website and everything else into the system yet other than what we have as the core activities. To some degree, that is why I had been investigating working directly with ESRI to look at how we can operationalize some of these capabilities beyond what we have.

I think that may make something like this advance a lot faster, so then we could move that I think hopefully quicker into the future. We'll discuss that further about how to do that; and you almost have to story board exactly where we could end up with this, because I think that ultimately is definitely where we want to be, because then it makes all the connections. It makes it a lot more function, has access to policies, and does more what is intended to do than what it is right now.

MS. DEATON: Just one thing to keep in mind is that every time an agency changes or reorganizes their web site, those links become non-functional.

MR. PUGLIESE: Yes; we even ran into that with where we were trying to do some linkages to NOAA sections for the GIS sections. All of a sudden in the background nobody said anything, and the link to this data source that was streaming in the background is gone. Some of that happens, too, especially in that spatial world, too, It's operational that way, too.

MR. HOOKER: Just a quick question again on the timeline for when – I assume this is coming back to the AP at some point when it is drafted or no?

MR. PUGLIESE: I had laid out the overall timeline. I mean, the bottom line is the entire Fishery Ecosystem Plan is anticipated to be completed in 2016. We have a couple trajectories of the habitat sections being developed with the idea that those drafts are going to be available and be able to come back to the AP and the council; because the council is at a point to be able to look at these different things.

Some of the adjustments of the timeline I had originally presented were acknowledging those stepping points with the next two meetings in April and November. Originally I was thinking we were actually going to get something done earlier, but then you have those and you have to integrate the council's deliberation say in June and then December.

Yes, we do have some very specific timelines to get those together and move it forward so that they can be finalized, integrated and put together as one complete package and the ultimate FEP be finalized in 2016. If we can get it closer to a digital version at that level; that would be the best-case scenario for all of us.

MR. HOOOKER: Thank you for refreshing my memory from yesterday; yes, very aggressive.

MR. PUGLIESE: Are there any other thoughts or comments on the general issue of advancing this information on research? I think one of the things – and I mentioned before why we brought some of this with Carter, with Laurent, with Brian, a lot of the new other research activities going on in other different areas. It is going to be important to integrate that into here and highlight that.

The whole issue of the research relative to artificial reefs; we never have really gotten that integrated into there, because there is some of the best characterization work being done in some of those areas. All of that kind of pushing and getting new faces, new players into the game is very specifically to be able to advance our – and then technology capabilities.

The discussions we're having on expanding the capabilities at the existing ongoing systems, the fishery-independent survey, the expertise you bring to the table about the knowledge of those

new AUVs/ROVs, the applications of how you can do a better job in terms of getting the right information and back scatter to do that; that is all going to be really critical as we move a lot of these things forward. I think that is an important part of this discussion to advance the research and data collection needs in our region. Are there any other thoughts on that big challenge?

MR. GEIGER: Is there a particular document or information where the South Atlantic Fishery Management Council has identified its highest research needs related to its mission for management?

MR. PUGLIESE: Yes; as I mentioned in this document on the front; that document is something that we put together. We do have that; but it is primarily tied to kind of the most immediate needs. It isn't as big of a bigger picture into the long term. It is very specific on where they anticipate these assessments are going to happen within this period of time; that we need to have these collected so they can support the data workshops and monitoring capability, different things like that.

I think it has become a good focused effort, but I think what hopefully we can do here is look beyond; and that is why I mentioned things such as the SEAMAP planning document that talks about things that we have to be looking at such as pelagic surveys. If you really want to get to ecosystem-based management, some of these things we have to get off center on.

MR. GEIGER: Is there a particular vision document or an operational plan that has been laid out to sort of capture what we currently have and then five, ten years down the road what we need based upon new technologies, new information, new partnership collaborations on this? I'm looking for sort of a vision statement, so to speak, that sort of puts this out rather than all these oscillating links out that goes out to infinity.

Where is that one vision where you could see conceptually, either in one dimension, two dimensions, or three dimensions where this is laid out; where the intention of the council is to go? I may be asking for something that is impossible.

MR. PUGLIESE: I think what you're asking for is the effort we're essentially in the middle of right now. With the Fishery Ecosystem Plan the intent is to, I think, crystallize that longer-term vision of how we advance all these things to support true ecosystem-based management in our region.

This is the opportunity to bring these different trajectories kind of on the same course to be able to understand. I think there is a lot or really good pieces that are going to happen. That's why I bring them together like the SEAMAP plan, the efforts that we're working on. I think it is before us; we just have to figure out how to make it all get that better vision.

MR. GEIGER: I would just add a note of caution, you know, and I just use the old refrain are you a lumper or a splitter? All right, you don't want to lump it so big that the objective, the accomplishment of what you are trying to achieve is just unmanageable. We're seeing on several other ecosystem-based approaches, whether it be international, whether it be regional, whether it be species direct; some of that stuff has really gotten into the – it becomes almost unrealistic, because people cannot comprehend in some kind of spatial terms what needs to be

done now, what needs to be done in five years, what needs to be in ten and the allocation of resources to achieve that.

Again, I think obviously we want to do something that is meaningful, that's objective, that's realistic, and that his accomplishable; we can accomplish what we say we're going to do. Again, I like to be visionary and what we're trying to do as well, but also somebody is going to ask what have you accomplished to achieve your goals and objectives? I would hope that we're not losing sight of that.

MR. PUGLIESE: Truthfully, just a last statement, because I know everybody is overwhelmed with these. I think the bottom line is that we have a number of different things going on like the system management plans for that specific area addressing this, the council efforts. But we also have opportunities with where things are going on addressing some of the climate issues, where things are going on trying to do the ecosystem modeling.

In the ecosystem modeling effort we're involved in, some of the key players in there are our Chair and Vice-Chair of the SSC, so that we have a reality check on what do we really need to do to be able to analyze it at the SSC level and then what the council needs for tools for management into the future.

There is a real serious reality check on trying to advance these, but do it in a state so that we don't end up with something that creates some ecosystem information system that is really pretty and looks at a lot of things but has no applicability in the real world in habitat conservation or fisheries management or resource management. I think we're strategically connecting some of those to make sure that it doesn't just become some pie-in-the-sky effort.

MR. GEER: Anything else from anybody this morning? All right, it is twelve o'clock. We're schedule to be back here at 1:30. Jason Link will be here at 1:30, so let's try to get back a few minutes early so we can keep on schedule for him. We'll break for lunch now. Let's be in our seats by 1:30.

MR. GEER: All right, folks, let's get started again. We are going to be on a webinar this afternoon, so we're going to have to be a little bit more formal. I will reintroduce myself. My name is Pat Geer; I am the Chairman of the Habitat AP. This afternoon we are starting off with a presentation from Jason Link from NMFS. He is going to give us an overview of their ecosystem-based management policy. It is Attachment 9 in your handouts. Jason, you have the floor.

MR. LINK: Thank you again for your attention. I want to talk to you about ecosystem-based fishery management and some of the things we're doing for the agency. I am Jason Link. That is incorrect; I'm not at the Northwest Fisheries Science Center. I am actually based in Woods Hole, but I report to our front office in Silver Spring.

I am one of the three senior scientists the agency has and my portfolio is to deal with ecosystem-based management and ramp up programs and efforts on that nationally. We really need to, can and we're committed to do ecosystem-based fishery management. We want to make sure that is clear; and that is why we're doing this policy statement. We want to recognize there are a lot of benefits to doing an ecosystem-based fishery management.

We also want to not come in being the federal partner saying thou shalt do X, Y, and Z. We would rather come in and say here is a menu of options we might want to consider X, Y, and Z. In fact the last bullet points out perhaps some of those this council is already doing a good job, and maybe there are a couple other things we can ramp up analytically to get in place or other things we might provide to the councils all around the country.

Really it is to develop these partnerships and continue to do that as we explore how we can make ecosystem-based fishery management a bit more operational. That is what we're here for; that's what we're about. Why is this important? I tried to pick a couple examples that were germane to this region.

Lionfish populations have shown up, you all know this better than I, and they really are affecting the food webs and a lot of the productivity in the resident stocks. Are there ways we can identify risk and even some mitigation via things we're calling management strategy evaluations, some of the food web modeling, some of the ecosystem modeling, multispecies modeling that we're developing capacity for; and even maybe explore the development of a fishery to deal with this among many different options.

This has gotten our attention and we're seeing examples like this around the country. The other thing in this region as another example that is not trophic in nature but is physical is what we call the Gulf Stream wiggle and the recruitment. The Gulf Stream is projected to increase its meandering as climate change continues to impact the ocean environment.

