UNITED STATES DEPARTMENT OF COMMERCE

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

MARINE FISHERIES ADVISORY COMMITTEE MEETING

Portland, Oregon

Tuesday, April 26, 2016

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P R O C E E D I N G S

(8:23 a.m.)

MS. MORRIS: Is everybody ready to get started? Good morning, everyone. Just a quick overview of our agenda for today. We are going to start with our regular budget overview with Paul, and then have a science update from John Stein. He is going to touch on climate science strategy and the regional action plans, as well as ecosystem-based fisheries management.

We will start on a series of presentations and discussions about resilience, about our resilience tasks. The first one is about fishing community resilience. We will have two presenters, Steve Freese and Sarah Towne. We will have our morning break, and then we will have a resilience presentation about harmful algal blooms, again by John Stein.

We will take some public comment and then we will have lunch, a lunch break. In the afternoon, we get back to resilience with a presentation from Katherine Cheney about targeted

communications strategies.

After that, we will break into work groups, the ad hoc work groups. Two of them will meet concurrently, Communications and Management Approaches will meet at 2:15. You will have to choose between them. Social and Economic Community Impacts will meet at 3:15.

Promptly at 4:00, we all need to be out at the curb if we are going to Pacific Seafoods and Liz's dinner. That will be at 4:00. Heidi will be collecting $15. Is that right?

MS. LOVETT: I will find out more information.

MS. MORRIS: Forget that I mentioned anything about $15. (Laughter) That's the day ahead of us. Are there any sort of logistical notices that we need to make here at the beginning of the day? Yes, Liz?

MS. HAMILTON: A couple of things. I live on a small farm, so it is dirty and I have dogs. If you get a chance to change into something comfortable, that's great. It's not

warm out but we will be using the deck for seating as well as inside the house, so --

MS. MORRIS: Bundle up.

MS. HAMILTON: Bundle up. I will send out instructions to Heidi for those who might be driving themselves.

MS. MORRIS: Thank you, Liz. If there is nothing, else, Paul Doremus, please tell us about the budget outlook.

DR. DOREMUS: I guess the President always starts off the State of the Union is good. (Laughter) I will try to get to that.

MS. SOBECK: The State of the Union could be worse.

DR. DOREMUS: There you go. (Laughter) We have minutes. We have a lot of information here. We often will do slides that have a lot of content on them, kind of a reference, so you can go look at them, with folks on the committee -- we have the ability to go back and look at some of this content. There we go.

Process notes, the budget process in

D.C., it is complex, and very often, it is easy to lose the bubble on where we are. We are always dealing with three budget years at once. I want to just give you some refresh on that, and then really focus on looking through in 2016 and where we are with the President's budget in 2017. We just had the Senate report out, and I will comment on where we are with that.

This is the long cycle in the Federal budget starting with the formulation, step one, right here, at the outset of things, at 1:00, I guess you would say. We go through a process of vetting our budget with the Department -- with NOAA first and then the Department, and then it goes through an administration process and ends up with the PB.

A lot of folks, we have this comment here, very often we get pressure, why did we make decisions on X in the PB, and there are a lot of steps along the way. We influence but we do not control.

The Pres Bud represents the

Administration's viewpoint. We inform it. We don't always control it. Then it goes through, swinging along here, a release. The other problem here is that this is all pre-decisional, on the right side of the screen, so we cannot talk about what's in the President's budget or might be in the President's budget until it is in the President's budget, and then we are out there talking with Congress, which we are doing right now with fiscal year 2017, and we are right here in this May to September territory.

The Senate just commented on 2017. I will tell you where they came out. The House has not acted on that yet. Then it will go through an actual appropriation. You think the appropriation is it, right? You see what is in the bill, that is what comes to us. No, not entirely.

That is the purpose of this slide. We go through all this budget formulation, hearings, markup, and you get an appropriation, right here in the middle, but then it has to go through several additional steps before we actually have

resources to expend.

I was just talking with Dave Donaldson, and he's wondering why on earth some of the grant money that we do just about every year for Gulf spend and other types of data collection efforts hasn't come through. Well, it takes sometimes months to get an apportionment. The Administration and Congress have to agree on spend plans. They might adjust them. They might adjust them in other parts of NOAA that could subsequently have an impact on us.

Even after we get the authority to spend, which is what apportionment basically does, there can be rescissions and other kinds of costs taken out of it that can influence the bottom line. We have scholarship funds, de-obligation of prior year funds, management and administration, common services.

When folks look at appropriation and then they see what actually comes out, this difference, they don't know why, it is often because of all these adjustments.

A complicated process, a long way to get to actual resources to expend. I mentioned we have three years at any point in time, so we are executing 2016. I will give you a few highlights. We got some good new things funded 2016. We also are here in the middle with fiscal year 2017 dealing with the congressional process. If all goes well, we will be executing it the beginning of the fiscal year. That is theory more than reality of late.

We actually are in the very early processes now of formulating the fiscal year 2018 budget. We have been through all of the NOAA internal process. There has been discussions with NOAA leadership. They have made decisions about what they would like to see in 2018, but 2018 is all predicated on the President's budget request for 2017, which is highly unlikely to get funded as requested. There is going to be a whole revisiting of 2018. As all of you know, 2018 is going to be the first budget executed by the next Administration, so it is highly likely that will

get changed.

There are two options for the next Administration when they come in and pick up in fiscal year 2018. Both of these have been done in prior transitions. They can hold it and extend the release of the President's budget until May, and completely redo the whole thing in a crash program. That is one path.

The other path is they could do either a continuing resolution, just kind of a steady state budget, or fund some pieces of the prior Administration, but rarely does that happen in a two-term Administration, even if it is same party. It is always a very different regime, new priorities, things need to change, the budget needs to reflect that.

I expect we would see either a CR until a full new Administration budget in 2019 or we would see a completely redrawn 2018 in the first few months of the next Administration.

Here we are moving from 2015-2016 to 2017. You can see growth here. We are still

recovering from the very substantial drop-off, nearly 13 percent, from fiscal year 2010 to fiscal year 2013. Fiscal year 2014 brought us back up in terms of our core programs, about 3.5 percent. Fiscal year 2015 added another 1.5 percent, I think, and the 2016 proposal, we were very fortunate to get a 3.1 increase in what we call our core programs. It is the programmatic funding, if you will. I will get into a little bit of the content there.

The President's budget proposes -- it is a very, very strong budget for us, it recognizes a lot of important shortfalls, and that proposes about a 7 percent increase in our core funding request. Again, I don't expect to get that. In 2016, that number is pushed out here a little bit to a total of 971 with this 3.1 percent increase.

Here are the program increases. I just want to highlight a few in the interest of time that are some of the larger pieces here, and also some things that were different than what was requested in the President's budget.

Starting off, and this is going to be a little bit of a theme, we have for some time been working with the Administration to in effect diversify our protected resources recovery efforts. We put an enormous amount of money into salmon, and there has been a lot of interest in putting greater resources out to states, to tribal authorities, for non-salmon ESA related but not exclusively ESA necessarily, species recovery grants.

This is a grant program. It has been requested at very significant levels in the President's budget but was only funded to the tune of $1 million. In the Pres Bud for 2016, the request level was for $17 million, the Administration -- this is the second year now, 2015-2016, and 2017 is the third year -- has requested very, very substantial increases here, and there has been some acknowledgement, but at a small level. $1 million there on what was a substantial ask.

The big one here programmatically is the

$7 million line for electronic monitoring and reporting. There has been a lot of discussion here. We are going to hear later from the Pacific States Commission, with Randy reporting out on their work. We are implementing, have set up regional EM/ER plans. This gives us for the first time programmatic money to get behind that. We have been putting it together from different resources. Most welcome here. We are committed to accelerating, pushing hard on EM/ER, and that is going to help us a lot.

Also, we have an increase of $5 million that was not requested, and this is actually 5 of 10. There was additional resources put in the OAR budget for Sea Grant, to focus on the same thing. There is a lot of angst in the Gulf over red snapper. Dave Donaldson can tell you everything you ever want to know about red snapper and that angst.

It is a big issue that they are putting some big money against. They want us to get new types of technologies out there for counting fish

on reef structures as well as artificial structures. There is at least a few out there who think we are under counting for those reasons.

There is a lot of skepticism about our stock assessment, our red snapper stock assessment. There is a possibility here with this type of money of doing a complete, almost separate census, a tagging study, that would allow you to come up with the total population assessment. That is what some folks are recommending that we do.

That is how that money might get spent. We are working that out with Congress right now. That has been the recommendation there, do a big tagging study, fund a bunch of technology, maybe some citizen science. There is a lot of resources there, and we have to make good use of it.

Aquaculture here is a small story, but a bigger one coming forward in 2017. I will get that to you in a minute. We have been asking lastly on the 2016 front for money to get behind all of the activities that the President has been

advancing through the task force for combatting illegal, unreported and unregulated fishing and seafood fraud. This is part of a multi-year effort to build those competencies. That was funded at about the request level of an additional $3 million.

Those are some of the bigger pieces in 2016. Overall, a very substantial and better budget than many of us expected. Two things to note, species recovery grants. You will see that again in 2017. A big thing not here that we requested again in 2017, we are extremely concerned about inadequate capacity to do what we call core consultations, Section 7 consultations, essential fish habitat consultations.

We had requested nearly $19 million. We have money flowing into the Gulf. We already have a huge backlog and an increasing backlog in processing permitting requests and things of that nature. We have streamlined processes. We are ranking and structuring things based on conservation impact.

We can't keep up. It is literally a processing capacity, so many people can only do so much in so many hours a day. With RESTORE coming through and with the corals listing, we have demand there that we can't meet. We had asked for $19 million for staff to do that, it didn't come through, and we are very concerned about it. That's a marker there.

I did want to note, we meet every year and a half or so, at least we started this fairly recently, we have been trying to improve our strategic connection, our partnership with the states. This is a slide that we showed at our state directors' meeting just a couple of months ago.

It shows you our grant levels against our total budget. There is some weird movement. The reason you have this outlier here is because of disaster funding for Ike, Katrina, Rita, and the Red Tide in Maine. There are some oddball things here. The main thing is our grant money tends to go in the same general direction as our

total budget. It is a substantial portion of our budget.

We put out about 15 percent of our budget in these types of grants. The grants overall to states are about half of our total granting. It is a real key strategic relationship. We are trying to improve funding of in particular data collection efforts run by the states, and we expect to continue to press in that territory.

That gives you a little bit of a sense of that function. Here for your reference, I am not going to spend time, just some areas where we have extremely important grant components of our programmatic activities.

EM/ER. We work with the request of Congress, and we are extremely pleased to do this with National Fish and Wildlife Foundation, they bring match to the table. We get to augment our resource base going into EM/ER. That is a really important relationship, our coastal resiliency grants are as well.

A lot of collaboration there with external entities, and our Saltonstall-Kennedy grants have been the one in recent years very good solid note, grant money going out to the regions in substantial measures since fiscal year 2013. It had been zero in 2011 and 2012.

That has kind of returned to a good grant program that allows us to work with the councils and commissions on shaping priorities and getting them into the regions to fund important programmatic efforts. We can get into that in detail at another time.

Again, in the interest of time, I want to quickly hit 2017. First noting the dark bar here, that is Fisheries. We are looking at the total NOAA budget here of nearly $6 billion. This is small in Federal agency terms. Huge by any other measure. That is a lot to work with.

We are about just under 17 percent of the total budget. The main thing I want to point out here is when you look at that, this is roughly -- the first two lines are roughly dry side, the

rest is roughly wet side. These are satellites, they are very expensive, we are in a major recapitalization campaign. The Weather Service, labor intensive, tech intensive.

We rely on lots of other pieces here. We collaborate with the National Ocean Service, next one down, particularly on resiliency grants and things of that nature, place-based work. We rely very heavily on OAR, NOAA's research division for climate work, and we collaborate very closely with them on marine impacts of climate change, a concern everywhere.

OMAO funds vessels, observation platforms, big issue there, trying to get recapitalization, and even in mission support, we need HR functions, we need acquisition and grant functions, et cetera. Lots of constraints coming at us from there operationally.

If you look at the fish budget, you have to look at the whole thing. There is a lot of interdependencies. We need to pay attention to those things, too.

This is an overview of the 2017 ask. I am going to get into the major changes in a sec. I mostly wanted to point out here that this is one of the first times we have been asking for such a substantial increase in protected resources. That has been flat or declining for years. We have a major new strategy now focusing on recovery of protected resources, Species in the Spotlight is a component of that. That is a substantial change.

Overall, this is how things break down in terms of our major subactivities, protected resources, fishery science and management, enforcement, habitat, and the subtotal here. You can see the top line numbers.

Again, in the interest of time, let me just show you where the programmatic requests are in 2017. They fall into these four categories. We have been trying to get NOAA, the Department, the rest of the world to think about our budget in these major categories, really these three.

We are talking about core capacity, advancing science, and then some strategic

programmatic investments that are small and highly focused. These are the three areas. This consolidated funding has to do with a multi- line issue with NOS, which I will get to in a second.

On the core capacity side, I wanted to go along here very quickly. Here again is that core Section 7 and EFH work coming back again at the system for a $20 million ask. In 2017, as many of you know, the Senate just reported out from their Approps Subcommittee, they funded the combination of these. They really funded, if I recall correctly, ESA, Section 7 consultations at 2.7, a fraction of the ask, and didn't specifically fund EFH consultations, way below what we need. We are very concerned about that, grateful for the increase. We got nothing in 2016. That is not enough. We are going to worry about that.

Pacific salmon was flat, requested 2.3 increase. Species recovery grant, again, we requested 17, got 1, we are back asking for the other 16. It was funded again at another 1, so we

are up 2 over the last two fiscal years. Again, something is good but not at the scale we had hoped.

This is the key thing of that core capacity, we have eroding physical infrastructure assets around the country, all of our laboratories. We have some that are recapitalized in the Pacific and Southwest, and fairly recently in Alaska. Elsewhere, we have very, very aged laboratories, overcrowded, increasing costs, don't support the type of research we need today.

We have sitting out in Mukilteo, Washington, north of Seattle, a lab that is sitting on pilings that are collapsing. It is now actually on jacks. We had to evacuate the lab. A gentleman ran under there, a structural engineer was looking around at our pilings, and his pen knife went straight through. He said you have been sitting on fossil wood, get everybody out. We did.

Now it is sitting on jacks, literally, they crank it around once a month to level the

building out. We have 5 years and we have to move out. It is a really critical lab for a lot of work. John can tell you in detail. We have very, very clear, clean, steady water there for ocean acidification work. We have historically done a lot of ecotoxicology out of here.

Key lab. We have 4.6 to start on it. In 2018, we hope to get the request in the bill. If we could do that, that would be about a $28 million ask. Big thing there. Larger ones to come. Woods Hole and Miami are the next two on the list as far as greatest in need of recapitalization.

We have a bunch of areas here, fishery science and management. Our ecosystem-based solutions for fisheries management, very important long-term work. Unfortunately, not funded in the Senate version.

Aquaculture, the good news story in 2017, that was actually funded, I should say proposed to be funded by the Senate, we need House conference, but a good marker there on

aquaculture. Some folks here had a big hand in making the case for this at $3 million instead of 1.5. There is some focus there on new techniques, off bottom shellfish, and things like that.