With that change, it is going to wiggle more and more and perhaps ultimately entrain more of the warmer waters offshore. That is going to alter the thermal habitat, the temperature of habitat for species in this region. We think that the projections we've seen could actually impact recruitment success.

That is something we want to get ahead of, and I'm sure you all are interested in this as well, and we think there are some approaches we're developing that are simplified risk analyses all the way up to some pretty sophisticated models with management strategy evaluations. Those are just a couple examples so that you know we're listening to you when you flag these issues.

Also, we're flagging these issues and we're trying to say, hey, maybe there is something here that is similarly going on in a different region, and maybe there are some approaches we can develop that can help us handle these both regionally and from a national perspective to be consistent within the National Marine Fisheries Service.

The other thing I always try to do is to clarify linguistic uncertainty, which my college professor friends tell me means people don't know what you're talking about when you say this subject. Ecosystem-based management means all things to all people. I don't know if the webinar can show it but I will try to walk through it in the room.

On the bottom is how we've typically done fishery management. We do our stock assessments, we get the age and growth and the biology, catch and we go forward. What we're moving towards is an ecosystem approach to fisheries management, but we still have a stock focus but we're trying to bring in some of these other considerations. That has been ongoing for a while. Both of those are still delivered in fishery management plans.

Where we're moving towards is this ecosystem-based fisheries management, the third one up from the bottom, where you have a bunch of species and you're trying to handle them as a group or as a complex all at once. I know in this region there are several species where you're doing that. Overall as a system, geographically specified, how do you handle some of these considerations and perhaps package that in an FEP; and you all have been leading the way on that with a prior version.

But this is in the context of ecosystem-based management of multiple sectors and uses of the ocean; and inasmuch as these things here on the top impact the fishery or the fishery impacts them, we kind of need to pay attention to it. We fully recognize that the delineations between these different levels are pretty fuzzy and we understand that.

What we're trying to do is make sure we don't get in trouble by missing some factors down here that are driving the bus on a stock or the dynamics of a population and also that we don't miss something that might be going on at a system level, a system of a fishery itself. It is useful for us to kind of walk through these different levels of what we're talking about just to make sure that when I say ecosystem-based fishery management and I'm thinking analytical tools up here, someone is not thinking down here or vice versa.

That is why I step through this and take a few moments. If you have questions, just interrupt me. We can have a dialogue. What we've done to kind of codify this in our attention to the topic, our prioritization of this topic is we've developed a policy statement; and you have a draft copy of that. The components of the statement you can see here. Some of it is pretty boilerplate.

I am a biologist, I'm not a lawyer, I don't play a lawyer on TV, nothing like that; but I've had to get into some of the legalese on some of this. The things that we'll spend a little bit of time on is the definition of EBFM, the policy statement itself, and then some of these guiding principles. That is probably the most interesting parts of this that I point your attention to.

The policy statement effectively says the Fisheries Service strongly supports implementation of EBFM to better inform decisions and help achieve and optimize the benefits for marine fisheries by evaluating tradeoffs among and between fisheries; commercial, recreational and subsistence, aquaculture, protected species, biodiversity and habitats while maintaining resilient and productive ecosystems.

What I can tell you is that statement took a dozen people four months and a lot of conference calls, as I'm sure you can appreciate. It has had a lot of look, but in all sincerity if there is something there that we're missing that you want to see or if there is something there that you have a little bit of heartburn over, let's have that discussion.

That is why we're going to all the councils presenting this to everyone. Similarly, we define ecosystem-based fishery management, cognizant of that info graphic I showed you a few slides ago, as a systematic approach to fisheries management in a geographically specified area that ensures the resilience and sustainability of the ecosystem; recognizes the physical, biological, economic and social interactions among the effective components of the ecosystem, including humans, and seeks to optimize benefits among a diverse set of societal goals.

We looked in the literature. There are over 40 definitions of ecosystem-based management in one flavor or another, and this is an amalgamation, and also a dozen people over several months trying to hash that out and that is what we came up with. A couple things I want to highlight to you is we're looking at all the oceanography and certainly the biology and ecology, but we are really trying to emphasize the economic and social interactions.

We had a couple people who didn't think that was clear enough, because social interactions could be amongst whales and things like that. We included humans just to make sure that was clear; but really it is getting to dealing with the tradeoffs among the different goals that we often see in the marine ocean uses even within different fisheries. That is our definition.

The most important thing from my perspective for you to give some attention to in the document are these guiding principles. You will see this, you've seen this before; it is very similar to our National Climate Science Strategy; it is underlying a lot of our thinking. To do anything we have to have a foundation of science, and that is at the bottom.

We really are pushing to advance our understanding of ecosystem processes and those relationships. From that, how can we do the ongoing efforts and inform them from this novel science to get into ecosystem level planning and locate those different objectives; be they the different tradeoffs among the major mandates, different elements of different fisheries, one fishery, another fishery, and those kinds of tradeoffs; how do we deal with that?

That is more or less what we're thinking of with FEPs and things of that nature. Then from that how do we prioritize where the risks are and what that would look like in a given ecosystem and the different components of that system? What do we want to make sure we emphasize or prioritize? Then from that what do we do with that; how do we address these tradeoffs, what are our options?

This is where we're doing a lot of capacity development analytically to develop things like management strategy evaluations to come up and test different options virtually. I like to joke that in my hotel room I will often get a model of the ocean going and I'll kill all the bluefish on the east coast; and no one is mad because it happened in my computer, and it didn't happen for real.

What you do with that is you see what could happen, what might the trickle-through effects be? You run enough of those, thousands of those different simulations and you kind of come up with a robust universe of what might be okay to deal with and what might be problematic. From that, we can then take that and incorporate it into the management advice, both at a stock level or even at a system level.

There is a fair bit of system-level reference points that we're looking into. The ultimate outcome of all this is to maintain resilient ecosystems. In the document itself we unpack these a little bit, but it is still a very terse, very quick bullet-point type thing so we can walk through that if you like. But that is our thinking is the foundation of science ultimately to give wise management advice to maintain resilient ecosystems.

The next steps for this, it has been open for comment. We're going to close comments the middle of next month; kind of craft those, respond to those, draft those, revise the document and

then we're hoping to have the policy statement finalized in early next year. The question we often get, and I want to address before it comes up, is what's next, how do you actually do this; what does this actually look like; what is the implementation plan?

We're developing an associated roadmap that unpacks this in a lot more detail and gives things like performance measures and what might one want to look like, what might the agency want to do to shore up some of these areas; how can we build capacity in one element or another; what might be some road markers along the way that we want to make sure that we're getting to?

That is still in development, but it will be lagging behind the policy statement by a couple months, but I just wanted to make sure that you're aware that is coming. If you want us to come back and brief you on that, we can do that or keep the dialogue going, whatever you like. The other thing I would mention, as we sat back and have responded to various calls from Congress and various calls from various advisory panels, what struck us is Office of Sustainable Fisheries is doing an ecosystem plan analysis.

We sent a Science Advisory Panel Report on EBFM earlier this year. We finalized our climate science strategy earlier this year. We're developing the policy statement, which I'm talking to you about now. We're doing a survey of elements of ecosystem-based management in the fishery management plans around the country. There is a taskforce that Lenfest is looking at.

We're trying to do a next generation stock assessment improvement plan. We're doing the roadmap that we mentioned; and this coming year all around the country each of our Science Centers is going to have a program review, and we've had those for the past several years. This past year, for example, was on protected species.

This coming year each of the six Science Centers is going to have an ecosystem program review. There is going to be an opportunity to again continue the dialogue and discussion on this. When we step back and look at it, there is actually a fair bit of activity ongoing in the area. Our approach is let's try to coalesce this and head it in a consistent way, but in a way that is regionally appropriate and frankly build on and recognize the progress that we've already been doing in many, many places.

You all, as I've said, have led on the FEPs and several other facets of this; so let's just keep building on that. We want to, as I said, organize that, coalesce that nationally and build on those successes. I think with that, Pat, let me turn it back to you. I tried to keep it short and sweet.

MR. GEER: Thank you very much, Jason, we appreciate that. I'll start taking questions. I'll start with Brian and then Jaime.

MR. HOOKER: On the ecosystem program review, I participated, I guess last year or maybe even the year before that; that was a protected species program; so are you going out to federal agencies to ask how they use the science for ecosystem-based management as well?

MR LINK: Three years ago we did data, two years ago we did stock assessments, and this calendar year we did protected resources in each of the regions. The west coast was a hybrid with salmon and marine mammals and so forth. What we're doing is what are we doing within the National Marine Fisheries Service on those topics? Next year we'll do ecosystems; but I

think, if I'm hearing your question correctly, is we're also taking a sense of what are we doing with all of our partners, be they federal agencies, states, tribes, what have you, as is appropriate.