The environmental and ecosystem resilience was a proposal by the Administration to kind of forward fund disaster grants. That was not funded by the Senate. We don't expect it will be by the House either.

Observers and training, not funded. Our catch share program was. This continued request for DBO, distributive biological observatory in the Arctic, I don't believe was advanced.

On the strategic side, a little bit of our request was noted for additional work on the IUU side, the piece that got funded was to utilize this new international trade data system for the purposes of IUU and seafood fraud. It was just a small component there.

This consolidated funding, we have been back and forth with the Administration and Congress over where is the center of gravity for

coastal resilience grants. There is a lot of commentary between what NOS does, generally oriented a little bit more towards community resilience built infrastructure. We are more oriented towards kind of ecosystem productivity with a fish and PR orientation. Those two can be done well and should be done in conjunction with each other.

That got moved to NOS, and the Senate did accept that move, so you will see, that looks like a negative for us, but it is a positive in the NOS budget and a net good thing. As always, we are happy to work with NOS, do anyway, and Congress has kind of gone along with the proposal there.

We continue, as I always say and have said to you in prior discussions like this, lots of puts and takes. We have a Senate mark on 2017. We don't know where the House is going to come out, and I don't expect actually to get a 2017 appropriation. The general view is we will likely get a continuing resolution for 2017.

Most likely what we will see is a continuation of 2016 levels. Where the Senate came out, very important, where you begin is where you left off. That is starting some important conversations. We are pleased to see many aspects of the Senate mark for 2017, but I think we are going to see a CR all the way through and into 2018 until the next Congress is seated, is my personal view. It could change.

We ought to keep focused -- this is what we tell our staff, it is what we tell everybody -- on current year execution of what we have. That is what all of you are here to advise us on, partly direction, but also maximum use of our existing resources.

We have been emphasizing strategic partnerships, and you all are in a critical position to advise us on that. We look forward to further direction and advice from you.

I will leave it at that, trying to move quickly. We are happy to take some questions. I will turn it back to the Chair.

MS. MORRIS: Questions and comments? Mike?

MR. OKONIEWSKI: Capital investments such as satellites or big projects, is that separate from this?

DR. DOREMUS: Yes. There are some different parts of the budget. Buildings show up in mission support under the Chief Administrative Officer for NOAA, and satellites show up under --

MR. OKONIEWSKI: I know how we do it in the private sector, but do you depreciate that or is there a need to because it is not a profit and loss, or is that even an issue for you, or accounting issue?

DR. DOREMUS: It is. We have used conventional accounting methods for looking at the life cycle costs, which do involve basically an amortization schedule, but we don't unfortunately handle capital investments and recapitalization requirements anywhere like is done in the private sector and in other Federal agencies.

We have been asking for a line in our

budget that we could use for continued repair, maintenance, and recapitalization of our buildings over time. What is not real helpful is to have these spikes with big recapitalization requests. What you end up with is Mukilteo after Mukilteo, so the last building we built, the Southwest Fishery Science Center, literally was on an eroding cliff. We had to evacuate parts of that building. You could stand on the corner and look straight down 200 feet to the beach.

It wasn't until that and ARRA money, Recovery Act money, that we actually were able to get the funds to rebuild that lab. Mukilteo, 5 years, we're out. We have at least 4.6. It is the traditional crisis driven decision making on big things, and we would like to have a recapitalization line that would allow us to maintain more of a business like approach to managing our plants and equipment. Unfortunately, we don't have that.

MS. MORRIS: Peter?

MR. MOORE: On your budget for 2017,

they zeroed out the ecosystem-based fisheries management work?

DR. DOREMUS: Yes, ecosystem-based solutions for fisheries management.

MR. MOORE: How is that going to work for all the councils that are sort of moving in that direction? I guess I was just curious what the rationale would be from the Senate for that. It is basically a priority for all the councils to move in that direction.

DR. DOREMUS: This in particular -- there are a lot of different dimensions of ecosystem-based solutions for fisheries management, this one was looking in particular at the proposal focusing on kind of connecting coastal habitat conditions to offshore conditions.

We have been asking for a variety of ways for getting new funding for process studies that are ecosystem oriented.

The bottom line answer is we are going to have to do that with base resources. Right now and for the last several years, that is all we had

to go on. We did get in 2016 some climate money in OAR that is focusing on marine impacts, and we are collaborating very closely with them, so that was good, and we will continue to do that.

For the most part, our science guys, John, Richard, all of them are going to have to figure out how to do that within base.

MR. MOORE: At least in my region, it is a big push for the councils, and within the Fisheries Science Center, and I kind of assumed -- well, we are going to hear about it today, right?

DR. DOREMUS: Yes.

MR. MOORE: Thanks.

MS. MORRIS: Peter Shelley?

MR. SHELLEY: Without going into detail, the Saltonstall-Kennedy funds are always a big issue, it is great to see you got the grant program back up and running. Can you briefly just say at a high level how much money comes into that program and how it is allocated now?

DR. DOREMUS: It varies. It is based on tax receipts and how Congress decides to channel

them. It is under the promote and development account. Congress channels them in two places.

The bulk of those tax receipts actually offset our operations research facilities funding, so the largest, on the order of $130 million of those tax receipts basically offsets our core funding, and then they decide in any given year how much of those tax receipts they want to put into the Saltonstall-Kennedy portion of the promote and development piece. This year, it is $10 million.

MR. RHEAULT: Who is "they?"

DR. DOREMUS: Congress, the Appropriation Committees. You will see it in the Administration's budget, but what is there is basically an estimate of what last year's would be in the coming year. It is really up to the Appropriation Committees. It always has been. They have gone anywhere from zero, as they did in 2011 and 2012, they put it all into ORF offset, to the programs we have seen in recent years, which are some of our healthiest SK numbers that we have

seen.

By the way, I do like to emphasize this. In the interest of everybody knowing, by law, we have to take 60 percent of that money and put it out into the regions, and we can use 40 percent of the SK money for internal purposes. In the past, we have done that.

I could take 40 percent -- we could take 40 percent and fund some of these science activities. Congress wants and we have obliged, that money to go out into the regions. We have put 95 to 98 percent out to the regions, and will continue to do that. We take a little bit of money for the cost of managing the program, but that's it.

We also took a little bit of money and put it on state data collection efforts in the last couple of years, which is also going out, and in the spirit of SK, it fits all the requirements, and that is how we have been able to address some of the shortfalls that the states have experienced with flat budgets, rising costs, and these really

important data collection efforts that we rely on and do collaboratively. We have used SK for a little bit of that, but it is really driven by Congress. We got $10 million this year. I would expect something close to that in 2017, but we don't know.

MR. RHEAULT: It's a good topic just for continuing communications because there are a lot of perceptions about it that stick.

DR. DOREMUS: Yes. I would be happy to work with you. We have been working very closely with the councils and commissions using them to help set priorities. The priorities vary by region, as they need to, based on different research priorities. We have been using them to help inform the right people for the constituent reviews, to look at balance.

We have come a long way with that, and I think it is reflecting real needs and is a good grant program that we hope to be able to continue.

MS. MORRIS: Pam?

MS. YOCHEM: Our organization belongs to

the National Association of Green Laboratories, and traditionally, the president of that organization does testimony to the Appropriations Committees every year on both the House and Senate side. That testimony always include strong support for NOAA Fisheries.

I heard this year they didn't have hearings. My understanding was the organizations would submit -- the organizations would submit a letter anyway, but I heard there were no actual hearings or opportunities for people to go before the committees. Am I misunderstanding that?

DR. DOREMUS: No, there were hearings, as is traditionally the case. They do it slightly differently each year. The Secretary did brief the Appropriations Committee. There were fewer opportunities than in previous years. The NOAA Administrator, if I recall correctly, did not brief directly. It was done at the secretarial level.

MS. YOCHEM: Maybe there wasn't as much opportunity for public comment?

DR. DOREMUS: Not in the form of a hearing. There is always the opportunity to communicate directly with the Appropriations Committees, and we encourage people to do that.

MS. YOCHEM: That is what the organization did, I think, sent the letter straight to the committee, as opposed to doing that plus the in person.

DR. DOREMUS: That matters. In person helps. Conveying your views matters a lot.

MS. MORRIS: Thank you, Paul, for a clear and realistic picture. I thought I heard you say something in there about what we could do to help, so say that again.

DR. DOREMUS: Congressional processes are public processes. All of you as individuals have the opportunity to weigh in. Many of you do, some of you can institutionally, the commission directors have been very active in recent years, especially engaging Congress on aspects of our budget. All of you have the ability to do that as well, and many do. I know Bob is very active on

the aquaculture front, among others among you.

We like to encourage people to weigh in. I always encourage people to look at the broad context of fisheries and what we are trying to accomplish as a whole. We have a tendency in Congress particularly these days to focus on small pieces and sometimes miss the bigger picture.

I think Peter's question about where are we going with the ability to realistically bring the science and management along with ecosystem-based approaches, where the councils are trying to push, that is a big picture question. Some of the long-term strategy issues need to be thought of and addressed.

I think this recapitalization issue is huge. We can't continue to pretend that our observing system assets level funding and our physical plant and equipment is going to sustain the science of the future. We have been pretending for years that is the case and it is not.

Those are some of the things we have the

opportunity to discuss as a committee and inform your individual conveying of views to Congress.

MS. MORRIS: Thanks, Paul. We are ready to move on to science updates. Thank you again.

DR. DOREMUS: Thank you.

DR. STEIN: Good morning, everyone. I am standing in for Richard Merrick. I am going to give you two updates on the national climate science strategy, where we are going with that, and then ecosystem-based fisheries management. I understand he has already briefed you on these, and this is strictly an update.

I will start with the national science strategy and what we call the "RAPs." No, I'm not going to rap. Regional action plans, which is really the implementation plan for the strategy.

The goal is here, and it really is to meet the demand that we are getting for increased delivery and obviously production of climate related information, recognizing that the environment is changing.

Here on the West Coast, as Randy

mentioned, harmful algal blooms, which I'll talk about a little later, and then what was called the "warm blob." I just want to say that Nick Bond, the state climatologist from Washington, came up with that name. It was actually quite good. He was like kind of looks like a blob. It was an incredibly effective communication tool to explain the physics and the oceanography that was going on there.

He said it wasn't like it was hot, but it was up to 6 degrees at times warmer than normal. That is just huge. Our ability to communicate that, to try to analyze what that means for the resources was critically important, and it showed our lack of understanding at times of why these things happen.

One way to put it is that warm blob didn't cause the weather but the weather caused the blob. What I mean by that is it heated up instead of being stormy.

Some of us, and Nick in particular and others, sort of suggested that was a dress

rehearsal for what we may see in the future, and obviously not every year. I think it sort of puts a fine point on the need for this kind of science strategy and the products that informs it.

What I want to go through here, I think you have seen this before, these are the seven interdependent elements of the strategy, sort of built off what Paul was saying. You need the infrastructure at the bottom to be able to provide that information.

Number six there, status and trends, early warnings, I will talk about early warnings as an example later. It really is just to know where we are and what is coming.

You need to understand the processes and the mechanisms if you are going to be able to project or forecast what is coming down the road.

For us on the West Coast, a key element for this, and I see Chuck over there, he can either agree with me or not, but I think he will -- that when you have something called an integrated ecosystem assessment -- I don't know if

Richard has talked to you about that in the past, but it is a key tool for us to implement this strategy and other aspects. Really what we want to do is make that IEA framework how we do business.

It took a little while but the council is very engaged now. Be careful what you ask for. Now they want us to do even more, which is a good thing.

At the top, two things. Robust management strategies, and that is a place where the agency has a consequence of the program reviews, science program reviews that we have been undertaking, that each science center was given funding to hire a stock assessment scientist that would be dedicated to management strategy evaluations, which is really a way to look at either tradeoffs or under a changing climate, which strategies will work best.

Through that cycle, you ask the question which will work best, and given the amount of information you have, will you be able to see the

difference. It could tell you whether or not you need to increase your survey capability or temporal or spatial, or you know it is adequate.

Ultimately, it is to get to this idea of climate informed reference points. In other words, what do we think our populations are going to be like in the future. Folks on the East Coast have certainly thought about that as related to cod. We are seeing shifts in distribution of species on the West Coast as well.

It is how to think about that, and then you have to start thinking about will those reference points change over time because of climate. That is going to be a big area of research as we go forward.

As I mentioned, we have the strategy. It has been well received, I think, overall. Now each science center is in the process of developing what we are calling the regional action plans, which is really the implementation plans. It is for a 3 to 5 year time frame. We have the WRAP, the Western regional action plan, that is

jointly done between Northwest Center and Southwest Center, since we serve with one council, and again, for efficiencies' sake, we decided to do it together.

As I mentioned, the IEA for us is a critical component, assessment of our overall surveys and whether or not we need to tweak some of those as we move forward. It is just part of the plan. As I mentioned, management strategy evaluations, looking at changing reference points type of questions will be an essential element.

We have done a lot of ecosystem-based and climate- based work with salmon, and that will continue. We have an MSE, just as an example of something concrete, underway for hake, which is managed jointly with Canada. There are some real questions there about perhaps changing how we do that management.

As I think Mike alluded to, species on the West Coast, and very valuable, the sablefish, which is distributed coast-wide, and we are working on that.

Another factor within our action plan, for example, is looking at stock assessments and implementing or adding to them the environmental factors as warranted to help guide those assessments.

I think you have seen this map before. It gives you an idea of where the plans will be developed. There will be more than one in Alaska, acknowledging that there is more than one ecosystem up there. They started with the Bering Sea, which is not a surprise, I don't think to anyone. We have our draft done for the West Coast.

We are looking for comments. It is draft. This is a big undertaking, a big effort. We are looking for a lot of input, working with Randy to get it out and available to folks that he has connections with. We have talked to the council, and we will talk to the council in June. I think we look overall as an agency to have all the plans done and approved or in place by October.

We are doing an ecosystem science review this year, and at each review, the appropriate regional action plan will also be part of that review. Again, to get input and advice going forward, especially since it is dealing with what we have, so how can we find those efficiencies.

I will pause there, if there are questions.

MS. MORRIS: Peter?

MR. MOORE: I have a question about the MSEs. Have you done one already?

DR. STEIN: We are in the process of doing one for hake. Thank you for the question. MSE is not something where you say we are going to do it tomorrow and I'll be done by the end of the week, as you may be well aware. It can take with the complexity a couple of years. It needs to be an informed and interactive process.

It is like, Peter, what you want to do management- wise. That is not for us to decide. That sets the stage for the content of the management strategy evaluation. It really is to

illuminate and look for robustness but also illuminate the tradeoffs.

MR. MOORE: Right. That was my question. I am on the Herring Advisory Panel in New England. When I looked at the whole kind of mandate, wow, this is a big undertaking, and they are making the tent as big as possible, in terms of participation.

You might get people like me who know a ton about it, and you might get a lot of people who know nothing about it. I just wonder is there sort of a set of guidelines about who manages the process. It is going to be a circus back there. How much of this is the political tradeoff that basically goes on at the council and how much of it is really kind of looking at the science and the place of that organism in the ecosystem.

DR. STEIN: Right. It is in sense both to be effective. At the core of an MSE is a model, sort of how the system works, and then what you say is how do you want to manage herring, you can manage it this way, this way, or this way.