Where that is coming together in a region, we're trying to provide a forum to have that discussion; what are we doing well, where are the gaps, what can we improve, you know that type of things. Did that answer your question?

MR. HOOKER: Yes; I wasn't clear or I wasn't sure if like at one point they wanted to know how we're using Science Center Data, how other federal agencies – are we meeting needs and that type of thing; so I didn't know if the ecosystem component would have that same type of outreach regarding what are other federal agencies and I would imagine the council's needs regarding ecosystem-based science and having that feedback as part of that review.

MR. LINK: I know one of the guys who helped write some of the terms of reference for that; and I am pretty sure that there will be a sense of what are the councils' and other partners' needs, commissions' needs, and are you meeting those is one of the first one or two terms of reference. I'm pretty sure that will be taken care of.

MR. GEIGER: Yes, Jason, I guess my question is as I understand it, multiple agencies and bureaus are embarking on these similar activities. Again even within DOC; are what you guys doing with NMFS, are they being coordinated with NOS and some of the other stuff within Department of Commerce?

Then, secondly, I'm most familiar with Department of Interior, and I remember one exercise we did as we started to look at ecosystem-based management. I mean we blue-skied the Continental Divide, the Continental Shelf, basically looking at Department of Interior responsibilities. What we quickly found is with so much partitioning among responsibilities, among not only bureaus within DOI, but also other federal agencies; notably, NOAA Fisheries and some of the other stuff; there were major disconnects on who is doing what when and is there any kind of coordination?

I guess I would ask you are you guys involved with the partners, other federal partners, for example, in some of the work that you're initially doing, laying out some of these conceptual steps and some of these policy statements?

MR. LINK: Let me elaborate just to be fair. On the last question first, we meet with BOEM, for example, up here on offshore wind a lot. When there are birds, we meet with some of the DOI folks regularly, et cetera, et cetera. When we get into the fisheries management and we're purposely focusing on fisheries; our partners are probably more strongly aligned with the councils and commissions, and states than they are even other federal agencies.

I think that is rightly so. That said, in some regions it makes a lot of sense – for example, let's take habitat. In probably this region or the Caribbean or the Pacific Islands we have pretty solid partnerships with NOS as it pertains to some of the coral reef programs and at least cross NOAA types of matrixes organizations.

We are working on that and I think that leads me into your first question. We are interacting with NOS and OAR particularly on some of the model development, some of the physical

coupling and particularly the climate drivers and those projections and downscaling those to a given region. We're interacting with them and have joint meetings pretty routinely. I can elaborate on any point further if you would like.

MR. WILBER: I'll preface my question with noting that I am a NOAA employee. As a NOAA employee, over the years we've seen more and more crystallization of what ecosystem-based fishery management is and are seeing more and more guidance or direction as to what the stock assessment side and the fisheries management side that the Fisheries Service should be doing differently under ecosystem-based management.

My question is for those of us that are in the protected resources side and the habitat side of the house, we're not seeing much direction yet on how you expect these programs within NOAA to change their operations in response to an overall philosophy of ecosystem-based management. Am I missing something or are we getting there soon?

MR. LINK: We're getting there. As Jaime, the prior questioner mentioned, there are different ways and information flows along, let's say to be fair, different sub-disciplines in marine science; PR in fish is an example. We had a pretty strong discussion should this be EBLMRM, living marine resource management? We kind of recognize the EBFM had some coinage on the street as it were.

It is understood that we're focusing on the fishery sector here; but it is pretty clear when we went to several of the program reviews for PR that I mentioned earlier, we're trying to engage and push along at that level as well. It might not make it clear or it might not come down as clearly perhaps in the PR world or the habitat world.

But in our thinking here, that could easily be EAPRM, or whatever, and then EBFM, but part of why we're doing this is there is a recognition that some of these decisions can impact one another. We need to get systematic and think about how they interface a lot more. It is probably – it is coming. There is work going on there.

There are different organization structures, subcultures, all of this that we're working with; but in our thinking that is definitely not we'll ignore that or we'll get to that later, but we're bringing that along as we go; but we're focusing on the fisheries part of it right now just because of the monikers. Does that help?

MR. WILBER: That is helpful. Now, I think maybe the next slide after this one, that one talks about tradeoffs between fisheries and let's say habitat – so let's just kind of skip that – so in your mind, what is the tradeoff between fisheries and habitat?

MR. LINK: Certain constituencies want to maintain certain levels and amounts of habitat, and in some cases that can be exclusionary to certain activities. I'm not going to come down on a position of that one way or the other. I'm just going to say if you put it at X percent, here is what the ramifications are for all the things that you see up there.

If you put it at 2X percent, here is what the ramifications are. If you protect it at 0 percent, here are what the ramifications are. Things along that line are kind of what we're thinking about. If we're off on that or we need to clarify, we're happy to have that discussion.

MR. PUGLIESE: Just a little follow-up from Pace's, just because I think this is the one beauty of kind of the bigger picture and how you're going to be working with the individual regions; because I think in our region in the first couple statements of the fishery ecosystem plan we very clearly state that the conservation of habitat is the foundation of the move toward ecosystem-based management.

I think we're one of the only ones that also have fishery management plans that are actually habitat plans with the Coral/Coral hard bottom. While other councils may manage under some of the provisions under Magnuson, we actually have that as fish under Magnuson as well as a sargassum fishery management plan.

Hopefully, it is going to be a two-way communication on how we're advancing that; because I look to our deepwater coral systems and the way we did that. That was perceived as protecting all the habitats within that but working between the different things to maximize protection of habitat as well as dealing with the fisheries at the same time.

There is far beyond that to get to the real true ecosystem-based management; but habitat, go all the way back and that in this region has been at the forefront. The group you are speaking to here has been the foundation of providing those recommendations and the effort to the ecosystem plan and the habitat plan before, to make it real and go beyond where we are now. The more tools and capabilities that begin to link those and advance that information, which is exactly what it sounds like that is the focus of the effort now; that will help us advance in this region.

MR. LINK: For the sake of those on the webinar, you couldn't hear it, but my head was nodding.

MR. GEIGER: Jason, I really like this policy statement. I think it is really very, very good. I am looking at the tradeoffs though and one of the things I see is – and I again use the example of our missions are driven – whether you're local, state, federal, private sector, you are driven by a particular mission statement with particular jurisdictions.

Let me take four pieces of legislation, Endangered Species Act, Marine Mammal Protection Act, Invasive Species Act, and I'll put in Migratory Bird Treaty Act; so you've got four specific pieces of legislation that basically drive and put constraints on those agencies that are bound to enforce those. Have you guys had any discussion about some of the limitations or stovepipe that your existing legislation, including Magnuson-Stevens, may place on our collective ability to actually implement ecosystem-based fisheries management?

MR. LINK: Again, yes. There are actually 96 laws, mandates, executive orders, et cetera, that deal with these issues. To just simply answer; that is why we're doing ecosystem-based fisheries management is to take a look at all that and make sure we're coordinating.

MR. HOOKER: I think it is actually the next slide is the policy defines. How far have you gotten in the geographically specified areas part of this? This is one thing I am always struggling with; are we just talking the large marine ecosystem; are we talking about the nested approach that I remember hearing about for so long; nested within nested? Where are you right now with identifying these geographic areas?

MR. LINK: You're familiar with that phrase and you want to have your cake and eat it, too? We're recognizing that our primary dance partners are the councils. That means primarily what we're thinking of is our pivot foot, to use a basketball analogy, is probably a large marine ecosystem scale.

However, a lot of what we do is scaled a lot smaller than that and some of our state or commission partners and a lot of what we do is a lot bigger than that; ocean basins with some of the highly migratories. What we tried to do – and we'll see, but what we tried to do is make this so that it could be scalable with that pivot-foot kind of where the councils operate; recognizing that some councils have jurisdictions on multiple ecosystems, some have them on very different scales, et cetera.

We wanted it to be flexible enough to have that scalability to address the issues that we're facing in a particular region. I know that sounds a bit like a tap dance around your answer, but that is really what we were thinking when we tried to pull this together.

MR. HOOKER: As a quick follow-up, from your perspective you're not going to be defining those geographic areas. It would be up to implementers defining those areas.

MR. LINK: We're trying to have something that is nationally consistent but that is regionally implantable, and we're not going to be the ones coming and saying implement it this way. We totally get – and I think it is one of the strengths of the Magnuson is its regional management and allows local expertise to tackle the issues at the right scale. That is kind of the thinking behind that. I'm not sure I'm answering your question, Brian.