Then you say what kind of information do we have related to herring and the environment, run that through the model to say okay, given this, I'm going to harvest herring by X, and the environment is going to do Y. Out the other end comes yeah, you overfished, oops, that one didn't work, or you rarely overfished, given environmental change.

Then you come back and share it with the managers and others and see how they react to that, and you may go, hmm, let's tweak this, let's change it. It becomes iterative.

MR. MOORE: My feeling is I feel at least with the East Coast and on that particular species, we kind of have been through that a lot. I would argue it has been fairly consistently managed with reasonably good results.

The one piece that I think we are missing back there is this transboundary aspect, the transboundary species. I don't believe the MSE is going to include the Canadians, which is crazy. I'm pretty sure that's correct. We have had our issues with them over the years on how to

do this.

It will be interesting. I think the question of who manages the process, that would be the agency manages the process or is it the council?

DR. STEIN: That's a good question. I can speak -- I think it can vary by topic, issue, by region. For hake, it's done through the U.S./Canada joint effort. We are the ones trying to shape the discussion, but it is very much a joint effort. If it's managed, I would say it's managed by that joint management structure.

MR. MOORE: Okay, thank you.

DR. STEIN: You're welcome.

MS. MORRIS: Any questions? Mike?

MR. OKONIEWSKI: The 6 degrees I think you mentioned, is that Fahrenheit?

DR. STEIN: That was in Fahrenheit, yes.

MR. OKONIEWSKI: The second piece of it is when you were doing your survey work or establishing this, were you able to I guess determine if there was any difference in the food

webs?

DR. STEIN: Well, let me just put it this way, Mike. Randy knows this. On the salmon side, pinks came back to Puget Sound, they look like trout. This is the first time I've seen --

MS. MORRIS: Looked white.

DR. STEIN: And they looked white. They were half the size. This is really the first time where the adult -- the final years of recruitment where we actually saw real food supply issues. This was major. There was basically not very much food out there.

MR. OKONIEWSKI: Just a brief mention, in Southeast Alaska, we have a small plant up there that does chump salmon, 87 percent were pale meat this year, normally it is about 60/40 or 40/60. Pale meat and chump are worth a lot less money. It seemed to be weaker than I've ever seen it, and that is a qualitative determination, but if you could put it on a table, normally they are like little soccer balls, and after a while started to look like a deflated tire.

We did some analysis and compared it to some studies, it was lower than those studies had ever seen. These were done some years back. Not much to go on.

DR. STEIN: That is the kind of thing that we need to pull together. I think there is some real information out there. Sort of like the pinks, real gradient, Southeast, not too bad, and then you went south --

MR. OKONIEWSKI: A question that was asked at the hatcheries, they were running into difficulties doing egg recovery. It might be a place to look to.

DR. STEIN: That's true. Thanks.

MS. MORRIS: Heather?

MS. BRANDON: Can you talk a little bit more about the ecosystem program reviews? I think Alaska's is next week.

DR. STEIN: I believe so.

MS. BRANDON: I looked at the agenda and it looked like several days of a comprehensive presentation on what they're doing now, and then

opportunity for public input. I am sort of unclear as to what the public would say. There is a closed session where things will be discussed. I was just wondering, what are you reviewing yourselves for?

DR. STEIN: (Laughter) Because Richard said we should do this. No. (Laughter) It's a cornerstone foundation, hallmark, what are you going to say about science, do peer review. To do an assessment, just ask the question of your peers, how are we doing. Richard, I think, quite rightfully felt we should do it by our major components.

The first two were related to magnets and stevenbacks, and we did data, because that is so critically important to managing fish, and then we did the assessment process itself, not individual assessments, but how are we doing assessments.

Last year, I think we did two last year, we did protected species because of the salmon program, we felt we had to do that separately, and

we did that jointly with the Southwest Center, and then we did marine mammals and turtles jointly.

This year is then the ecosystem component. There is no real bright line. You can see some of the salmon stuff could be there, so it is really to look at our ecosystem science portfolio and how we are approaching that.

So, it is in-depth, usually 3 to 4 days, starts out with -- it's a panel of independent folks from academia, within other parts of NOAA, some other science centers, chaired by somebody outside Fisheries. Then we have 2 to 3 days of in-depth looking at the science and looking at the program itself to ask the question does the program structure make any sense.

To me, there are two basic questions. Are we doing good science, in other words of high quality, and are we doing the right science, are we meeting the needs of our regional offices and constituents. We have a set of questions that kind of go a little deeper related to those two.

We really want people to be engaged and

attend, to learn, to listen, to have comments, and then the last couple of days are for the panel. Usually, you start on Monday afternoon, let's say, goes through Wednesday afternoon, then give the panel Thursday to deliberate, get their thoughts down.

We like them to give us at least a rough draft of a report. On Friday morning, they report out to center leadership, Richard or Eileen, if she's present, saying here is what we find. We give that to the panel chair and panel to decide whether or not they want to do that in an open context or in sort of a smaller group, if they have something they really want to tell me.

MS. BRANDON: Thank you.

MS. SOBECK: It is a great way to get kind of a survey of what the center is doing in a particular area that you can't necessarily just get from looking at the Web site. They do really prepare parts that are actually pretty tight presentations, and then there are questions by the panel, and if there is time, there can be

questions from the public.

The closed sessions are really for the panel to deliberate among itself and give a very short readout to center leadership, and then the panel's report is published on the Web site. The center's response is published on the Web site. After we do the whole cycle with each individual center, the chief scientist, Richard Merrick, puts together kind of a national plan to respond to the kind of overall programmatic review.

You can see kind of the result, if you wanted to go to the Alaska Center, you could see kind of what it looks like for the reviews of the previous programs and decide whether you thought it was worth sitting through.

DR. STEIN: Thank you, Eileen. One other point. Each one will be a little different when it comes to ecosystems. Alaska, I think, is going by their ecosystems. We will structure ours in a context around the IEA, and it won't be just about IEA, but we will use that framework to think about our science.

MS. MORRIS: Randy? Then we are going to move on to the rest of your presentation after that.

MR. FISHER: I'm just curious to see whether you think the current council process can react fast enough to the changes that may be happening. That's one question. The second question is as we know, there is going to be winners and losers in this game.

DR. STEIN: Correct.

MR. FISHER: I would hope that we are not just looking at things from a protective aspect but we are also looking at things from an opportunity for some fisheries that may happen because things are changing for the good.

DR. STEIN: To your last point, absolutely, it is to take an ecosystem view, right, there will be hmm, those guys really shifted, but look at all these that came in or increased. Those kinds of shifts will happen. We hope it's not a shift to really lots of jellyfish, because I don't really like jellyfish.

MR. FISHER: What about the council process?

DR. STEIN: That's a fair question. I don't tend to use forecasts because I listen to my weather service folks, and when it comes to climate, I talk about projections. It is, therefore, going to be up to us as far as the data we can get, the understanding and improvement in understanding we can get, to how long should those projections be, if we can increase those then it will help the council to be able to be responsive.

But things like a big El Nino like we're having right now, I don't know, it may need to be more flexible and adaptive as we go forward because of changes. Certainly our ecosystems can change really rapidly on the West Coast, because of the current system.

MS. MORRIS: Okay. On with the second part of your presentation.

DR. STEIN: I will try to do it quickly. Ecosystem-based fisheries management. I see this as interdependent, not independent, from the

national climate science strategy. It is a systematic approach to fisheries management in a region, in the context of what we will talk about later, resilience and sustainability of the ecosystem. In my terminology, it goes from the physics to humans, and then looking to optimize benefits for society.

Chuck has heard me say this to the council and others, ecosystem-based fisheries management is where we really make humans part of the system rather than not just a pressure or a threat.

As one of my social scientists used to say -- he passed away recently unfortunately -- John, you have to remember, people really like roads, too. His point was people/society want certain things. We need to work within that context as well and think about what society would like, what their goals are, and not just be thinking of what is the threat to the system, the system is there to benefit us as well.

I'm going to talk about status. The

policy itself is open for public comment. We have received comments from a range of folks. You can see what the main comments are. We don't perceive -- Richard doesn't perceive -- we are in the process of reviewing and editing the policy in regard to the comments. He does not see a major change, doesn't see wholesale changes, but sees it more on the clarification side.

The roadmap itself then, we have the policy and the next point is how would we actually implement the policy, which we in part are doing already. We just call it the fisheries management roadmap. That is in draft form as we speak right now.

We are shooting for the first draft to be finalized and open for what Richard is calling "informal public comments" this spring. The roadmap itself will have a background section. It will speak to the guiding principles that are in the policy in relation to the roadmap. It will give context and caveats for the implementation plan, which is the roadmap. It will speak to the

core components needed to implement ecosystem-based fisheries management, and it looks to how NMFS will need to work with its partners to actually do the implementation.

This is for your edification and view. It just gives you an idea where we are in certain things, like the fourth from the bottom, the science reviews. As Peter was mentioning, councils are at different places with respect to the fisheries ecosystem plans.

I can speak from my experience on the West Coast that the Fisheries Management Council was putting into place that fisheries ecosystem plan and being willing to have the science centers work in support of that, and the plan itself then incorporates the elements of the IEA, so it is really given a strong foundation for us to better deliver science within the context of an ecosystem context to the council.

I would just like to note from folks involved with the councils that we very much appreciate and applaud their support and awareness

of what we are trying to do here, and thanks to all of them as we go forward.

This states what I think Eileen mentioned yesterday. We are committed to an ecosystem approach. We want to move towards an ecosystem approach, to ecosystem- based fisheries management, and ultimately also engage on ecosystem-based management, which is clearly not just within NOAA's bailiwick.

I will not say "Raimundo's" name probably correct but he mentioned marine special planning in Puerto Rico. It is having a mixed reception here, but on the West Coast, we are still trying to move forward within that context, and really it revolves around data.

There is a lot of agreement on the West Coast that if we could take those various datasets, make them more available, knit them together up and down the coast, it would aid in a number of decision-making frameworks as we go forward.

We stood up the regional planning body,

I just wanted to mention that. We are signing the charter as we speak, and the council signed it.

I bring that up because we are doing part of this now already, and this just gives it more focus, more clarity, as we move forward in the dialogue with councils and stakeholders. It is critically important.

That's it.

MS. MORRIS: Any questions on the ecosystem-based fisheries management part? Erika?

MS. FELLER: I don't know if it's a question so much as a comment. One of the things I've not seen at least in the draft strategy in is how habitat fits into this, for species that are habitat limited.

It seems to really kind of focus more on stuff that happens at sea, but everything in the Gulf of Maine, it is river herring and shad. If you want more river herring than shad, you can either restrict people or open up rivers, that end of it, I'm just not seeing there, how that kind of fits in.

There is not a ton of science on habitat requirements for a lot of species, the Pacific Marine and Estuarine Partnership is just kind of pulling together data that not really anybody has looked at in a long time about what habitat requirements are. How does that stuff fit into this?

DR. STEIN: For the West Coast, a key element for us to think about in an ecosystem approach is an ecosystem model. Our ecosystem model is based on Atlantis, and that is habitat based. At the foundation is the habitat, and then the biogeochemical processes that feed the nutrient cycle.

Maybe we need to make it more explicit, note that, but it is implicit that it is foundational in how we have to think about it. It does start to raise those uncertainties and the lack of information about those linkages between nearshore/offshore.

MS. FELLER: I have a follow up. That sort of also suggests, whatever it is that spits

out the other end of this planning process, like what are you going to do for that habitat. That is outside the range of the authority that most councils have.

DR. STEIN: Correct.

MS. FELLER: To regulate. It sort of implies do we want to think of it maybe different from what Fisheries has done or thought about in terms of conservation management in the past.

DR. STEIN: We fully recognize that, and in that spectrum of going to ecosystem-based management, yes, it becomes where is that forum to work across all these sectors. That is the big challenge. We are on the West Coast. Where does that group go/meet? It doesn't exist.

You need to kind of find ways to have that happen. It does put Fisheries and NOAA needing to interact more to start the influence, and I think the council has done a pretty good job of writing letters to say look, this really affects our trust species and system to move forward.

MS. MORRIS: Eileen?

MS. SOBECK: I think that kind of comment is good and we should make sure if we can in the policy and if not, for sure in the roadmap, address habitat. Here on the West Coast when we are talking about salmon, we do talk about habitat all the time because we also have the ESA driver.

We have actually put in our budget in the last few years requests for research funds to do research on coastal habitats that we think -- we acknowledge there are some gaps. We have gotten zero traction in the past. To the extent we do it, we will have to do it out of sort of available funds.

I think it is okay that some of this will be outside the purview of the council because we have other programs in NOAA we can use to influence it, the council can use its influence to make requests or pass information along to other bodies. I think the reality is this is the next step, we are going to have to work collaboratively outside of our lanes. I think it's a good point

but I don't think it should preclude us from going forward.

DR. STEIN: That's a good question, thank you. One of the big science challenges is we can build the Atlantis box for the California current or other places. That works pretty well. When you start to really get it together with the watersheds, there is some work to be done there, to get that right. What you want is you want these models to run, you want it to accurately reflect reality rather than -- you know it's not working, you run, run, run, and the whole system crashes and goes away. We know that is not how to do that. It takes a while to get it right. It is a critical component.

MS. MORRIS: I'm not seeing other hands, and it would be good to move on to the next presentation about resilience in fishing communities. Thank you, John, very much.

The presenters are Steve and Sarah. Sarah?

MS. TOWNE: Hi, I am Sarah Towne. I

work on the Catch Share Program for the West Coast Region in Seattle, and this is my supervisor, Steve Freese, who is our regional economist, and he is here to answer any hard questions you have today. (Laughter)

Steve and I participated in a workgroup that includes the Greater Atlantic Region in Gloucester and the West Coast Region in Seattle and Long Beach. We formed the group to study and discuss fishing communities resilience. We are here today to present our findings, and also thank you for having us.

Before we start, I just want to mention we have a two-page handout. Refer to the handout, that is probably the most useful document.

From the Department of Commerce, NOAA, NOAA Fisheries, and our regional offices, the term "community resilience" is a key element in a lot of our strategic planning documents.

In the Department of Commerce strategic plan, I think the goal is to ensure that communities and businesses have enough

information, products and services to prepare for and prosper in a changing environment.

NOAA's annual guidance memo promotes our core mission of healthy ecosystems, communities, and economies that are resilient. NOAA Fisheries strategic plan with sustainable and resilient fisheries and fishing communities as a main goal, and then the Greater Atlantic Region has a strategic plan that takes an integrated approach to enhanced fishing community resilience, and then our West Coast Region strategic plan has a goal to ensure sustainable and productive West Coast fisheries and resilient fishing communities.

It is a term that comes up a lot in our goals. As these most recent regional strategic plans were put together, colleagues in Gloucester, Seattle and Long Beach got together and asked what is fishing community resilience exactly.

We formed a study group to develop a better understanding of fishing community resilience. We wanted to learn about existing resilience efforts within NOAA, learn from each

other about incorporating fishing community resilience into our regional programs, and learn about facing these challenges by each region.

We wanted to define what we mean by fishing community and fishing community resilience, and really think through that meaning. We wanted to identify issues, gaps, and recommendations to better meet our fishing community resilience goals.

We haven't cracked the code, we haven't done anything revolutionary in our study group, but we are two regions that got together to better understand what fishing community resilience means and figure out how we can incorporate that.

We are also trying to figure out what our goal is and how to support fishing community resilience and move the conversation forward.