MR. WILBER: Just to clarify; is NOAA still firmly anchored in the defined large marine ecosystems or are we distancing ourselves from that?

MR. LINK: It is a useful moniker and it is a useful way to organize things, but we're not tying ourselves to it. It is just a way to help us organize, generally speaking. This council works in the South Atlantic LME, but you also have other considerations. If you look in the Gulf LME and that council and all the way around the country, it is a useful organizing rubric but it is not one that we're hard and fast, thou shalt do the LME designation geographically and then the LME process by any means.

MR. GEER: Would Chesapeake Bay be an LME?

MR. LINK: I think the Chesapeake Bay is classified as a large natural estuary. I can't even remember what that acronym is.

MR. GEER: I could just see a lot of what you're talking about. I just came back from the Menhaden Commission. When you mentioned a species, I'm assuming that is which one you were talking about. They are going in this manner; they are trying to approach this as much as possible.

They actually rejected the Lenfest method in favor of coming up with biologically ecological reference points, which will take several years to develop. The stock assessment biologists felt

that would be a better approach; but they are really trying to do – the ramifications of people calling it the most important fish in the sea is what they're saying.

Because you have the large industry that is being developed and the interactions with bait fishery, people using that species as bait, it is important to the ecosystem, it is important to the food chain and everything else; so in that whole system I could see a lot of this being developed. I hope that NMFS is going to be working with those folks along that as well and not just the councils.

MR. LINK: We're well aware of that and interacting with the commissions there and other places. That example is what we're moving along at that level, yes, absolutely.

MR. PUGLIESE: It is good to hear about the opportunity to have flexibility in the way you're looking at the different areas, because one of the things I think that again our region is different from some of the others in terms of how we've embraced the EFH mandates and the extent outside of the regulatory jurisdiction and how important understanding the nearshore/inshore and in the shelf, and actually have extended that footprint – and I'll get into some of that discussion with our coordination with the Landscape Conservation Cooperatives on really looking at the bigger picture ecosystem footprints and connectivity between systems.

It sounds as if there is going to be latitude enough to kind of package these or at least work with the different partners to advance that kind of even bigger picture. There is, as you know, very different commitments on how far you want to extend beyond the core jurisdictional areas.

MR. GEIGER: A theoretical question, Jason; and again I hear what you say about looking at the existing regional management council system as a good delivery mechanism; but as you continue to do some of these more sophisticated analyses and get into more ecosystem-based fisheries management; if you were going to put a predicative hat on, do you ultimately see that this may actually change the whole dynamics and structure of the regional fisheries management councils based upon an ecosystem fisheries management approach?

MR. LINK: It is a fascinating question. I think from where I sit and look at the eight councils, they are probably one of the stronger existing bodies to deliver on-the-ground management advice in any marine sector. There are a few others; the sanctuaries and that process comes to mind.

What they'll look like, how they'll change, I'm not sure I could even predict that let alone if it would be wise for me to try to; but what I see us doing is perhaps an example of what has been done in the North Pacific where they look at that total system-level production. How is the system doing and then they go from there.

We're rapidly trying to come up with those calculations for all the large marine ecosystems, but all the different elements. We're trying to pull together the total catch streams, irrespective of species, and how stable is it? If you look at that system-level emergent property, to go a little theoretical back at you, that theoretical stability actually gives you some latitude then for the dynamics of a population and those changes that happen inter-annually and that broader term emergent stability in the ecosystem level then has regulatory, economic, and business stability

that I think is helpful for planning. I can see something like that coming into play in the council process over time; but how the council is structured to deal with that and so on, I don't know.

MR. PUGLIESE: Just one final comment. Everybody has been provided the draft policy as part of your package. I would recommend if you have any specific comments that you would like to be able to advance to the council, we will be, as part of the report out for the panel, raising this at the council meeting coming up, too.

It would be good to have it in the queue, because your timeframe is pretty quick right after we get done with the meeting. Anything that the council would like to advance can integrate any specific recommendations from panel members, so I would recommend, if you have a chance, to look at that and provide any specific recommendations, please forward those directly on.

MR. GEER: It would be the council that would endorse this; is that what we're looking for?

MR. PUGLIESE: The council will be – yes, that also is being provided as part of their briefing package and that is out for comment. If the council wants to provide any recommendations in this process; that would be the time prior to that deadline. It would be at the council meeting that they would – like I said, it would be under that form, we would discuss it, and then it would be brought to the council for direction. There may be a direction to compile those comments and forward them on to National Marine Fisheries Service.

The good thing I think is hearing some of the flexibility and opportunities to work within the systems and almost go as far as you want. Hopefully, there is also going to be that opportunity to get help on some of these facets that we may be shortfalled on in terms of how we advance modeling of different things that may be in our region.

Even though you're developing guidance, there may be opportunities to help the process along at that stage. It looks as if as the timing with what we're working on in getting the ecosystem plan done and how it is being reviewed at the panel and then through the council on putting together the roadmap; they are all kind of converging very well to be able to make that maximize the likelihood that this is actually going to mean something in our region.

MR. GEER: Jason, out of curiosity, when you said you were in your hotel room and you were looking at bluefish in a model reducing it; what happened when you eliminated it especially from a system like Chesapeake Bay?

MR. LINK: A lot less than you might expect.

MR. GEER: Is there anything else for Jason? Jason, thank you very much, we greatly appreciate you coming in today.

MR. PUGLIESE: We're moving into the next session. We've had some limited time, but again we actually are fairly lucky that we have one of the authors of the first document that is included. This session was going to be looking at South Atlantic Climate Variability in Fisheries. As everybody knows, we are investigating that and moving that forward. We have a Fishery Ecosystem Plan Group that will be the writing team that will be advancing that.

Then we look to the panel and to the advance for policy development. But to set the stage for some of the discussions, as Attachment 10, everybody was provided the latest NOAA/National Marine Fisheries Service Climate Science Strategy, and in this session we are going to touch on that.

Also we're coming off of a Climate Variability and Fisheries Research Workshop. But since Jason is here, I took the liberty as one of the primary authors of the Science Strategy to be able to touch on a presentation we had. It will probably be a little more efficient in terms of identifying. I think this is where we are at the draft stage but it has been finalized. With that, I will just jump to that PDF and we'll move forward.

MR. LINK: That's part of why we build in flexibility is for moments just like this; but we developed the National Climate Science Strategy as a precursor to the EBFM Strategy. When I spoke to the full council last March in Georgia, we kind of covered a bit of both. Some of this will be redundant; I'm going to just blow through that.

The thing I want to mention about the climate science strategy is we were tasked to develop this because we're seeing changes happening rapidly and we've got to get ahead of them. Otherwise, we're going to miss the bus and it is going to impact not only the resources we manage but the people who are dependent on them.

We wanted to try to get ahead of this. There are a lot of pressures facing marine ecosystems; you all know this. Just a couple examples, you're familiar with that; but the shift in distribution – so this is in New England and that is the proper phonetic pronunciation of lobstah. But this is latitude over time; and the shift that we're seeing all around the country of these organisms is amazing and unprecedented beyond anything we've seen in the range of observations.

The other thing is the degree of warming in some parts of the U.S. is highest anywhere in the world; and that is going to change the habitat available to these organisms. These pressures; I'm not going to deal with how we change 350, or whatever it is now, 400 grams of carbon in the atmosphere. That is a different sector.

I'm seeing this impact in the fish that we manage now, so we're trying to get ahead of that and think about how we can handle that. What we developed was just the science strategy. There were a lot of demands for this. We get asked this almost weekly, if not daily. We want to increase the production, deliver, and use of climate-related information to support agency and stakeholder decisions.

We are asking everyone to provide comments on the draft strategy. That is finalized, but now there are regional action plans. Perhaps Pace or others in the region can speak to it, but Bonnie Ponwith and Roy are developing a team to come up with a regional action plan to actually how do you take these national level goals, which I'll get to in a moment, and apply them in this region and what are the priorities that need to be dealt with here?

Climate change and acidification is one we often make sure we emphasize particularly with respect to corals. How much detail do you guys want me to go into on all this? Have you seen this? Okay, the logic behind this is we're seeing climate changes and that is impacting global temperature, precipitation, carbon dioxide levels.

That climate impact – and I'm not talking projections 50 years down the road; I'm talking what we're seeing now – is impacting the physical chemical elements of the ocean. We've seen ocean temperatures rise. We're seeing a loss in sea ice. The Bearing Sea, the High Arctic, the Beaufort Sea has a lot less ice than we've ever seen in a long, long time; going back to fossil records.