There were a lot of members in the study group, but Steve and I just live the closest, so we are presenting today. But from the Greater Atlantic Region, we had Harry Mears, Peter Burns, Colleen Coogan, and Chris Volkey (phonetic), and

from the West Coast Region, we had Jennifer Esay (phonetic), Steve Reeves (phonetic), myself, Jamie Gowan (phonetic), and Tonya Wick (phonetic).

This was a regional study group but we wanted to bring in fishing community experts from the science centers. We asked Patricia Clay and Liza Coburn to participate as consultants, they are from the Northeast Fisheries Science Center, and then Suzanne from Northwest Fisheries Science Center.

It was a great group to work with, and really interesting to hear about everyone's experiences.

As we started talking about fishing community resilience, we realized we needed to think about what we meant by fishing community first. We identified three types of fishing communities that NOAA Fisheries might consider.

First, the Magnuson-Stevens Act identified them as substantially dependent on or substantially engaged in the harvest or processing of fishery resources. An example of this type of

community might be Dutch Harbor in Alaska or Cape Maine.

Community resilience is a complex topic, so we wanted to think outside the box about municipalities and other types of communities that might influence how we think about resilience.

For the definition, we included communities of interest, something other than location, target species or industry sector. Examples may include the New England groundfish, and on the West Coast, the U.S. Offshore Lobster Fishery, the Alaska Long Island Halibut, things like that. We thought communities of interest were really important when we are thinking about fishing community resilience because in some cases fishermen and processors might rely on these types of community networks more than the communities that they live in for certain issues.

For example, if I was the only commercial fisherman in my town, I would probably be more likely to reach out to someone that lives 100 or even 1,000 miles away that was in my sector

rather than a neighbor who is a recreational fisherman.

The third type that we included were areas within communities for fishing and fishing related industries. You can just think of it as a fishing neighborhood, like the Ballard neighborhood in Seattle or Point Judith area in Rhode Island.

We thought these fishing neighborhoods were important to consider in terms of resilience because a whole town or city might not be fishing focused, but the neighborhoods in that city could have an important seafood focus, be an economic hub, or subculture there. We didn't want to overlook those when we are thinking about resilience.

Just to circle back, our working group thought it was important to define fishing community as more than a municipality, so we included these three types of communities that you could consider alone or in conjunction when thinking about fishing community resilience.

Once we wrapped our head around what we meant by fishing community, we started to think about resilience. We looked at many definitions of resilience and we decided on the following, "Fishing community resilience is the ability of a fishing community to withstand, recover costs, and successfully adapt to change."

What kind of changes are we talking about here? Our study group discussed many changes that impact fishing communities and their effects on their resilience. Some of these changes include natural and manmade disasters like hurricanes, storms, oil spills, and ocean and weather conditions like the warm blob, algal blooms, El Nino, that can affect reproduction and species survival.

Regulatory changes also affect fishing communities obviously, and can have effects on fisheries infrastructure. Some examples of regulatory changes include catch reduction, limited entry programs and catcher programs that limit the number of people. Equipment standards,

observing and monitoring costs, building codes. Anyone who is an industry member can probably think of about 100 other types of regulations.

Consumer and market trends impact fishing communities like domestic and international trends on boycotts, sustainable seafood labeling, price competition.

The last one is gradual changes, some of these include climate change or other environmental issues like drought, competition for space and waterfront, condo's coming in, zoning, high operational costs.

We added these factors into our definition to be clear about the type of changes that we think might affect fishing communities.

Getting to the working definition, we were drawing from experiences of everyone in the region and fishermen, other industry members.

I put together some of the key points outside of our definition that we came up with. First, fishing communities constantly have to adapt to many factors in order to be resilient.

For instance, science, habitat, and changing Federal regulations clearly fall within NOAA's purview, but local zoning, regulation, infrastructure, or preventing climate change to some extent don't fall into NOAA Fisheries' immediate ability to respond. But we may be able to help coordinate information to assist communities with things that are not within NOAA's immediate scope.

We realize that many fishermen, fishing associations, NGOs, are already working on a lot of the issues that affect fishing community resilience. Our challenge is to find where we can add value and support fishing community resilience.

As we got off on tangents in our working group, which happens all the time, we would often step back and say what does the fishing community need to be resilient, and these are kind of the main factors that we kept coming back to, fish, fishermen, fish buyers and processors, infrastructure, like ice houses and docks,

reasonable operating costs and healthy markets for their products.

We also reviewed and discussed a paper by Steve and Kate that concluded that systems with higher diversity had higher resiliency, so we talked a lot about that in the context of fishermen's portfolios and options, so fishermen who participate in multiple fisheries might be more resilient. Same thing with processors, many species, meaning more resiliency. That was the context we discussed that paper in.

Wrapping up, some potential next steps. To make sure we had a clear working definition for fishing communities and resilience that will help us with strategic priorities, and that was from learning from each other, and we became more aware of fishing communities.

We obviously do a lot of formal thinking about fishing communities with our regulations and actions, but we really wanted to think about the definition and talk about fishing community resilience so it became part of an every day

mindset.

Just because we are actively thinking about resilience, it doesn't mean we have all the answers. We need to figure out the best way to communicate with fishing communities to find out their needs and learn about the work they are already doing.

We also need to coordinate with our colleagues within NOAA and MNPS to learn more about the resilience efforts that are ongoing. We see this as an ongoing conversation, iterative, cooperative process, that is going to evolve over time. We are just trying to figure out our role and understand our strategic plans and how we can better support fishing community resilience.

If you have any questions or feedback, we would love to hear it. We just wanted to report back the findings from our work group and get any feedback from you.

MS. MORRIS: Dave?

MR. DONALDSON: Thanks for the presentation, very interesting. I'm curious why

the Gulf was not included in your discussions.
(Laughter)

MS. TOWNE: I think it just worked out that at the same time our regions were doing our strategic plans and we had contacts there that were working on similar programs, so we just were like, hey, what does this mean? Have you guys thought about this? And it was just an informal work group, but it would be interesting to extend it out. Obviously there's other regions with a lot of experience.

MR. DONALDSON: Okay, thanks.

MS. MORRIS: Mike? Mike wants Harlon to go first. Okay, Harlon?

MR. PEARCE: I agree with this question, too. I think in the Gulf, particularly Louisiana, we coined the word "resilience." One thing I liked about your discussion is because you talked about change. I think we focus on just change, whether it's climate, whether it's (inaudible), but change needs people to keep looking not at any one of those, but all those as part of the change

(inaudible) be able to react to it in a better way as a group here, but as (inaudible) process as well is how do we react to change and do a better job and a speedier job Of that?

In Louisiana, our ports are basically there for fisheries or for oil, too. In fact, fisheries came first, oil came second. The little communities we developed around our fisheries are a big part of what we do, all of our little coastal towns in Louisiana. Then the oil came and created another reason for those ports to be there. And I think in Louisiana we have (Inaudible) in the country. It is a big deal to be resilient. We are looking at a lot of different changes down there right now. We are not focused on climate change. It is still a dirty word down there. People don't realize what's going on when you consider what's happened in the West Coast and the East Coast and (Inaudible). I do think the ability to be resilient, which I find that (Inaudible) all our fisheries are pretty resilient in what they do,

but it is very important to this country to make sure we keep these communities thriving and moving in the future, very important.

MS. MORRIS: Mike?

MR. OKONIEWSKI: Thank you for the presentation. I think this is welcome, I guess in my mind. I do think fundamentally the circulatory system of the fishing community is you have to have an income stream, and that means fish, pretty simple. The recreational side needs fish in order to attract the people that come to the water to fish. If they're going to spend money in the community, you still need fish.

You need jobs, to be able to support a job base, people going ahead rather than behind. You need really a margin on your investment, if you're going to put money into something, you want a margin, whether it's a fishing boat, a processing plant, a charter boat, whatever you have.

I think you have to get down to that level before you are going to understand how

resilient these communities are. I also think if you really want to understand what is making us less resilient, you are going to have to look at some of the regulations or programs in place presently that are keeping us held back from achieving that resiliency.

I can think of one program on the West Coast and I can think of another one in Kodiak right now. We have two councils right now that I think are kind of tone death to the whole thing. I'm not saying NMFS, I don't know that, but they have been, I think, up to this point, at least on the West Coast. I'm not sure about in the Alaska region.

These are big problems, if you want to get some kind of resiliency and stop erosion of resiliency, jobs, income streams and other things that are necessary to keep that community alive.

If you look at Washington, D.C., or Puget Sound Naval Shipyard, you have a big government facility that basically has money coming in and produces an income stream. Our

income stream is relying on fish, it is that simple.

If you are putting a bunch of regulations or just for protection only, conservation only, which are necessary, but you're not looking at the economic side of what effects those may be, or somehow using a matrix to see where the pluses and minuses are, you are leaving something out of the equation. That hurts the communities.

I've lived in coastal communities pretty much all my life. I will just say that and leave it at that. I do welcome the fact that you are bringing this forth.

MS. MORRIS: Rai?

MR. ESPINOZA: Thank you. It's really great to hear that you have taken fishing communities to further integrate into your daily thought process and how that could really impact a lot of the work you could be working on.

One thing as a little bit of feedback, when we talk about resilience for ecosystems and

for infrastructure, it is one thing when we say recover. When we talk about recovery or to expand, we have a base we are referring to, when we recover to a certain point.

Many fishing communities, they need to do more than recover. Sometimes you need to provide the opportunity to thrive. For the definition, I was referring to communities of people. I would suggest in your definition, you include "withstand, recover." "Adapt to change" doesn't mean necessarily you're going to thrive. I would suggest to include provide the opportunity to thrive for these communities. I guess that also builds in the concept of providing economy opportunities.

At the same time, in the fishing communities, they are really the front line of the fishing industry, it is the front line for science, to provide science, for regulations, and also for the environmental centers. These are the folks that are out there day after day, this is their life.

This is something that I think we need to recognize that and to really further promote the importance of community resilience from the person's point of view that it needs to be provided more than just a status quo to recover based on we don't know what that was. We need to provide the opportunity to thrive.

MS. TOWNE: Thank you. We will bring that back to our group.

MS. MORRIS: Liz?

MS. HAMILTON: Yesterday -- nice to see you, Steve, and thank you, Sarah, for the presentation. Yesterday I spoke to one of my small business clients who are canceling between 3 and $4 million in orders due to an environmental and regulatory problem up in Puget Sound.

You mentioned sport anglers, but I'm hoping you are deeply integrating the sport fishing industry into what you are doing. All the things that you list that plague fishing businesses include our businesses as well, deeply.

MS. MORRIS: Columbus?

MS. TOWNE: It is really important we think outside of just the programs we manage. Thank you for that comment.

MR. BROWN: Thank you for your report. I think it would be also important to look at some of the recent and evolving fishing communities, especially in the Gulf. You have the Vietnamese fishing communities that have recently evolved. Lessons learned from them and how they were able to get back to work after Katrina and other casualties.

MS. MORRIS: Ted?

MR. AMES: Thank you. Thank you for your presentation. This whole concept of resilience is especially important to us in Northeastern New England. We were resilient but unfortunately I think it would not be bad if you added another component which includes in-shore versus offshore.

Basically, our fleet, particularly in Eastern Maine, in the 60 odd fishing villages that are there, most of them are totally dependent on

just one species a day in Gloucester, but traditionally, we had a suite of fisheries, most of them controlled by Federal management, and when winter comes, it is not good to go too far offshore in the Gulf of Maine, and people would switch to scallops and groundfishing in between.

Because this fleet of boats is basically part- timers in the eyes of the regulations. Most Maine fishermen lost access to anything outside the three mile limit, except for our lobster fishery. What we really need to get resilience back into our fishing communities is to develop some means for allowing fishermen access to those grounds again. It doesn't have to be a million or thousand fisher boats.

In Stonington alone, we have about 400 fishing vessels, probably 150 of them have access to lobsters offshore. That is the only species. The rest make their living inside the three mile limit. It is just incredible that the lobster industry has done as well as it has.

I really think it would be important if

you want to put resilience into the fishing villages that I know are numerous in Alaska, there has to be some consideration of how to protect and create resilience in the species that these smaller community folks can access.

I think you guys have done a pretty good job of opening it up, and I hope you can look at this.

MS. MORRIS: Peter Shelley?

MR. SHELLEY: Good presentation, thank you. Ted covered some of my points. I didn't hear and I was wondering whether you considered creating some sort of vulnerability index, so Ted's point is a good one. 80 percent of the fishing revenues in Maine are coming from lobsters, period. That seems to be a pretty highly vulnerable economic/social strategy, if anything happens to lobster. Things always happen to species.

I wondered if you had thought about trying to focus attention on some of those communities that are sort of highly leveraged

around species that might be vulnerable to climate change. That's one point.

Second, Ted also mentioned this, at least in New England, no one is very confident in the data that gets collected on the socioeconomic side of management planning, because there are a lot of part-timers. It's difficult. Some of the most resilient fishermen do blueberries, they cut wood, they eat lobster. They are resilient because they actually have businesses that are land and sea. I wondered how good you feel the data is to allow you to really focus in on where the issues are.

The final thing I just wanted to mention, I think training and retraining programs are really valuable and important, and a couple of times they were offered seriously in New England, they were enthusiastically embraced by a lot of the fishing communities who wanted to learn other skills, wanted to learn to become nurses or become more resilient economically. Whether you saw any partnerships with Sea Grant or programs like that

in thinking about solutions to resiliency problems that you identify.

MR. FREESE: Vulnerability index, I played around with that stuff as part of our West Coast planning on (Inaudible). And I do know that there is a national group of sociologists that are -- there's a web page they developed. (inaudible) way back then, so my question is whether we should calculate these things as part of the safe reports (inaudible) FMPs.

On the second issue on job retraining, I agree there's a difference to it. It used to be disaster relief funds (Inaudible) interesting ways. And I've worked with the state organizations in Washington, Oregon, and California, but the final (inaudible) I don't know if it's good or bad, but now (inaudible) disaster relief of only just writing a check to the fishermen and we don't really have other programs talking about job retraining.

What was your third point?

MR. AMES: Sea Grant. One of the things

that has always struck me, and I grew up on a farm, so I sort am used to the land grant side, which seemed to be much more structured in terms of policy, advancement of program development. On the marine side, the Sea Grant program seems to be highly dependent on each state and what the professional interests of the people in the Sea Grant program happen to be.

It's a tremendous resource available to fishing communities. I wondered if it could be harnessed or collaboratively worked with more to get at some of these real challenges that communities are going to face because of climate change.

MS. MORRIS: Do you have a comment, Chuck?

SPEAKER: I'd like to comment on Peter's remarks. The Science Board is trying to actively engage Sea Grant on the topic we are talking about. We have been successful in the Washington Sea Grant to set up a joint social science research project that looks at these kinds of

questions, and then also taking advantage of the boots on the ground, if you will, that Sea Grant has in some of the communities. You are right, it is a real asset.

MS. MORRIS: Jennifer also has a response.

MS. LUKENS: I just wanted to highlight for those of you who may not have been at our October meeting, we did actually have a presentation by Dr. Morrison on assessing the vulnerability of fish docks to climate change and what they were doing on that. It is in some of our materials from the meeting we had in November in Silver Spring.

MS. MORRIS: We also had a presentation about the vulnerability index of fishing communities.

MS. LUKENS: Yes.

MS. MORRIS: It is there, too.

MR. SHELLEY: Right. I didn't see it in this.

MS. TOWNE: No, we had (inaudible) sort

of looking at other initiatives within NOAA, but I didn't report those out here. I did see that on your agenda.

MS. MORRIS: Steve, did you have another response?

MR. FREESE: Can I ask you a question? You on your website a couple years, you were looking at (Inaudible) rebuilding parts of the Magnuson Act and it looks like you have a fisherman talk about we have to analyze the effects on small and large businesses, and somebody was saying maybe it's a good idea that we analyze the effects on small and large communities. So I don't know where that dialogue went, but I think that's an intriguing idea.

MS. MORRIS: Peter Moore.

MR. MOORE: Partly to Ted's point, the East Coast, as we see species distributions changing, there are potential opportunities opening up as others leave. We have a situation where we have sort of multi-jurisdictional issues between state and Federal management allocations

that are sort of dysfunctional, thinking about say black sea bass, if it is really going to come into the Gulf of Maine the way everybody thinks it is. It is going to be a predator on lobsters. It also is going to be a highly valuable opportunity for fishermen.

I think that is something I would encourage the system because it is not must NMFS and NOAA, it is ASMFC, all the politics associated with allocations and that process, but it is definitely going to happen. It is happening, not just with that species. There are others, chub mackerel is moving in more and more from the south. It's a huge resource all over the world, it doesn't exist in the northeast that much. It has been sort of intermittent. That is an opportunity. It is also a forge fish, that is going to be a big issue for usage.

I think building into this question of resiliency, there has to be adaptability in the management process, and sort of an assessment process for how can you be nimble enough as a

management and science structure to be able to open up these opportunities for people in a way that is sustainable but also economic.

One thing that we do use in the Mid-Atlantic Council among a few of the APs there is called a fishery performance report that is very well done in the Mid- Atlantic. I don't think we have done them in the New England Council. They are a chance for the staff of the council to sit down with the AP and say, at sort of an annual review, of what happened in the fishery. For any reason, why did it or did it not perform at the quotas that are set, was it weather, was it market, was it breakdown's, availability.

Basically, it's an informational process that I think would also feed into your kind of resiliency work. It is very much grassroots information. If you look at statistics, they're not catching it, or whatever. It is definitely some of the fine scale information that you would definitely benefit from in your work.

I don't know if the other councils use these or not. They are pretty effective in helping the council and the agency sort of understand the dynamics of the fishery from very much the fishermen and market side.

MS. MORRIS: We are overdue for a break. I am going to call on Julie. Julie, could you just give a pitch for what your subcommittee/resilience group is going to be talking about this afternoon on community resiliency, because it connects to this.

MS. BONNEY: Socioeconomic data and how that informs community resiliency, what kind of data you need to actually help communities prepare for whatever issues are coming their way. We have had one teleconference, and there is a workshop in Washington, D.C. next week. We are going to talk about our process.

MS. MORRIS: Steve and Sarah, are you going to be here in the late afternoon or not? You won't be here but Steve might be here. Great. Thank you both for your presentation and thanks

for the useful discussion.

We are going to take a break now, and be back in minutes.

(Recess)

MS. MORRIS: Back to John Stein, a presentation on harmful algal blooms. John, I see on our agenda this is called "forecasts," but you don't like to do forecasts, right?

DR. STEIN: That's a fair question, and I was going to speak to that, so thank you. I'd like to just start out with this is in the context of resilience, and I'd just like to point out that also the whole concept of resilience is an active area of research, both on the community side and ecological side.

Julie, as you mentioned, when it comes to 20-30 years out, relative to climate, it is a projection because our skill is relatively low. I am going to talk here about -- I wanted to point out that the Alaska Science Center is actually working on that 20- to 30-year time frame because the view is that if a fisherman is going to make a

decision to buy a new boat, they last 20-30 years, you kind of need to know what might be out there if you make that decision. They kind of think in that context.

Here, this is related to -- it has an economic impact but it's related to public health. The forecast is on the order of days, maybe a week, and the skills will be higher.

I'm standing in for my colleagues, Stephanie Moore and Vera Trainer. Stephanie is the one that is working right now in the lab to work on what we call -- I think Peter mentioned this -- lab in a can. I will talk about that, that thing on the right there. There is a whole lot of chemistry there, when you have it either on a dock or out in the water.

Vera has really done the foundational work on the biological oceanography of algal blooms on the West Coast to allow us to figure out where to actually put this in the water to help us forecast.

I think this slide sort of speaks to

some of the comments made in the last conversation about impact. This is relatively dated information, but it is the best we have at this point in time. Julie's comment about the need for socioeconomic data, I think, is shown here.

This lists at the U.S. and the impacts it can have based on an annual basis, and I would say it is significant.

Here, I want to make the point that if you start to look at a smaller scale, so this is Grace Harbour, which is on the Washington coast, and this number that you see here for tourism, the 3 to $4 million, that was at a national scale. Somebody decided they didn't want to dig razor clams and they go recreate someplace else.

Here in Grace Harbour, if they don't go razor clam digging, Grace Harbour doesn't get that money. Therefore, the number is $20 million in lost tourism if a full season of closure for the razor clam harvest.

You can see the people. It's a really big deal, and people get real excited about going

out and doing this. It is really important. For that county, it's critical.

Here, it just puts the context of resiliency in a more finer point, Washington State versus Grace Harbour versus the Indian Nation, you can see unemployment is high, individuals below the poverty line, high. Number of people on median incomes is low. People on food stamps is high. Any little impact to their ability to make money is high, therefore, is the community that resilient? Not too much. That is sort of the point.

This just gives you some pictures of this massive event that we had on the Washington coast. It was just unprecedented. It was coast-wide. We show the Shamada there because we use that vessel when we piggyback on a survey to go out and collect information up and down the coast on this. The razor clam was closed.

I think Vera did over 50 interviews over the course of months about this, this neurotoxin that affected the Dungeness crab, and as Randy

referred to, really hard hit, when they make a lot of money during Christmas, holiday season, and no one could fish because the levels of this toxin were just off the charts.

Here is a list, not totally comprehensive, but some of the species that are out there on the West Coast and other parts of the country. Our Gulf neighbors get to enjoy that one on a periodic basis. A lot of these things are quite toxic and can have very serious impacts, like death. Others cause vomiting, nausea.

Then we have Heterosigma which for aquaculture folks and fish farmers, this is very significant. We don't exactly know what the toxin is but it can cause very large distress.

MS. BONNEY: My husband's comment was could you just state the sections to get around the problem?

DR. STEIN: It's true that if the toxin accumulates in the pancreas, when the levels are really high, you still get concerned about some transfer. Mike, go ahead.

MR. OKONIEWSKI: I think 20 parts per million, and down here -- that transference is where they draw the line. They do two tests, one of the guts for 30 million parts per million, I think, and then 20, in the meat to be harvested, considered above the threshold anyway at that point.

We have had these events, I think, three or four times since 1994, but on the other hand, I've never seen one that has carried on this long, and I don't think the other ones ever got that high in the meat before. They were over 100 in some cases when they used the guts, but they never transferred into the meat. It might be a question of duration of exposure, too.

DR. STEIN: Putting it into context, this went from Channel Islands to the Aleutian's, like Mike indicated, instead of lasting weeks, it lasted months. You can see on the right there, that is what we saw in the water, in the ocean. It was like a monoculture, a lab culture. They were just bulging, like super cells.

SPEAKER: Is that a microscope -- is that the water?

DR. STEIN: That's a microscope, that is what we rarely see. That is just from out of a net. It's opaque. As referred to here, some of the levels in sardine and anchovies were just off the charts, 100 parts per million. Shellfish, razor clam, they accumulate for some reason, we don't know why. Dungeness like to feed on razor clams, so they were at extremely high levels.

Just in Washington State alone, $7 million loss to the state. Recreationally, sardine and anchovies, there was a health advisory because of the extremely high levels.

This is a sea lion with seizures that is on the Washington coast, first time ever that it was observed on the Washington coast. Usually, it happens in California during an event, and then the impact to the crab fishermen was just huge.

As Mike has already referred to, this was the first razor clam harvest closure in nine years. This is just a picture from a website.

This is time, cells on the left, the toxin on the right. 2005, a typical year. I just want to note that 2005 wasn't so typical for salmon on the West Coast. There was a total collapse that year because the ocean was El Nino like, it wasn't an actual El Nino.

You can see bloom, sort of early May, and as Mike referred to, that line there is the 20 part per million Department of Health -- public health advisory or limit. If you exceed that, it's not deemed safe. You can see there was a bloom but it just got to the 20 parts per million. I don't think there was a closure. It went down. You can do this again where you get a bloom in the fall.

Then you will see for 2015, same site, cells, per liter, 2 million cells per liter. You can see the domoic acid levels reached over 100 parts per million, 5 times the limit, and then in razor clam, and you have the other bloom.

MS. YOCHEM: In earlier years, the correlation, I don't think, was quite this tight

with the bloom, with the domoic acid and --

DR. STEIN: Right, very good question. Just because you get a bloom doesn't mean you will have toxicity. There is more than one Pseudo-nitzschia species, some are more toxic than others, and conditions make for toxicity, and we don't fully understand the full mechanisms, but some are more toxic than others.

MR. AMES: Are you anticipating this coming up?

DR. STEIN: We are in an El Nino year. If my folks were to project, this is more of a projection, we could have another bloom. We go out on the Shamata in a few weeks and start to collect samples. There is a concern.

MS. HAMILTON: I thought I read that the El Nino was declining --

DR. STEIN: It is, that is the tropical Pacific, it still takes a while for the water, the El Nino water to get here, so the El Nino arrived on the Oregon coast just a few weeks ago, in other words, pressure, water, and lower nutrients. It

just got here.

MR. SHELLEY: Is this temperature driven, the blooms, or not?

DR. STEIN: I will show you a slide. (Laughter) Yes, I'm sure it's related. It is a key factor. There is some other work that Stephanie has done. She is pretty good with big data. She has developed what is called the "HAVEWOO," "have window of opportunity," which is related to temperature, sunlight, and Puget Sound, for example, river outflows, but yes, higher temperature, you are going to have a bigger window of opportunity.

Trying to speak again to some of the impacts and resiliency. For our tribal co-managers and who we have a trust responsibility for within Fisheries Service, that clam hungry, greater clams are just intimately part of their culture and needs. The point I want to make here is that they barely avoided a recall of razor clams this year.

The bloom happened. They harvested

their clams on May 5. If we had been off by two days, they would have never had a harvest. The point here, if we to that depressed community, they have the school dig, so they do the dig, they use that, sell the clams, and use that to buy clothes, books, things for their kids. With three days, they would have missed that opportunity. The estimate from one of our colleagues is that it was a $2 million loss. That is about 2,500 people that are affected.

From this early warning context, sort of where we are today, we are sort of behind the curve. We routine sample sort of right near the peak, you get it to the lab, you do the testing, then your opportunity for doing anything is behind the curve, well over the top, it's happened, you're in it, done. You can do some things, but your opportunities are pretty limited.

The idea is getting ahead of the curve. That's where the lab and can and everything comes in. The point is get out there, if you can find the right place, take the sample, analyze the

sample, and in real time, and then you are ahead of the point of where you should focus your sampling, let's say on the coast, and you're ahead of it as to getting testing information, and you have more opportunity to say geez, we're not quite there yet but we better have that harvest occur earlier.

In the box here, this is the economic value of an early warning, so it is estimated in this study, it is actually done in the Gulf of Maine, I believe -- by those altered decisions about when to harvest or what to close, like time period closures, you could gain, the economic benefit would be up to $3 million, so not insignificant.

We're close to that, to be able to link the physical and biological oceanography with the study of what I call the ecotoxicology, and a bit of luck, so to speak, as to how these HABs are initiated and propagated.

This was a step forward. This is actually doing beach monitoring. The cells still

have to reach the beach, but you have trained individuals that live on the coast to go take the sample, bring it back, they look in the microscope, they have been trained how to detect and identify Pseudo-nitzschia.

We have a simple test. They can then look at sea water and clams, and if they don't like it, they can decide to send the clams to Washington Department of Health and get further testing and get a few days ahead.

This is called ORHAB, Olympic Region Harmful Algal Blooms. I don't know if we have had the conversation here about research to operations in the Valley of Death, getting from research to operations. Here's an example where that actually happened. The reason it happened is that some enlightened people in the Fish and Wildlife Commission for Washington saw the value of this and put a $1 fee on the recreational fishing license, and for that $1, it helps us quote this on an annual basis.

MR. SHELLEY: That is ongoing now?

DR. STEIN: That's ongoing. Vera, my colleague, gets real credit for bringing this together.

MS. HAMILTON: It's the only fee that went through.

DR. STEIN: It works quite well.

MR. SHELLEY: What is the budget for that?

DR. STEIN: That's a really good question.

MS. HAMILTON: Is it all licenses or just on top of shellfish?

DR. STEIN: Just shellfish, not all licenses. It's pretty low tech, buy a microscope, go pick a sample. Obviously, Washington Department of Health has their task to test these. Juan de Fuca eddy is the initiation site, that is where these cells kind of thrive, and then what happens is they peel off and come to shore.

Here's the lab in the can. The environmental sample processor, developed by Chris Scholin, from Monterey Bay Aquarium Research

Institute. It's gone commercial. This is about a foot and a half in diameter, about three feet tall. The next generation is going to be a lot smaller. It's automated. It does chemistry in a can, basically. It can deliver near real time data. If you can put it in the right place, you can get an early warning.

After years of research, which I'll show, we are going to deploy it off the West Coast in a month. That's why Stephanie isn't here. It is going to be 18 meters below the water on this buoy called NEMO, which does a number of other things. It will then take samples and transmit them to shore.

It takes the sample, it processes the sample, which I'll show you, it sends it to shore, so folks sitting at the Northwest Center in Seattle will get the data, process the data, check it out, and then can send it to others.

You could go out and do this on boat, collect a sample, get the sample to the lab to do the chemistry, and that is still 2 to 3 days.

This is the chemistry. These lighter spots, these are controls. These tell us that the chemistry worked. This actually is a sample on our first deployment. You can put it on a dock, you can put it on a buoy, there are a number of ways.

It actually saw fairly high levels of Heterosigma, I spoke to that. It was approaching a level that aquaculturists get concerned, at about 100,000, they start to get concerned about the safety, potential fish kills, you can see it was approaching that. It's hard to see, but there was some Pseudo-nitzschia and a little bit of Alexandrium. More than one species, identify it to species, and the QA part of it is those multiple dots are all the same, the same chemistry, and the idea is to make sure everything is working well.

If you tended to see some bright, some not so bright, you would start to question things. It also detects the toxin itself at the same time and transmits that information.

Paul in his budget presentation discussed the partnership with NOS and a partnership between National Marine Fisheries Service and NOS through the IOOS, Integrated Ocean Observing System Program. They helped us provide/purchase ESP and are helping with this deployment. There are clearly a lot of people involved.

The point of this slide, and I won't go through it in detail, it is just to say this didn't happen overnight. Just for the ESP, it was over 10 years of work to understand the biological oceanography. It's been over 5 years just to reach this point to deploy it.

We are done with the initial pilot deployment in Puget Sound, and that worked great, so we think it should work fine.