We're seeing an increase in sea level in some of our island nations and island territories. We're seeing it shift in freshwater, which has huge ramifications for some of the Salmonids on the west coast. We're seeing an increase in ocean acidification. All these factors are going on in response to this, not only climate change, which has a direction, but the natural variability; and that variability is ramping up and getting higher as well.

Then that trickles through and impacts the biology and we're seeing a shift in the productivity of some species. We're seeing a shift in the timing of different life history events and the survivorship. We're seeing a shift in the species' distribution, the relative abundance, and even the community compositions. Then each one of these kind of has a third dimension; and you can go through some of the specific details of what that looks like.

But then that impacts the socioeconomic considerations of where and how much people fish, the value streams, changes to industries that are not only in the fisheries but that are related to that; for example, gas prices, change of subsistence use and some of the community health. I talked to the guy who developed this slide; what did he mean by community health?

There are a lot of different things, but basically communities that are dependent upon their livelihoods from the ocean I think is the best way to understand that. That is really going to impact a lot of these things, all because we're seeing these impacts and changes. That is getting a lot of attention in a lot of places and we're trying to get the science basis ready to deal with it.

In your case – and I kind of mentioned this in the wiggle earlier – we've actually seen a rise in sea surface temperature in this region along here. We're seeing a rise in sea level. We're seeing a change in the frequency of extreme weather events. I think that season is over so it is safe to say hurricanes now; but we're seeing that.

MR. PUGLIESE: We're coming off the biggest flooding event in Charleston's history; the thousand year flood.

MR. LINK: These thousand year floods are going to be a little more frequent. We're seeing changes in the Gulf Stream position; and that, as I mentioned earlier, has a lot of ramifications for fisheries' recruitment. There is actually some increases in hypoxic conditions. We're seeing acidification and then coral bleaching that is related not only to the acidification but the temperature and other human impacts. This is not projections; this is not, hey, this could happen, this is what we're seeing now.

(Question inaudible)

MR. LINK: I can't answer that in detail. I haven't looked at the measurement of eddy frequency and all that. I just know the variability on a lot of these things is a lot higher. It could very well be, but I don't know that for sure. This is actually projections now, forecast, of some various models downscaling from different IPCC class models.

What you see is a projected change by the end of the century of almost 3 degrees Celsius, which may or may not sound like a lot, but it has humongous impacts to some of these species, particularly some of these species that might be at the southern extent of their range. They are just moving north; and you might be having things moving up from the south.

We're already seeing a lot of subtropical species well up into the New England Region now, so these projections, you can bracket them. There is a lot of uncertainty, but I think it is safe to say that in 100 years we're probably going to be at least 1.5 to 3 degrees Celsius warmer than what we are now.

Some of the effects that we're seeing in this region, shifts in distribution abundance. We're already picking up some of these things. Again, I'm sorry if these are sensitive species or topics for folks, but we're realizing that there is a lot going on. There are a lot of implications. I'll just highlight one with my pointer.

I'm scared to say it out loud, but there are implications for management and jurisdictional issues there. There are concerns about corals and reef systems, not only deep water but otherwise. That is more broadly than just your region, but around the country. We're seeing invasive species and the impacts on the food webs we don't fully understand yet.

We need to get ahead of that, but that is a huge thing that we're concerned about. Then we've already mentioned the oceanography and the recruitment, so just reinforcing some of the discussions that we've had. One of the things that we tend to forget about on ocean acidification is it impacts coral reefs, certainly, but oysters and the shrimp fisheries.

That is something that we're trying to pay attention to. Then coral bleaching, we think the intensity – I think even from when we put this slide duck together a year or so ago; I don't know about the intensity, but I think the frequency has increased at least in the Pacific. I don't know if we've looked at it here, but it is something that we're flagging for attention.

MR. GEER: Is the shrimp in the larval development?

MR. LINK: I don't know the mechanism; but it could be that. It could be the shell deposition is part of it. Then we also think this is going to impact the coastal communities and we want to try to mitigate that or address that. We've already shown you this. This gets back to your question a moment ago, Pace – if you think of a generic natural resource management process or living marine resource management process, we go out and we collect data, we make observations, we do research, model it and come up with what we think might be relationships; then we synthesize all that and do an assessment, either an ecosystem assessment or habitat assessment or stock assessment.

Then from that we get management advice, reference points what have you; and that is trying to do effective resource management. Nationally we have over 450 federal fish species, over 200 mammal and ESA species. There are over 2,000 habitat actions. There are over 200 aquaculture actions in terms of siting and so forth, 100 NEPA actions and 11 LMEs that we're monitoring.

This right here is the slide I use to say we've really got to do ecosystem-based fishery management, because there are all these different factors here. Part of that is incorporating the

climate consideration. Here are our objectives in the science strategy for climate; and we started with the ending point. We need to have reference points available to the councils to make decisions that are informed relative to climate.

To do that, we have to have robust management strategies; to do that we have to have adaptive management processes, and by that we don't mean adaptive processes but adaptive management explorations to plug into the process; robust projections of future conditions, and this is where we work very closely with OAR and several of their earth system models in those projections.

We are lacking some basic information on the mechanisms causing these changes that we just mentioned; and that is some research we need to do. But we're really pushing just apart from that are there some status or trends or early warning indicators we can monitor the ecosystem status reports.

I think of the Southeast Fisheries Science Center just did one last year or two for the Gulf, and there are several of these around the country that we need to start having just as kind of a leading indicator. Here it is, informational; then again it is all based on science infrastructure. We like this idea of starting with the end in mind and having the science basis and then walking up through it, so it is a parallel pyramidal structure and kind of how our thinking is on these types of topics.

It is a little different with respect to climate, because it is really looking at the projections and the mechanisms a lot more than we have. That is where we also bring in a lot of our academic partners to get at some of these types of issues of change and how the different theories and mechanisms are playing out.

What we've done -- This is dated I'm sorry; I didn't get an updated version. We're trying to do this now I think in each region. The eight councils; I think we've done this now for three or four; climate vulnerability analyses, three or four. There was one planned as part of the regional action plan I think in the discussions for this region.

We've got ecosystem status reports in I think four of the six science centers regularly; and I don't know if that matches to the eight councils or eight LMEs if you let me loosely associate those. We're trying to build capacity to conduct climate informed management strategy evaluations. We've actually funded one FTE at each science center around the country to do management strategy evaluations. It is not enough, but it is a start.

This is where we're at now; and I can't speak to the specifics of this region. If you like, I can step out and make a call and come back, but I know that there is a workshop plan for this region to discuss what these regional action plans are going to be to address the needs for this particular council. We're just trying to build capacity for this and really do more process-oriented research.

Then what we want as a routine matter of course is for each council's, say, SSC or each Science Center having this and whatever advice comes out in whatever context; have we looked at these climate issues; have we done that systematically; have we addressed things that we know might affect the dynamics of the stock well beyond what has been within the historical range of the data?

There are a lot of methodologies we've developed and are developing to get ahead of that; but this is where we are. This should now read really 0 to 18 or maybe still 24 months, but this is where we're trying to push since we released this. Here is why we want to do this; some of the benefits, expected results; but probably these last two are the most important from my perspective in interacting with you at the council level.

A lot of the scientists are really interested in things here, and I think there is a natural match and marriage of the different efforts that can come about from this. This is dated. That's finalized and I think that is the last slide. Let me turn it back to you.

MR. PUGLIESE: Thank you, Jason. I think that was good to get into that detail, because I think it does set the stage for really where we're advancing and how we can collaborate into the future and really advance the efforts. It is more of a partnership than anything, and I think that's excellent.

One question I did have for you, and it kind of ties back to one of the comments I made before about a bigger picture and opportunities and all – I'm going to touch on that and kind of an update on our coordination with the Landscape Conservation Cooperative. As an extended connection there, considering we weren't doing a lot or really being able to see a lot being done on the climate discussions in the South Atlantic, we coordinated through that group to make a connection to the USGS Climate Science Centers.

I assume in that bigger picture the coordination and cooperation I would assume would be expanded further; because that is how we had looked at it is they are directly responsible to the Landscape Conservation; so we were kind of taking advantage of the opportunity to be able to look at things such as maybe even distributional changes of habitats that they are doing downscaled models, also, that may inform our EFH information on what we need.

MR. LINK: We're certainly coordinating with the climate offices; I forget the specific names that are in USGS regionally. The one caveat I would say is if there are down-scaled climate forecasts or models that are appropriate, we need to do those once and coordinate and use them across the board and not do them 20 or 30 different ways.