We have ESP, they had names. ESP Friday, the first ESP was deployed in Friday Harbor, and then the next one is called ESP Eddy because of Juan de Fuca Eddy is where we think the cells come from. NEMO is that star, and the point

here is that during the summer, during good weather, you have to have a bloom but it stays offshore, so it spins out of the Eddy, starts to travel down because of currents, and just a thought, and you don't have issues onshore.

During summer/fall when you start to get some wind storms and because of the nature of those storms, they can spin off and get blown to shore. If the Columbia River plume is large and going more in this direction, it can actually hold it off the coast, sort of a barrier, fresh water barrier. There are a lot of dynamics here. Heceta Bank down south, another area where blooms can spin off of.

This was the foundational science about the mechanism that allowed us to figure out where can we put this thing. In May, they are going to deploy it, have it do the chemistry, do the analysis three times a week, transmit it to shore.

If you remember the slide I showed you with the levels, that early May sort of bloom, that's why it is being deployed in May, and then

you can have a bloom in late summer/early fall, again, we hope to deploy it then as well.

We are working with NANOOS, the Northwest Association of Networked Ocean Observing Systems, up in Washington, off the Washington coast. They have a very strong visualization system on the Web and we use that to host the data. That's not everything. The data itself is not the thing. Developed through what is called the Pacific Northwest HAB Bulletin, you can see CDC on this, the point is you bring it altogether, and you have a symbol whether there is an alert or not.

This is more for the health officials, research managers versus the public. They use this information to make their decision. It is their call. This is again we are trying to keep this going through the MERHAB Program.

I should point out a bit of a pitch, I guess, but the research that allowed us to figure out the mechanism, test, this bulletin, was in large part funded by the Oceans and Human Health

Initiative, which had funds appropriated over the years and no longer is appropriated. The Act is still on the books.

We have done things in the ocean, and having done that, what is the ocean doing to us.

MR. SHELLEY: That was a NOAA funded program?

DR. STEIN: Yes. There were others involved, NSF later put in some funds for a while as well.

SPEAKER: But there's no harmful algal bloom effort (Inaudible) really is the major output of that poll in our focus area.

DR. STEIN: A lot of effort to expand it, never got traction. Part of the issue, coincidentally, taking it forward was nobody thought human health was in NOAA's mission. (Laughter) Also, this looks like water quality kind of stuff, that sounds like EPA.

MR. SHELLEY: Were there other Federal partners?

DR. STEIN: On this?

MR. SHELLEY: NIH or FDA?

DR. STEIN: NIH or --

MS. BRANDON: I think both, actually.

DR. STEIN: They helped with some research, in- house and competitive. They have a bulletin in Great Lakes just put into place.

MS. LUKENS: Sorry if I missed it, how long can you deploy that instrument? What is the maintenance like on that and how often do you have to go out and take care of it?

DR. STEIN: It is basically out there as long as the batteries last. It is on the scale of weeks to months. If it's idle and you only take a measurement once a week, it can be out longer, a long time.

To kind of wrap this up, here is NOAA's definition of resilient ecosystems, communities, and economies, and there are some highlighted words in there, where I think ESP could help in understanding, helping with informed decisions, and hopefully reduce vulnerability, through the program, through the research, and collaboration,

we have a much better understanding of how climate, ocean acidification, nutrients, and other drivers influence HAB.

I hope I made the point that we can through this kind of information help inform decision making on when to harvest and when not to harvest. I glossed over pretty quickly previous deployment near shellfish beds, on land, so to speak, and we worked with the Lumbee Tribe, we had four of these things out at once. It was quite successful.

I think it can improve communications, and we made the point about real time data dissemination to coastal decision makers. It does reduce the risk of exposure to toxins, and in that regard, also optimize economic opportunities by either influencing area closures or giving a head's up to say I think it is best to harvest now, maybe hold them in a different site, different place.

Here are some sites that I think people just mentioned, where else this is occurring, as

far as these kinds of forecasting. Off the Washington coast, that is the only site on the West Coast at this time. I think I made the point of the socioeconomic impacts are known and are significant.

Our coastal partners and other partners and constituents are really demanding an early warning. They would really like it. And I hope through the ORHAB and MERHAB that show that the partnerships actually exist and that this happened.

So could it improve? I hope I made the point that when it comes to being proactive on shellfish toxicity testing, you can break possibly recalls. The value was reduced because people were not that sure about safety, so they didn't get top dollar for the harvest. If you do integrate that, we think, in there, I hope I made the point that you can minimize economic losses and then obviously protect public health by reducing all this. And it took a village to do all this. (Laughter)

MS. MORRIS: Liz?

MS. HAMILTON: Last year people were really cranky, so even that tiny little increase was tough to get. I would love some information to give back to folks because I kind of had to go to bat for this. Because I didn't know about your early warning benefit. That could be communicated so people know they are really getting a great bargain for their dollar.

DR. STEIN: Right. Thank you.

MS. MORRIS: Julie?

MS. BONNEY: When you say early warning, how much warning are you giving people?

DR. STEIN: That's a fair question. This deployment, we hope, will help us get that, but it's on the order, a few days, and you can see it makes a real difference, a week would be great, depending on sort of ocean conditions, et cetera, it could be longer than that. It could be the Columbia River pool is up, we expect that to relax, so be aware, you know, a couple of weeks, it could get pushed to shore, or it could be a

little longer if you link it with the weather service in predicting storms.

MS. MORRIS: Peter Moore?

MR. MOORE: One of those last slides that showed OA. You put an OA center on this thing?

DR. STEIN: Yes. Well, not on the ESP, not on the robot, but on NEMO, I'm pretty sure they have an OA sensor.

MR. MOORE: I see.

DR. STEIN: Ocean acidification sensors.

MS. MORRIS: Bob?

MR. RHEAULT: It's great that we have another tool in the box. The Interstate Shellfish Center Fishing Commission has recently approved a bunch of ELIZA tests for rapid analysis of shellfish samples, so we are able to speed up the analysis rather than injecting mice and waiting for them to succumb.

I just would really like everyone to be aware that if you are ever in a position to communicate with the press, your messaging has a

tremendous economic impact on this subject especially.

One research in the Northeast Fisheries Science Center came out a few years ago and made a prediction about an imminent algal bloom that never appeared. It did have impacts on our markets. At the same time, when you get a big bloom, I'll spend most of my life on the phone talking to the press, and I'll try to convince them that all of the shellfish that is on the market is currently safe for consumption, because it has all been tested and the stuff that's impacted is not going to the marketplace. I try to extract from the reporter some sort of a promise they will read with that and they never do (Laughter).

For periods of several months, we couldn't sell shellfish in Boston a few years ago, even though all the product that we were trying to sell was perfectly safe, but the press was leading with Red Tide, but we have not had illnesses led to commercially harvested shellfish in this nation

for decades, and I think that is a very important message if you are ever in a position talking to the press, the economic impacts of your message are very critical.

MS. MORRIS: Mike?

MR. OKONIEWSKI: I just second what Bob said. We went through that same kind of dance with the outbreak in the Dungeness crab. I helped write a few things or at least fashioned those. We did a pretty good effort. It was a coast-wide effort, kind of a community effort, I guess. They just want to take the bad news and run with that, and they were pretty good at it. When we started bringing in crabs from the native fishery, which was clean, right away it was like well, the crab is all poison.

The idea being there is a screening mechanism so it doesn't go beyond the toxic levels where they are screened and it's not allowed into the marketplace. We don't want to damage our own markets or have some kind of disaster happen ourselves, as well as the regulatory side that

enforces it.

It's a pretty good screening process but a lot of your points are right on.

DR. STEIN: Related to that, that's the bulletin, it does not make a call. That is for the Department of Health, take that information, they need to synthesize that, they need to make the call, we shouldn't be making the call, and we wouldn't. We will tell them about what's going on, so just avoid that. If that false warning was false/positive, it could be devastating.

SPEAKER: We're having a Dungeness crab tri- state meeting in a couple of weeks, and we are pulling in all the health departments from each of the states to sit down and make sure we are all coordinated.

MS. MORRIS: John, it seemed like from your presentation, and maybe I was misreading it, but that there might be the potential if you can forecast this to allow a harvest to take place prior to the bloom. I can see how that would work with razor clams, but what about some fish stock

that might be impacted by harmful algal blooms? Has anybody talked about a mechanism where the season on that stock is closed but about to open, you would open it early and people could harvest it before it became toxic?

DR. STEIN: If you think about sardines and anchovies, they are so migratory, I'm not sure. A few years ago, we had a really pretty large bloom that never came ashore, but was out there, so they would be feeding on it. That's taking it to a whole other level. You need a broader monitoring scheme, I think.

MR. RHEAULT: In aquaculture, it's a little different. In Korea, where they cook with indium blooms, it will cause mass fish kills, they will harvest if they see the bloom coming.

DR. STEIN: Yes, they will take action.

MS. MORRIS: Any other questions or comments?

MS. HAMILTON: Depressingly fascinating.

DR. STEIN: I think the value is in the past before the ORHAB program, they had to be

highly conservative, so if they saw one clam -- to go back to the time period, closures would be more surgical, if you will, and I think that is a key part, I think that advanced warning, early warning, can allow shellfish farmers and others to make decisions.

MR. RHEAULT: It's pretty clear that these blooms are increasing in frequency around the world. It would be great if we knew why, because that might give us a tool to help control it. The Holy Grail is can we actually control the bloom.

There is some fascinating research going on in South Korea where they are putting Dolomite out to aggregate the cells and sink it to the bottom. If there are some sort of ways to control the bloom, that would be an amazing tool.

MS. MORRIS: I could talk about what we are learning about red tide in the Gulf of Mexico, and I think they are using a lot of aerial imaging, and they are actually observing it in order to figure out where it is originating and

how it is moving.

DR. STEIN: That's a good point, thank you. The Pseudo-nitzschia --

MS. MORRIS: You can't see it.

DR. STEIN: You can't see it. Plus, it's pretty cloudy. Sometimes satellite data is pretty sparse. They can do satellite-based forecasting.

MS. MORRIS: For Karenia, it's a human respiratory irritant, when it comes to the beaches and the shore, and the local tourism doesn't want anyone to broadcast that nationally because they may get lots of cancellations of hotel rooms and stuff like that.

DR. STEIN: There is a lot of work. That is where we think we have an idea about the mechanism, so again it is a dress rehearsal for the future, not necessarily this extent.

MS. MORRIS: The next thing on the agenda is a public comment period, so I'm going to ask if there is anyone from the public in the room that would like to address the committee.

(No response)

MS. MORRIS: Here's an update from Heidi about this evening's plan. Forget anything you ever heard about $15 to pay for the bus. That's all been taken care of generously by negotiations with the General Counsel's Office and the purchasing office of NOAA. That cost will be covered by the agency.

If you would like to voluntarily contribute $5 or $10 to help defray the cost of the booze for tonight, you are welcome to do that, but it looks like Liz is going to decline.

MS. HAMILTON: No, some of it is being donated.

MS. MORRIS: Let me ask once again if anyone is here to provide public comment.

(No response)

MS. MORRIS: We will break for lunch, and expect everybody to be back by 1:30.

(Whereupon, at 11:58 a.m., a luncheon recess was taken.)

A F T E R N O O N S E S S I O N

(1:30 p.m.)

MS. MORRIS: Let's begin. I have one logistical announcement before we start with Katherine's presentation. Is anyone planning to drive to Pacific Seafoods this afternoon instead of going on the bus? If you are, check with Heidi, she will give you a badge to enter Pacific Seafoods, but it sounds like there is not.

MS. HAMILTON: Speaking of badges, for my better half at home who hasn't had the pleasure of knowing all of you, my staff, and a few other visitors that are joining us, if you wear a name tag, that would be very nice.

MS. MORRIS: Okay. Katherine Cheney, we are ready and eager to hear what you have to share with us.

MS. CHENEY: Thank you so much for having me. I work for the West Coast Region in the Communications and External Affairs Branch. I was asked to talk to you guys about our outreach campaigns. We do a lot.

What I tried to do was pick three very different ones with very different focuses and very different audiences and strategies. I picked three. For each one, I'll talk a little bit about the challenge and the audiences and the approach we took.

I'd like to say first that one of the things we do first is have a very deliberate analytical discussion with our program folks. What is the problem they are trying to solve, what is it they want to have happen, and really go into some audience analysis. For that, we really try to come up with who are we trying to reach, what do they care about so you can speak to them in a meaningful way, what are their values, how do they get their information, and what do we want them to do.

After the audience analysis, we go into a message development exercise, and just to give you an idea how serious this part is, I did an exercise with a number of harbor recovery coordinators up and down the West Coast. They

each have a geographic area, there are about 15 of them. I gave them a chart to fill out about audiences.

I worked with them on the messaging, and it took a good couple of weeks to get through it. It's a very important step, it's very deliberate, and it actually is kind of the favorite part of my job. I get to work with the program people hand in hand to problem solve together. I find that the program people get really excited about it, it isn't something they normally do, and it helps them think differently about their work and their audiences as well.

I picked three campaigns. I'm going to start first with dynamic oceans. I think you guys mentioned this a couple of times yesterday. There are a lot of unusual things happening in the ocean, unusual observations of species, warmer temperatures, people trying to figure out what is going on, is this an anomaly, is this normal. There is always different impacts in different places.

For NOAA, not just NOAA Fisheries, there are many different entities doing research up and down the West Coast. This includes not only the science centers, John's center in the Northwest, the Southwest, the Alaska Fisheries Science Center, quite a lot of sea lion research. We have the Weather Service and we have OAR.

The other challenge with this situation is it is very data heavy, lots of modeling, lots of statistics, some of it also is centered on a specific location that people are wondering how this is applied more broadly.

There is a challenge in how to speak about this. We really wanted to connect it with people's daily lives. There are fishermen, the public, a whole host of audiences who are really fascinated with what's going on, but really trying to understand as well.

For our audiences for this campaign, we identified just a couple, the general public, as I talked about, it has really forced us to use quite a long reach and try to explain the story. Ocean

users, different fisheries, wildlife enthusiasts, people who are watching and enjoying the seals and sea lions up and down the coast, wondering why they are starving in Southern California and why they are showing up in crazy numbers in the North. I think you guys heard some of that yesterday, too.

Then for the media, because the media is trying to tell the story as well, and they are calling all around and trying to figure out who to talk to.

Here's what we did. We decided we were going to tell one cohesive story up and down the coast. We reached out to all of our various NOAA entities and experts within each one of those. We decided we were going to do a series of Web type stories, Web type featured stories, highlighted on our home page, but they are long enough and provide enough space that we could integrate graphs, charts, technical information, and explain them. We also developed a monthly newsletter on updates.

Our first story, it was actually quite a challenge. We had probably 30 or 40 people for each one of these stories, so we needed to coordinate comments, get reviews, changes, so there was a good amount of patience and persistence around this effort, but when it was done, we got 40,000 -- that was about average for the whole series.

Also for the media, because we made so many contacts with them, they really turned and looked to NOAA as an expert on what was happening on the West Coast. We had coverage and calls from CNN, National Geographic, Reuters, people from all over the world came to us as experts.

I would say also all the contacts we made within this area of agencies really created a new network for us on how to move forward together.

That was dynamic oceans. These are a couple other of our stories, the sea turtles in these warming waters and the sea lion pups.