The other caveat is some of what I've seen with those regional climate efforts is they tend to maybe hit the estuaries but kind of stop. You want to make sure that you are bringing in folks from the Science Center to bring that saltier perspective. Other than that, you know all the details as well.

MR. PUGLIESE: That's why I asked it, because we've kind of set the stage for that and our region is unique, because we do have that understanding that we want to look at that bigger picture. The way I look at it is as the implementation, as we look at needs, as those go forward; if those can be done through National Marine Fisheries, fine; if not, some of our partners can foot the bill for some of them.

That is how we're advancing the ecosystem modeling is to be able to do the bigger picture, but it is going to advance how we can move the ecosystem-based management in our area. I don't have a problem with being able to get resources from there to collaboratively work on the issue across the board. That is good to know.

MR. HOOKER: On the previous slide you mentioned some of the things going forward, and Roger just mentioned the ecosystem models. What is the state of like physical oceanographic, like the finite volume models for the southeast? Is that something that NOAA sees as a priority to work on those or where are we?

MR. LINK: We need to have a bake off of RAMs, FECOM, HYCOM and those folks all have competitive juices as well. It is kind of like football. That aside, there is a lot of effort going into that; and that is where a lot of our partnerships are plugging into down the road with AOML for example and then some of the academics as well.

I don't think the Fisheries Service is going to be doing a whole lot of development of those models, but we're certainly going to be using them. One of the discussions we've had in the context of global circulation models is how do we use which model; do we use an ensemble of them, do we use an average? Do we just pick one that is most appropriate or who we like the best or whatever, you know, that kind of thing?

That discussion is ongoing nationally, and I think it is happening regionally. I can't tell you what the progress is in this region unfortunately. I can check into that if you like; but I think that that kind of discussion is one that we're wrestling with. The reason that's important is some of the next generation of the earth system models and the GCMs are getting to this finer and finer resolution, half degree and smaller.

The ability to resolve some of the eddies or some or some of those features is really ramping up; but based on certain parameter assumptions, you could really change the direction and locale. The results then that impact the biology are pretty significant. I think that is why we're being a little more cautious before we jump in and say one model or another. I think what we'll end up with is some form of an ensemble approach, weighting models that were developed in a particular region for that region a little higher than others that are more global. I can elaborate further, but I think that is where.

MR. PUGLIESE: Let me jump in and add – because you missed a quick blurb I did earlier on with coordination with SECOORA, the Ocean Observing Association. That is where I think we really are having a nexus on building the next generation of ecosystem models, but at the same time bringing the partners of the Ocean Observing that are doing a lot of the academics, have been building those model capabilities.

You are right there are a number of different ones, and trying to figure out exactly what – that is the investigated, say what is going to inform or be able to utilize whether it be in the ecosystem models or to determine some type of a recruitment index or something like that. Again we have been kind of building the partnership to be able to help all of us. Hopefully we can advance that even further. I think that is exactly what you're trying to accomplish. I hope that again maybe our experience will help some of that.

DR. CHERUBIN: I just wanted to add something about the modeling in general. How do those models actually get better in different places and different regions for different reasons, right? If you think about FECOM, it is a very good model for estuaries and the transition between coastal estuaries; but if you look at further offshore, it is not as good as HYCOM or ROM, so we may

have a suite of models that we could use based on their best job where they are best at doing it. That is also another way to look at them.

MR. LINK: And we haven't even touched on the model coupling, but that's all.

MR. GEER: Jason, I have a question. These models; are they data heavy? I mean do we have the information we need or are they so data heavy that they are going to be difficult to run?

MR. PUGLIESE: I'm sure he'll follow with me, because we started investigating. That is why we've gone at least at the initial stages with like Ecopath/Ecosim and integration in there, because things like Atlantis are pretty data heavy and some of the newer generation models are far beyond anything we have in our region.

MR. LINK: It depends, is what Roger said, but if you are looking at some of these physical models that we were just talking about, the ocean circulation and so forth, there is a lot more information available than we tend to think about in the fisheries mindset. There is a lot more satellite imagery, there is a lot more thermal – not only basic physics, not only currency, but some of the lower trophic-level information than we tend to think about.

When you get into the fisheries thing, I totally get the data poor and all the details that Roger just mentioned. My understanding is there is a workshop in the next couple days on this. I am actually going to stick around for that and listen, learn and throw a penny or two into the discussion. But the sense I have of this is you build a model; as a modeler you build the model that is appropriate for the issue at hand with the information you have available.

MR. GEER: Are there any other questions or comments for Jason at this time? Thank you very much, Jason, greatly appreciate it; very interesting.

MR. PUGLIESE: We're getting pretty far down. The next thing really was to touch on something that I think Jason was alluding to that one of them has actually happened there; and the agenda was just provided, but a Fisheries Variability and Research Workshop where one of the other coauthors, Roger Griffith, had provided some resources.

We had a team that really pulled together representatives from the Gulf, the South Atlantic and the Caribbean to be able to begin that whole process of discussing research priorities for the overall southeast as well as for the individual subregions. We're literally coming off of that workshop. Marcel Reichert was also involved directly.

MR. GEER: Where was that meeting held, Roger?

MR. PUGLIESE: It was held right here; right in St. Pete. It was like, hey, weren't we here like a couple days ago? This was a workshop that was just held. It was to inform some of the next stages, but it was trying to get the bigger picture to advance; but I think the reality is – and Bonnie was in attendance as well as Roy and a number of other representatives.

We had our Chairman and Vice-Chairman of the council as well as other representatives from the individual states and beyond. We really had a pretty good representation, a broad group to be able to begin these discussions. What has come out is that in response to this entire effort, there

are going to be some follow-up documents that are going to be provided and hopefully sooner than later that will inform – and I made it clear when we were having discussions, it would inform the council's efforts as we moved forward in looking at the Fishery Ecosystem Plan, the climate variability, and fisheries' writing team efforts and how we look at research; the sooner we can get this in the better.

It also is going to inform the implementation plan process that the Region and the Center are going to be involved in, so we've already been requested to participate through the council and partners directly in that process. The wheels are all turning to advance that; and as I said there are also even connections to some of the other writing teams.

We have food web and connectivity that is meeting in the next couple days; but the climate variability and fisheries is going to be meeting in advance of the Ocean Observing Association Board. We are trying to connect some of those because we have players that are involved in building a lot of the oceanographic models in that session, being able to go directly to their other meeting.

This just was held and the information is advancing. What it was really doing, it was putting it in context of having representation, trying to look at what the state of knowledge was for the region and then what observations individuals were seeing literally like on the water with changes and then implications of what that means.

That was all to feed into again the broader steps of what research do we need to do and then what are the priorities for overall in the region. That is where we are. Marcel; that was the big picture. I didn't know if you wanted to add any other comments?

DR. REICHERT: No, I think you covered it.

MR. GEER: Are the transcripts or presentations from that going to be posted anywhere? It looks like it is SECOORA.

MR. PUGLIESE: Yes, it is going to be posted on the SECOORA Site, because SECOORA was one of the supporters and received the resources to be able to run the meeting. They will be posted on SECOORA. What I'll make sure is if we don't get the links, we'll get the materials, because they will be part of the bigger process I think as we go forward.

Plus, I think the materials that are developed after that are going to be important, too. I mean what is good to look at some of the presentations is to see what has been done in some other regions with more detailed information in the northeast where they have plankton surveys and different things with some pretty impressive things.

It really drove some of the discussions on priorities for what we really need to do into the long term. A comment related to this or related to kind of the discussion we had on overall model activity; I think one of the things that ties all the way back to discussions we had earlier on the fishery-independent surveys and other things; there are some vehicles and avenues that I think are going to be rapidly available to refine and bring some of those models down to even finer resolution with the opportunity to integrate things such as all the detailed oceanographic information that is being collected in the existing fishery-independent surveys as the ability to

team some of those down to finer resolution for the historical; but then maybe it would get to a point where they can actually be operational.

That is going to make a big difference to be able to have some of that on-the-water groundtruthing capability with ongoing activities in the region. That is just one piece of probably a lot broader efforts with other partners, with other research vessels that are operating; and that's all I had.

MR. GEER: Does anybody else have any other comments, anything we want to add? All right, we are way ahead of schedule now, folks. I know it is getting late; do you want to take a few minutes break or do you want to just move on and finish up? I hear one press on and I don't hear anybody saying break, so let's press on. I'm all for that.

The last item on our agenda is South Atlantic Landscape Conservation Cooperative Regional Conservation Blueprint Development and Ecosystem Modeling. Roger is going to give you an update on their blueprint activities.