Now, a completely different one. On the

West Coast, we have a lot of salmon, as you guys know, and we really focused in on toxics, and in order to address toxics, you need to address individual behavior. How do you reach people, how do you reach individuals and help them change their behavior, make them want to change their behavior and be part of something bigger, and how do you relay the technical information in a way that they care about it.

There was some really significant research from John's awesome agency, from Matt Schultz, about the impact of copper on salmon, for example. It was significant enough that they actually changed the laws in Washington State based on this research.

We took advantage of that science paper, and thought how better to tell the story than with art. What we did, we targeted with this campaign individuals, millennials and Gen-X, and I am going to come back to this slide. What we did was we partnered with our college here in Portland, Pacific Northwest College of Art, and they have a

very strong philosophy there about art being a part of social change, and really inspire their students to be part of something bigger.

Every year, we go to them with a problem. Last year, it was toxic. All we give the art students is our messages, our problem, and the audience, we said, okay, give us what you have. They come back with various proposals. We get some wild stuff that is so creative that it is just really inspiring. We take a handful, and we work with them throughout the year to produce some products.

They have to have a call to action message, really focused on the individual. Last year on this toxic piece, one of the students developed a salmon mural with a variety of inputs, topics, and the other photo's here is an award he won, he won a $10,000 award, and that mural is up on the County Commission Building.

We partnered with local school boards to help paint the mural, and we are now working on that in Long Beach, Sacramento, Portland and

Seattle.

Another student last year, this is "Keep Salmons Off Drugs," which was a very timely piece because another science paper this year was talking about the various toxics and pharmaceuticals that ended up in salmon in Puget Sound. You might have seen --

DR. STEIN: You know you have made it when your research becomes a skit. It's hilarious. The one don't ask what a salmon can do for you.

MS. CHENEY: These actually went viral, I couldn't believe it. We got them out on social media, and people requested them, agencies requested them, we updated the information depending on locations, as to where you could safely dispose of your pharmaceuticals. They went all over, the University of Oregon in Eugene. So, they are continuing to live on.

We had a lot of issues in Southern California where people were going out power boarding and kayaking, taking their cameras and

putting them up on social media, like this was the coolest thing ever, really interfering with the analog. Our challenge this year was safe whale viewing. Micha came to talk to the students about the Makah whale time table. We are doing a lot of that kind of work with them. We will see what we get back this year.

That is the campaign on individuals that we did. Finally, fish passage. Fish passage is absolutely part of what we do on the West Coast. We have salmon, we have to get the juveniles down safely to the ocean, we have to get the adults back. We have a lot of systems and culverts, all sorts of things.

This is a very different campaign, very tricky, a lot of technology, complicated information. It is also highly emotionally charged. Some people think why don't you just take them out and you wouldn't have any passage problems. It is critical for salmon recovery and it is different at every location. There is no cookie cutter here. Every situation had its own

geographic and biological and all sorts of variations. You want to promote technology while being very aware of other considerations.

For this one, we had a whole series of audiences. We targeted fish passage engineers because our expertise on the West Coast is internationally recognized. Our guys go abroad, teach internationally. People come here to learn about our stuff. Nowhere in the world is there fish passage engineering like we have on the West Coast.

Our salmon recovery partners, they really want to know how we are going to get these guys to recovery, how does fish passage and some of that engineering you are using fit into the recovery picture.

When you are opening up access, they want to see the fish, but they are an important audience as well. NGOs, some of our critics as well as some of our supporters really want to make sure our investments are paying off.

What we did, first we did a series of

infographics, again. The fish passage technology is under water. You really can't see it and appreciate it and understand it unless you have a visual. We did a series of infographics as well as in a brochure. We did a series of Web type stories where we highlighted case studies, not just on one particular access, we tried to do before, during, and after, come along and ride with us, here is what we are trying to do, here is what the designs are, here is what it looks like during construction, and here is what it looks like afterwards.

We followed up, one, two, three years later with a number of situations, how are the fish doing, are they in the right locations, are they coming back, and follow up on that, so people can really focus in on the results.

Finally, there is an event called World Fish Migration Day for fish passage engineers all over the world. It is coming up May 21, it is every two years. This provided for us an international platform for us to showcase our case

studies, showcase our engineering, and last time, in 2014, one of our case studies brought 86,000 views to our site, which was pretty cool. This year, May 21, you will have to check out the NOAA Fisheries page.

The one million smolts and the picture in the middle is from Baker, which is a project in Northern Washington, with Puget Sound Energy. The first year, they had a million smolts, the second year, about 1.5 million. We will see what year three does. We want to share that with people.

Another one was Umpqua in Oregon, a very narrow river, and for that project, they needed helicopters, it was so narrow. Again, the before, during, and after.

The other thing I can add to this, we are working on it now, is a series of frequently asked questions because some of our partners and strategies would like to look at some of the fish passage technology that we are doing in the Northwest, what precautions do we have. We are trying to share those lessons with our partners in

California in the Northwest. We have a pretty significant piece coming up.

So, they are all very different.

MS. MORRIS: Questions and comments?

(No response)

MS. SOBECK: Thank you, Katherine. I wasn't aware of all these. It is kind of a bigger commitment of NOAA Fisheries to build up our communications shop, and I think maybe there is a little bit of reluctance, maybe to hire another scientist versus a communicator, but I think these are great examples of if nobody knows what we are doing and they don't know why we are doing it and they don't know how we are doing it, nobody is going to really appreciate and support our work.

I hope everybody thinks, I know I do, that it is money well spent and communications is partly about responding to the media and reporters and press releases, but the days of just putting out a press release about some finished product are kind of over, and having this much more comprehensive and dynamic and platform creative

kind of approach, you know, government doesn't always do it very well, and we are still learning.

MS. MORRIS: Erika?

MS. FELLER: For example, with the salmon, "Keep Salmon Off Drugs" campaign, do you guys have any kind of mechanisms for like what was the impact of that campaign on people's drug disposal habits? Were they making different choices? Did you see any kind of response in the water?

MS. CHENEY: That would be awesome if we could track like that, that would be very hard to do.

DR. STEIN: It is too soon to tell, but what we will try to do is work with the Puget Sound Partnership, which has an outreach campaign as well to try to do that. Because that's one of those, right, don't take your bottle and don't do this, dispose of it properly and probably, you know, the one action that would make some real difference.

MS. CHENEY: One thing we do track very

actively is how many people have actually either viewed or read or investigated our products, how much awareness have they increased. And that is one thing we can track.

MS. FELLER: So that kind of gets to my second question. You talked about impressions, eyeballs on pages is something that you can track, have you thought about creating any kind of method -- I mean, there's eyeballs on pages and then there's engagement, like people actually taking that information and doing something, like putting your name on a list, signing up for a newsletter, signing on to something or something along those lines? Have you guys explored any options for measuring engagement and action or putting things out there and getting the public to respond and provide input or engage with the agency?

MS. CHENEY: We have. I would say those types of things are more related to an actual engagement with a particular process. For example, the partnership that we spoke about yesterday, that level of engagement. For example,

if you are involved in the development of a recovery plan, and we are putting out products and we want people to provide comments back to us or engaging with us or coming to a workshop, yes, we do track that very carefully.

That is a little different, I would call that more an engagement, education and awareness, but that is a really good point.

MS. MORRIS: Columbus?

MR. BROWN: I just thought about it. The pharmaceutical industry, is that someone you are reaching out to, the medical folks, insurances, pharmacies?

MS. CHENEY: You know, we would love to be able to do that. We don't necessarily have the resources to be able to go that far. We are probably doing about half a dozen or more of these, but I don't know, John, what do you think on the science level?

DR. STEIN: The question brought to mind the work that we have done on current use of pesticides on juvenile salmon. The response was

to challenge the science in a big way, but I thought the key point was we did learn that one of the initial papers was read in the board room of Syngenta when it came out.

MR. BROWN: Just a thought, the pharmaceutical industry, they will go to the doctor's office and give them all kinds of samples of this and that. If you were able to go back and see if there was an increase in people taking -- it would give you an indication that the word is getting out.

MS. CHENEY: One thing our artist is going to be doing is checking in with the disposal centers, and she is going to do that every six months to find if there has been an uptick.

MS. MORRIS: Bob?

MR. RHEAULT: I was struck by the work that went into identifying the target audience. How do you identify the best method to reach your target audience?

MS. CHENEY: That varies. If it's an audience we're familiar with we'll guess. Often

we'll have a conversation with them and reach out to them directly and say, you know, we'd like to share some information with you, we would like to work together with you on this. How do you get your information and would this work for you?

In some cases, like with the whale (phonetic) hearing, (inaudible) trying to get to in Southern California, it's pretty heavily social media, because that's where they are, they're sharing the information on a moment's notice, so we've got to be right there where they are. A lot of it is social media these days.

MS. MORRIS: Heidi?

MS. LOVETT: When you showed the page that had the Facebook snapshot, the Facebook (Inaudible). And I know I sometimes see the things from the headquarters region. Is there a sharing across?

MS. CHENEY: There is a lot of sharing. We share all our social media with the two centers, the one in La Jolla and John's, for the reason that we try to tell one story. We also try

when we talk about the management of a particular issue, we always try to lead with the science. What is the science telling us? And use that as our guide. So we've got science management, science managers, so we have one West Coast. And that's what other regions do, but there is a lot of sharing back and forth at headquarters. We all have sort of different followers, so we can repurpose that and reach a way broader audience.

Surprisingly, through the World Fish Migration Day, we have quite a cadre of followers from China, India, Japan, all over the world, Iran.

MS. MORRIS: Peter Moore?

MR. MOORE: Is the Migration Day specific to fish passages or are you also using the telemetry information?

MS. CHENEY: It is pretty broad. We are focusing this year on some of our fish passage, and actually dam removals. It is really a wide range. What they do there is World Fish Migration Day itself is educational, and hey start over in

Australia and New Zealand and go all around the world and end in Hawaii, and they hook up all these events live through social media platforms.

MS. MORRIS: Thank you, Katherine. Thank you so much. I want to build a bridge between these resiliency presentations we have had today and the committees and working groups that are going to meet later in the afternoon.

Before I do that, I'd like to say farewell to Eileen, thank you so much for spending a day and a half with us. Do you have any final words?

MS. SOBECK: No, I apologize for stepping out a little bit earlier and for missing the hospitality that Paul is going to carry to headquarters by Jennifer, but as usual, thank you for inviting me, a real wealth of ideas and knowledge around the table. I always learn things about my own operation that I didn't know, because it is big and vast and decentralized. Thank you again.

When is the next meeting? It is in

D.C.?

SPEAKER: First week of November.

MS. SOBECK: That should be an exciting week. (Laughter) I think the elections are quite late this year.

MS. MORRIS: It will be an exciting week. Thanks again for all your time and safe travels back home, and we will see you all in November. (Applause)

MS. CHENEY: One thing I can offer, Julie, is we have like some charts and some of those exercises we do for audiences and messaging. We would be happy to share that with you, it might be helpful.

MS. MORRIS: You would share like a Web link or something? Documents?

MS. CHENEY: They are actually little packets, help identify audiences, messaging.

MS. MORRIS: Thank you, Katherine. Are you going to be able to stay for the next hour or are you heading back?

MS. CHENEY: Just for a little bit and

then heading out.

MS. MORRIS: Okay. In the next hour and then the hour following that, we have three of our coastal resiliency ad hoc working groups who are going to meet. One of them is communications, and Erika is going to be the task leader for that group discussion this afternoon.

Just to remind you, we came up with these charges and proposed deliverables back at our October meeting, but it's been a long time.

If you haven't been involved in one of these task groups because you are new or because it's been a long time, just to refresh your memory about what these are about, the charge for the communications ad hoc working group is to figure out how to help councils, fishers, communities, and cooperatives use information on past, current, and possible future climate related changes to make decisions and adapt.

The deliverable that this group is working on is a white paper or report that would make recommendations for effective communication

and delivering this information. A lot of it is being produced by the science centers or universities, but to get the information to the right audiences.

Do you want to add anything to that, Erika, about today's discussion?

MS. FELLER: No, there is overlap.

MS. MORRIS: So, you have a tough choice, Task 6 is meeting at the same time, and Task 6 is led by Harlon.

MS. FELLER: Let me fact check. When we provisionally set the schedule there was also a lot of overlap between Julie's committee and Harlon's committee. But now there's less work to be done because we're at a certain point, so it might be fine to have one and then the other.

MS. MORRIS: I'm sorry, explain your suggestion so that we all can understand.

MS. LOVETT: We might be able to reverse the numbers or have people meet at different times to help with it be less overlap.

MS. MORRIS: What is your suggestion for

less overlap?

MS. BONNEY: We had suggested 30 minutes. We have had one telephone conference, and we kind of met for an hour, and at this point, I don't think I've seen the minutes for that meeting. There is a workshop in Washington, D.C. Once we go through the three day workshop, I think it will make our task a lot more focused because that is what the workshop is dedicated to. Once we get the minutes, get the proceedings from the workshop, that will be the time to move forward.

If everybody is okay with that, in terms of that path, we really don't have to meet.

MS. MORRIS: So, the suggestion is that we have two ad hoc working group meetings, not at the same time but in sequence?

MS. LOVETT: That would work. I would want number six to go first because I believe there are some people that are going to be calling in.

MS. MORRIS: Wow, you are way ahead of me on all of this. (Laughter) We are not

building a bridge. Is there any objection to the Task 4, social and economic community impacts' group not having an official meeting today? Any objection to that? Anybody who was really looking forward to that and is going to be heartbroken? You're laughing.

SPEAKER: Maybe because I'm an economist.

(Laughter)

MS. MORRIS: Right, and we invited you to stay so we could talk more with you about these things.

UNIDENIFIED: (Inaudible) and talk with Steve and he can tell me everything I need to know.

MS. MORRIS: Okay. Steve, please stay with us and talk with people about social and economic things today. Let me just remind everybody about the task that we will be talking about first, which is Task 6, evaluate and strengthen tools and strategies for fishery managers, NOAA, fishery management councils, and

other management processes, such as state commissions and secretarial, to consider and respond to climate driven changes in fish stocks and fisheries.

The charge is to identify effective tools and mechanisms that can be used under the MSA, provide for dynamic adaptive management actions. The proposed deliverable is a white paper or report that clarifies challenges, potential approaches and case studies, best practices, and next steps to improve the ability of fisheries management to be nimble, flexible, and adaptive.

Harlon is leading this. I guess we can all stay here. If you are not interested in talking about it, you can go make phone calls or deal with other things that need your attention right now. The next task group will begin at 3:15, and we will talk about communication strategy at that time.

Any questions? Mike?

MR. OKONIEWSKI: Which group is going

first?

MS. MORRIS: We're going to do how to make management more nimble first.

MR. OKONIEWSKI: Which is Harlon's group?

MS. MORRIS: Right.

MR. OKONIEWSKI: I basically need to be out of here no later than 3:15. That would work pretty well, I think.

MS. MORRIS: Harlon, do you want to lead on this? We have had a couple of conference calls.

MR. PEARCE: First thing, I'm kind of hard of hearing, so speak up, please, when we talk.

SPEAKER: One moment. (Dialing phone)

MR. PEARCE: We will call Task 6 to order, and we had two pretty good conference calls, I thought. We got a lot accomplished in those conference calls. We have quite a bit of suggestions to go over and to think about and talk about.