MR. PUGLIESE: It is a somewhat longer presentation, but I'll go through it fairly quickly. I appreciate Rua Mordecai, Science Coordinator; Amy Keister and Hilary Morris for kind of pulling together pieces and parts of a lot of – they are just coming off of the Southeast Association of Fish and Wildlife Agency's Meeting where a lot of these different presentations were done separately and they cobbled them together to kind of get the best picture of where things are with the Conservation Cooperative's Blueprint.

The bottom line is to get it operational. It is the South Atlantic Conservation Blueprint from planning to action. I want to just introduce what the cooperative is again, touch on some of the key areas in developing the indicators, the state of the Atlantic Blueprint and next steps. Since we do have a number of new representatives, it is probably going to be good to be able to catch up on what this effort is.

The Landscape Conservation Cooperative is a forum in which federal and state agencies, nonprofits, businesses, communities and all regional partners work together to develop a shared vision of landscape sustainability and cooperative in its implementation and collaborative in its refinement. The LCC network is extensive. This is a national system and it covers virtually every piece of U.S. territory there is.

There is one I think that is not in it, maybe Hawaii, but it covers virtually everything. It does have some strange context because most of these were connected to the original bird conservation zones, so they had kind of origin in the land-based side of conservation but have evolved to go broader and extend far beyond what those footprints were just used as areas.

Looking at the bigger picture, I had mentioned the Climate Science Centers and the NOAA Rises and the USDA Climate Hub. Those are all connected into and cooperating within this. This is the Steering Committee of the Landscape Conservation Cooperative. We've been involved with the group from literally its inception; and I sit on the Steering Committee as well as the Executive Committee. They have an entire suite from Science Coordinator with Rua Mordecai; Amy Keister is GIS Coordinator, Socioeconomic Adaptation Coordinator; blueprint user support with Hilary Morris. Luis Von is blueprint user support, also.

What they're doing is taking the baseline and actually going out to organizations and providing what this is and all the online capabilities and tools that are being implemented to advance this discussion. A couple research associates with Christine and Brad providing additional support more recent that are going to probably advance some of our connection with the modeling efforts.

What you're seeing is the footprint of the Landscape Conservation Cooperatives literally from the mountains to the end of the EEZ in our region. Now it does in the South Atlantic only capture through here, but there is a direct coordination with the Peninsula of Florida to ultimately connect these so that we have the full complement of activities.

The blueprint essentially is a living spatial plan of priorities and opportunities for shared conservation actions and better facing future change. Planning for the cooperative, not any one organization, this is a unified group or a coordinated group. Adaptation strategy incorporates climate change, urban growth and other future changes.

It is a bigger scope and scale; and so when we look at one level of conservation, this is really getting up to that highest kind of view, the real high view of how all these different systems connect. The blueprint is being used to amplify the impact of existing efforts. It brings landscape perspectives to local actions and competes and allows the competition for conservation dollars.

Anticipate and plan for change; so you're looking at preparing for disasters in public land planning. The adapt to change through conservation action; this is identifying some of the different components such as SARP and some of their inshore flow planning, Fish and Wildlife, Piedmont Conservation Council and American Rivers.

But the blueprint process includes, as mentioned before, indicators, the state of the South Atlantic and the blueprint itself. What it is trying to do is look at indicators that are providing states ecosystem integrity. It is across all the different systems from the marine to inshore. There is work that has to be done on the marine side with all of our partners, but it is in the queue which is the key I think in this.

But also looking at cultural landscapes and maintaining the system; so the state of the South Atlantic was the first snapshot. You have been provided this I think at our last AP meeting. Data-driven assessment of ecosystem condition and provided some kind of initial scoring of the different systems and indicators, which provided this first foundation.

Now, as I think I mentioned earlier, with our involvement directly in here, a lot of our essential fish habitat information was provided to set the foundation; but then it went far beyond that to look at building corridors and connectivity of systems, so it really was advancing that perspective; not just on the land and connection of the land, but also even in the ocean on how the connectivity works; so along the shelf and inshore to offshore shelf system.

The idea is to look at those indicators, the integrity, and then begin to look at priorities and then connectivity and be able to do – and some of the tools that are developing in this system are pretty impressive. What we need to do is have – you saw our system operational; and what we

really want to be able to do is have those systems between the marine and the LCCs operate fairly closely together and be able to take advantage of some of the new technology.

What you had was building the indicators, looking at priorities and then looking at areas that you could have shared action. Ultimately, it is providing the collective impact so you have multiple organizations or opportunities to advance conservation, which may not seem to be apparently connected, but conservation for nearshore land-based activities may actually have estuarine implications. It really is advancing some of the capabilities.

Now some of the technology, the conservation planning atlas is using a database system. The viewers that are fairly easy, but the interesting side of that is the way some of these systems are you can zero down through the entire – or work all the way down through to see what the rationale for building that entire specific layer, and it goes all the way down to the discussions during sessions that created the thing. It's a very different type of a system than other ones that I've seen.

The other thing that was very important with this was that there is what they call a lean startup method. It was key, because what it did is it got it off the ground. It didn't get mired and taking three years to get this advanced. The idea was to get this moving, get the best you can at this point and refine as you go.

I think that has been a very powerful thing and very supportive, because the commitment of the group itself to make it something real other than just a document or a function that sits there is huge in our system. To look at the content, as I mentioned, some of the next steps of refining this are going to be improvements to the indicators, updating the connectivity information, and action indicator links to build new chart graph features and provide more intuitive design.

The blueprint user team is split across all the different portions, so it really is trying to address the entire broader system. We have a conservation design team. Then some of the immediate applications or anticipated ones are, for example, the protected land conservation and grant funding. South Carolina DNR was immediately using some of this prioritization to look at the grand funding and land conservation.

The efforts to look at the Cape Fear River Watershed and prioritizing fish and wildlife habitat within that basin by the National Fish and Wildlife Foundation, using Nature Serve, the Cape Fear River Partnership, as well as the National Heritage Program; again through Fish and Wildlife informing acquisition boundaries and prioritization of land protection, and then we are advancing some of the activities to try to embed this into our Fishery Ecosystem Plan.

You may recognize me, but that is Wilson at a younger time; but this hopefully will ultimately help with being able to look at how that fits into our regulatory and may change it. The other one has a lot of effort that is connected to this is the Southeast Conservation Adaptation Strategy that the states throughout this entire area have been implementing and working to effectively bring that information system together.

The bottom line is that we can further expand the efforts that is online. There are opportunities to connect in here, to go online and be able to interact. What I'll do is make sure that any of the newer things that are happening get provided to the entire panel and we advance that. I

appreciate again the LCC staff for providing that; but it is a vision into the future that really integrates everything we've been talking about that helps advance it.

Like I said, if there are opportunities to provide resources to advance that that are meeting all of our needs, I think that has been a productive one. The ecosystem modeling that we're going into the next stage is going to start fairly soon of building the next generation of Ecopath/Ecosim; investigate the oceanographic model integration of existing models being developed through partners in the region through North Carolina State and other partners.

Then investigate even the estuarine modeling, getting to that issue of coupling, starting to investigate those and how that may ultimately be coupling so it is getting – when you use that building an ecosystem-modeling suite; that is some of the exact terminology we talked about, because it does exactly the same thing.

There is really that opportunity. This is being funded so that the oceanographic side, the marine and estuarine side can be more effectively joined with the discussions on the land-based side of the conservation blueprint and we can collaboratively work further. As I mentioned, one of the other things that I'm looking forward to is the coordination with ESRI at a higher level to be able to advance through potentially ArcGSI online, some of this is a more effective way to distribute, connect and advance the process. Any questions?

MR. WILBER: Just for the record; folks in my group have been participating in a lot of the subcommittees that the LCC has used for citing criteria and testing out some of the products that have come out. We've been very enthusiastically but still with a bit of caution using their products and just to give you some examples of how we've been using them.

Within the South Atlantic side of the Southeast Region of NOAA Fisheries, we receive about 1,000 EFH consultations a year. We actually only work on about 400 of them. There are about 500 to 600 consultations that we don't do; we just send a no-staffing letter. In order for us to accurately do that triage system, we need some assessments of which places are important and which places are not important. That is a very big driver in our triage system.

We use the Conservation Blueprint from the South Atlantic LCC to help guide that triage system and it has been very useful to us. Another place where the blueprint has been very useful to us is in the actual implementation of our hydropower program. We have about 500 or so FERC dams and dams that are instrumental to how FERC regulates those FERC dams across the Southeast.

In order to prioritize how we address those, we need to identify focal watersheds where there is significant conservation potential and where our authorities under the Federal Power Act intermesh really well with that conservation potential. That has been a big value to us as well. Roger highlighted the Cape Fear River; and we put a lot of our hydropower efforts in the last couple years into the Cape Fear River and expanded a little bit beyond hydropower, per se, to actually address conservation, locking, and establishment of rock arch fish ramps at the locking dams on that river.

A lot of that has been driven by the information that has come out of the LCC process. It has been really useful to us as a tool to kind of guide how we triage as we have to deal each year with more and more consultations. Having fewer and fewer staff to actually do things; we really

need to focus on places where we get the most bang for our buck in terms of manpower, and this has been really good for that.

Now on the cautious note, when you step back and you look at the areas that the Conservation Blueprint identifies as not important; there are some areas that actually kind of stick out; one of which is the Broad River Basin in South Carolina. You ask anybody who works on freshwater fisheries in South Carolina; they are all going to point to the Broad River Basin as one of the most important sub basins within the state; but it doesn't get highlighted in the Conservation Blueprint.

Exactly why it doesn't get highlighted had something to do with the criteria that are being used and the data that are being fed to actually drive those criteria. We've been in discussion with the South Atlantic LCC to try and figure out have we all been duped in South Carolina? Is the Broad River really not all that important or is there some key bit of data that is missing out there?

The other point to note, too, from a cautious perspective is that the Conservation Blueprint largely, basically boils down to the bigger the area the better. By a bigger area than the better, it basically does not identify any urban systems as conservation priorities. If you're trying to find the best place for a park or the best place to try and maintain some bit of marsh ecosystem inside an urban landscape like Charleston; it is not going to show up in this.

You have to understand sort of those weaknesses in the system, too, that are all kind of scale-related, as Brian just noted. But despite those weaknesses, which I think are all addressable as they get to Version 3 and so on of the blueprint; even at the very Draft Version 1, we found it very useful to explain our triage system to other people and why we were making the choices we made about where to work.

MR. HOOKER: I guess along those same lines, I was interested in understanding how it is used and like who owns it, so to speak. It means ultimately Fish and Wildlife Service I guess is the primary pusher for this, correct; but everybody is an equal partner.

MR. PUGLIESE: Yes; it really is under the umbrella of the LCC. The way this system has evolved is Fish and Wildlife elevated it as well as USGS; but if you look at that Steering Committee, a lot of those players are providing input, so EPA, different ones are either providing funds for maintaining it; but there is aligning them for the LCC. In reality, yes, but it still is the collaborative with more individuals even providing information. The information right now is housed under the LCC systems.

MR. HOOKER: You do feel like it adds some additional areas that may not be present from current hard-bottom maps or other areas. Is it more helpful to you in the inshore, closer to shore, in these inshore/offshore areas than it is in the offshore areas where you have access to probably all the data that you need to prioritize on the offshore? I'm just trying to understand how it could be best used.

MR. WILBER: Right now it is really valuable on the non-tidal freshwater systems, which are important to us in the execution of our hydropower program. It is still valuable and helpful in the tidal inshore systems. It becomes a little bit less valuable once you get outside the Barrier

Islands and into the marine environment, per se; but they are struggling with what are the best criteria for prioritizing those areas. We are on the teams that are trying to help them do that.

Now as far as what is the implication to us as a NOAA Habitat Program to have that pattern of strengths and weaknesses; it is really not that damaging to us as a NOAA Habitat Program; because if you look at a map of where all of our EFH and Fish and Wildlife coordination and consultations are, 99 percent of them are within a mile of the shore and shoreward.

We're not out in the area where the South Atlantic LCC currently is the weakest, but we're still working with them to improve their strengths out there. We work together all the time on wind projects. If there was an obvious tie to the wind projects, I think we would have noticed it at this point; but I think it is still to come.

MR. PUGLIESE: The main thing is stay tuned. I appreciate all the comments from Pace, because he did put it in a very good context, I think. It has advanced way far – a lot of applicability inside. As it moves into the marine, we're really struggling with how to advance it further.

But the fact that we've integrated a lot of the foundational information as baseline, the opportunity to get the refined information integrated and then expand, as you said, how those criteria that are driving those are going to be critical to advance it even beyond our original EFH designations.

As you saw, what it also got into is this issues of corridors and different things where that has not been investigated in the past, and this is going to open that door beyond some previous. I think some of those new tools I think and additional discussions are going to advance and hopefully answer some of these areas.

Some of the points you made, like on the urban areas; those were actually strategically pulled out just because the focus was on the natural systems with the intent of coming back and figuring out exactly how to do that into the future. I think, as you said, as we move down those roads, they can be addressed and advanced into the system.

The last one was on the support ecosystem modeling; and I think I've raised that a number of different times about where we are and the next stages. As Jason said, we have this coming up as a food web and connectivity writing team, but there are key players and members of that that are directly involved in the next generation of these ecosystem models that are going to inform that process and advance the level in our region.

I think that statement before about moving toward an ecosystem modeling suite that looks at everything from the ecosystem model to the oceanographic to estuarine and the connectivity of these different systems, and even we're going beyond that of some of the bigger type of models to go outside the bounds on whether it be the ASIS model, some of the things that Jerry Alt and other participants have worked on in the past; so you really begin to investigate bigger picture as well as fine resolution. I think that is to come.

MR. GEER: Okay, is there anything else on this? Marcel.

DR. REICHERT: Someone was asking about the presentations from the Climate Workshop; and on the Attachment 11, on the bottom there is the website, and actually Laura gave a presentation there and there are links to the PDFs of those presentations and to the documentation, so there is a lot of information in there. It is SECOORA.org\fishclimateworkshop, just as an FYI.

MR. GEER: Okay, we'll get that off to everybody. All right, is there anything else? Just summarizing some of the things we need to do from the meeting; the Artificial Reef Policy Statement, I need the state leads to give us a name of somebody who can help on that. I've already got one I believe from Anne. We probably only need about six or seven people maximum on that.

If you are the state lead and you haven't given me a name that can participate in that; please let me know. If there is anyone else who wants to participate in it, please let me know.. The Energy Policy, final edits to Roger by the 27th, no later. He is going to resend it out as soon as possible.

MR. PUGLIESE: The plan is to complete that and distribute it back out to the group with the intent of then whatever the final version is, is going to be included and provided to the council in advance of the committee meeting.

MR. GEER: Get those to him as soon as possible. The NMFS Ecosystem-Based Fisheries Management Policy, I guess if anybody has comments, I would say the same day, the 27th. Get them to Roger by the 27th, because they want to have those comments for the council meeting.

MR. PUGLIESE: Yes; and if we can integrate them into the panel report, I think a lot of this I am hoping we can just integrate into the one. We'll have the policy; we'll have any other recommendations. That is kind of how we proceed, because it will be kind of bundled under that same discussion.

MR. GEER: If your individual state or organization wants to provide comments; that is December 16th. The final thing, when we broke out yesterday into state groups, some did the mapping and some did that; the state priorities for fishing and non-fishing activities, we did that last meeting but we need to summarize if there are any changes to that. The state leads, if they can get that to me and I'll collate it.

The same thing with the observations and priorities for climate impact on habitat and fisheries, I kind of have yours already because I did them together. North Carolina/South Carolina, if you can get me that information; and then the state activities and opportunities for advancement of citizen science, those three things. We don't need those before the council meeting, do we?

MR. PUGLIESE: Not really.

MR. GEER: I'll put a date on it, December 4th. That is like a Friday, if you can get it to me by then. If I don't have it by then, I'll send out a reminder also. It is really short and sweet.

MS. WENDT: Pat, would you mind sending out an e-mail with all these action items and dates?

MR. GEER: I sure will. Roger sent out that NOAA climatic questionnaire. Do you want us to do anything with that?

MR. PUGLIESE: What I said was that if anybody has any specific comments you would like to provide, please provide those directly to me, because we are internally going to be responding and we have a deadline of like the 12th. We're going to have something coming formally out of the council office as the council position going to the GAO for their coalescing of all councils.

MR. GEER: I will go ahead and collate that and send it as an e-mail to the state leads.

MR. HOOKER: Going back quickly to the artificial reef policy; just putting it out there, I can be a resource if you do want to touch upon decommissioned structures. If that is going to be part of the policy, I am happy to help out with that.

MR. GEER: Anything else? Do I have a motion to adjourn? We are done. Do you have anything else to say?

MR. PUGLIESE: I said enough, I think.

MR. GEER: All right, folks, safe travels.

Certified By: _____ Date: _____

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