What I want to try to do -- we read the charge already, so I don't have to read the charge to you -- go through the questions that we were asked one at a time. Does everyone have the minutes? Does everyone have what I'm looking at here? Shows you what we came up with in the calls, does everybody have those minutes?

MS. MORRIS: Heidi, does everybody have the minutes from the calls?

MS. LOVETT: I can send it to the group.

MR. PEARCE: Okay. What I'd like to do, if we have the minutes, especially the ones who were on the call, you have 10 or 12 different items under each one of the questions. I'm going to take one question at a time and I'm going to ask you to look at the suggestions, and I want you to come up with your top three.

What I want to try to do is sort of focus this in on what we think is the most -- prioritize the items that we have on this list. We can go over all the items, that's not a problem, but I'm really curious as to what people

think about the suggestions we had for each question, if that makes sense to you.

SPEAKER: We will put it up on the screen.

MR. PEARCE: Oh, good, we will wait for that. That way you can give Paul his marching orders when he goes back home, which one he likes the most.

Question one, what are the challenges that hinder managers responding in a timely manner to a change in a fish stock? The ideas that are mentioned are going to be on the screen. Again, I'm going to read all of them to you, and I would like for you to kind of write down your top three for me, so we can start to prioritize.

One is stock assessments, lack of ability to incorporate climate into stock assessments. Number two, NMFS's approval process, approval of the amendments that we pass. Lack of science on protected resources and climate change. Gaps in river observations in some areas. Need to manage proactively, not reactively, and we need

tools to do this.

Exempted fishing permits, process can take too long. Move to ecosystem-based fisheries management and adaptive management. Uncertainty in the ability to make changes if projections end up being wrong. Not able to respond quickly to new stocks in the area.

Need real time data processing for all sectors, commercial, for hire, and private. Need more cooperative research, data collected with fishermen. Too much concentration on protocol, not doing what is needed for businesses. Plan better for uncertainty as it will only increase with climate change.

I'm not quite sure how I will get this done, but what I will do is I will give you my top three, and then you guys can figure if you are in line with what I'm doing. I'm trying to go down the list.

The ones I like the most is need to manage proactively, not reactively. I think that is a really important statement, to be ahead of

the curve, not behind the curve. Need real time data processing for all sector, commercial, for hire, and private. Need more cooperative research, data collected with fishermen.

Those are the three I pulled very quickly. Let me pick on somebody. Julie, do you have a top three?

(Laughter)

MS. MORRIS: Mine would probably be the exempted fishing permits.

MR. PEARCE: Exempted fishing permits? Okay.

MS. MORRIS: I don't really have a top three, that would be my top one.

MR. PEARCE: Columbus?

MR. BROWN: Mine would be need to manage proactively, not reactively, move to ecosystem-based fisheries management, and real time data processing.

MR. PEARCE: Okay. Ted?

MR. AMES: I'd have to go with move to ecosystem- based fisheries management, because

that is the bottom line in sorting out how to effectively manage fisheries in the first place.

MR. PEARCE: Okay. Any other ones that peak your interest?

MR. AMES: I would have to say perhaps the NMFS approval process. It takes a long time to get changes into the system and then through it.

MR. PEARCE: All right. Peter, you were on the call.

MR. MOORE: Stock assessments, but I would like to incorporate not just climate but real time information. Somehow being able to respond to new stocks moving in. I think that is going to be a state/Federal process, probably. The third was I think the cooperative research piece should be highlighted, it seems to be really working well. It is a way for fine scaling information for fishermen.

MR. RHEAULT: I think really it is the NMFS's process that is hindering our ability to be nimble, and the uncertainty in the science on

ocean acidification and how it is actually going to affect the organisms. I have the feeling it is going to be bad, but the science is not compelling.

SPEAKER: In your region or in general?

MR. RHEAULT: In general. I've looked at science all over the world, I'm still the poster boy for L.A., so I should know. What is up there is lack of science on protected resources and climate change. I'm cherry picking the one climate change that could have a huge impact or maybe not, depending on the science, and the science is really weak.

MR. PEARCE: Gotcha. Erika?

MS. FELLER: My top three would be stock assessments.

MR. PEARCE: Speak up a little bit, please.

MS. FELLER: Stock assessments, lack of science on protected resources and climate change. I am reading these rather broadly as the ability to include climate change -- it was a toss up for

me between sort of the uncertainty and ability to correct. Of course, you correct if you do something wrong. The move to ecosystem-based fisheries management, I didn't pick that because I actually see that as a solution, not a barrier, but I think it is really important.

MR. PEARCE: Give me your three one more time. I didn't hear them all very well.

MS. FELLER: Stock assessments, lack of science for protected resources, and the uncertainty and ability to correct changes if projections end up being wrong.

MR. PEARCE: All right.

MR. MOORE: Can I clarify one thing, Harlon? Number one, do we mean under stock assessments lack of ability to incorporate climate into stock assessments or ecosystem stock assessments?

MR. PEARCE: If you want to --

MR. MOORE: I think that is what we really mean, what is the climate doing to the physical and chemical oceanography, right?

MR. PEARCE: Do you want to add ecosystem-based to that?

MR. MOORE: I just want to clarify are we trying to incorporate rain and tornados or are we trying to incorporate what John works on? I think it is the latter, the effect of climate change on the ocean, or whatever you want to call it.

MR. PEARCE: All right. Ted?

MR. AMES: I would like to point out that the stock assessments are a real problem because you're taking every value for a whole region, and climate change is going to occur usually at an interface, and if you don't develop some method for managing it smaller scale or assessment it smaller scale, you are never going to see what's going on. We have that problem right now.

MR. PEARCE: Okay. Michael?

MR. OKONIEWSKI: My number one is too much concentration on protocol. I think that is kind of front and center. Need more cooperative

research, and I would also add to that one a look at cooperative management technique or application. With funding limitations and everything, cooperative management, and not just talking states, call it collaborative, call it cooperative, whatever the term is, I'm talking about stakeholders. The authorities reside within NMFS and councils, but there are things I think that could be done outside of the norm that industry perhaps and with the stakeholders in general could be involved in. I think it would cut costs, gain efficiencies, coop's themselves, such that we have in Alaska, I think there is some proof for that. Julie might agree with that. That would be my number two.

I think also not to lose the research, cooperative research, for the same reasons, there is only so much funding to go around, there is a lot more tasks than there were even 10 years ago, so if we're going to get a pile of money, which I don't think is going to happen, I think we are going to have to bring stakeholders into the

picture more, and how we do that, it has to be defensible, but nonetheless, I think it is something to look at.

The last one would be probably be stock assessments themselves, I think that is key to how we manage the fisheries and without good data, we can't really -- the uncertainty level goes up and everything else falls apart.

MR. PEARCE: Gotcha. John?

MR. CORBIN: I'm going to pass since I didn't participate in the call.

MR. PEARCE: I would really like your opinion. Do you have any opinions with what is on the board?

MR. CORBIN: Stock and management is being covered by another task, so what I would say is the scientific basis to use stock assessment as an effective tool to manage fisheries.

MR. PEARCE: Okay. Rai? Can I call you Rai? Raimundo is too long for me. (Laughter)

MR. ESPINOZA: No, that works. From my part of the world, my point of view, what I see as

critical is more collaborative research. I think that is also taking advantage of the economic situations in some parts of the world. I think it is also important that be considered for future research.

Also, the ecosystem-based fisheries management, and I have one question, when you say real time data, what specifically are you talking about? Is this addressing also reporting --

MR. PEARCE: Yes, all of the above.

MR. ESPINOZA: I think that is what I would mention, the real time and data processing, just because if you are going to have stock assessments, there is a precursor, I think we would be able to rank these, which actions would lead to the others, so I think that is one of the ones that would really improve collaborative research, it could provide additional information for improvement of stock assessments, so that is another one that I think should be there.

MR. PEARCE: Terri?

MS. BEIDEMAN: Off the cuff, I have to

say uncertainty in the ability to correct changes, if projections end up being wrong, and that has to do with not being nimble. Cooperative research, of course, is key. Fishermen are out there fishing and most of them are happy to participate, at least usually. I think we do have to try to begin to manage proactively, not reactively. I'm not sure exactly how to do that. That is what I think we are trying to do here.

MR. PEARCE: Peter, any ideas?

MR. SHELLEY: On this list, need to manage proactively and the tools for doing that, and moving to ecosystem-based fisheries management and adaptive management will bring in a lot of these other structural issues about how fishermen organize themselves. For me, the most important thought about the challenges is I think we are really data starved in terms of understanding how climate change is actually affecting stocks.

The example I would give is Atlantic cod, where we have the fastest heating bodies of water, apparently. We have theoretically a heat

intolerant or cold water loving fish, and we have two sets of scientists right now fighting it out in Science Magazine, whether or not climate change is affecting productivity of cod or not. They have whale cod showing up up in New Jersey, which is not the way the studies say they should be moving.

I think the absence of real time catch data, study fleets, background reference sites, and observation programs is going to kill us. We are just going to be running around pretending to respond, sort of using our historical experience to anticipate a future that none of us have ever seen.

MR. PEARCE: Okay. That narrowed it down a little bit for us. We have a clear winner, need more cooperative research. It is clear we have a lot of people who agreed upon that right off the bat. Then you have stock assessments using ecosystems, along with -- what is the next one -- lack of science on protected resources and climate change. Right behind it you have -- no,

proactive versus reactive was right in line with those other two. Real time data.

You have four or five that at least we have trimmed it down to. Stock assessments, ecosystem, lack of science on protected resources and climate change, manage proactively, not reactively, real time data, cooperative management research, and some addition to stock assessment from John and more data from Peter.

We have narrowed it down to about three or four that we have kind of looked at that we all think would be more appropriate to send back to NMFS and let them know these are the things at least to this question that we liked. There are other things on here that we were looking at as well. Those are the top ones. You got that? Okay. Any comments on that? Ted, any comments before we move to the next question, or do you want to discuss each one independently?

MS. MORRIS: Let's move on to question two.

MR. PEARCE: Okay. Julie is moving me

along, so we're moving. The chairman just kicked me. (Laughter)

Question two. We are going to do the same thing. What prevents fishermen from responding to a change in a timely manner. The ideas, one, easier to shut down fisheries than open them. Two, current system, fishermen take on the risk, it is hard to be proactive, take initiative, when they do not know what management will do.

Three, with cooperative research, science is not clear on how they will use the data, limiting participation. Four, management has locked into certain approaches and fishermen have invested in certain types of fleets making it hard to adjust to change. Five, regulations can prevent adaptation, and examples are closures that may not still be applicable today, bycatch hard caps, so they are not just for abundance, limited access permits, catch year programs, allocations.

Next, need framework within NMFS for bringing forward new ideas on data collection,

community-based monitoring. NMFS needs to build off successes, collaboration. Problems, lack of trust, both ways, issues with science, issues with compliance. Need better understanding about the viability of stocks in a new area, productivity, appropriate catch amounts, et cetera.

Lack of fishermen understanding on how climate change impacts them. Need better outreach to fishermen about possible future changes, what species might move into and out of an area, how quotas may be affected. They need someone to explain options for responding, adapting.

I will start with you first, Erika, and then go back the other way.

MS. FELLER: I don't know yet.

(Laughter)

MR. PEARCE: Spoken just like a woman. (Laughter) I didn't mean that, just trying to make a joke. I try to make fun of stuff and that was the wrong fun to make, I'm sorry. (Laughter) Ray did it. (Laughter) Ted, we will start with you.

MR. AMES: Sounds good. (Laughter) My

first choice would be management has locked into certain approaches and fishermen have invested in certain types of fleets, making it harder to adjust. This is compounded by their having access to only a limited number of species under the current system, which means if you change, you may put a whole fleet out of business. That needs to be an add on.

The second one would be problem is lack of trust, both ways, issues with science and issues with compliance. We ended up with the wrong kind of relationship between commercial fishermen and NOAA. We need somehow to get on the same side.

My third choice was the last one, we need better outreach to fishermen about possible future changes vis-à- vis what species might move in or out of an area, what that might mean, how quotas might be accessed or affected, and so on. There is a whole list you can put in that. They need someone to help explain options for responding and adapting.

MR. PEARCE: I've got it.

MR. AMES: Those were really good options that the group put together.

MR. PEARCE: Gotcha. Columbus?

MR. BROWN: Mine would be management is locked into certain approaches, fishermen have invested in certain types of fleet, making it harder to adjust to change. I'd also add to that and gear, not just the boat, the gear, too, gear types.

Need a framework within NMFS for new ideas on data collection, community-based, and so forth.

SPEAKER: Speak up, please.

MR. BROWN: Need framework within NMFS for new ideas on data collection, community-based, et cetera. My last one was outreach to fishermen about possible future changes, what species might move into and out of an area, what that might mean, how quotas might be affected. They need someone to explain options for responding and adapting.

MR. PEARCE: All right. Julie?

MS. BONNEY: Mine is not really on the list. It is input controls versus output controls. Closure areas, high catch caps, regulations that are hard and fast based on tasks versus giving people flexibility to make changes based on what is actually going on. That would be one, catch, quota system versus limited access.

MR. PEARCE: Young ladies, do you have any comments?

MS. YOCHEM: I didn't participate in these phone calls but I think a couple of things I would mention with regard to management and the fishermen being locked into certain gear types or management approaches, those are difficult to change quickly. I would think the other one would be probably communication, which maybe that is addressed by the last bullet point, clear on what needs to be done and how that might be accomplished. Just those two.

MR. PEARCE: Heather?

MS. BRANDON: I think management is

locked into certain approaches and fishermen invested in fleet and gear, lack of fishermen's understanding of climate change impact, and then better outreach.

MR. PEARCE: Thank you. Peter?

MR. MOORE: Regulations, adaptation, uncertainty, and the management is locked into certain approaches, and I have a third one, at least on the East Coast, this issue of state/Federal jurisdiction over different species without I would say in some cases would be a good system to resolve the migratory aspects of black sea bass moving, or flounders, and that really is a big issue, and it sort of wraps into the other two.

MR. PEARCE: Bob?

MR. RHEAULT: I think the management and the regs are sort of tied, two sides of the same coin. Trust and understanding are also two sides of the same coin. I have a large number in my constituency that don't trust science, don't trust NOAA, don't trust regulators, don't want to believe in climate change, and believe anybody

with a PH.D. Is out there with their hands out. There is a lack of trust and a lack of understanding, hand in hand. They don't want to understand it because they don't trust.

SPEAKER: That's pretty good for a non-lawyer. I'll take his two coins, gives me one more, which I think it is much harder to open new markets and change years of practices. That is a real barrier. That's my interpretation of the first one, that it is hard to open up new markets.

MR. PEARCE: Okay. Terri?

MS. BEIDEMAN: I'm going to see you and raise you (Laughter). I couldn't help it. I won't do that to you. I'm going to say I agree with Bob that the regulations prevent adaptation, for the most part, in many fisheries and in single species management, some folks are boxed or totally into a niche, and they don't have the option to adapt on a seasonal basis to another fishery. It's just not there.

If something happens, like lobsters, they don't have a recourse. Management,

regulations, which came first, the management or the regulations, it's the same. They are locked into certain ways of doing it. I think the last bullet really covers the issue, what needs to be done.

I don't know if people believe it, but I know an awful lot of the fishermen I have talked to can see on the ocean the changes and the compilation of the catch, what they are eating, and a lot of that information.

I don't know, maybe they are in huge denial, but I think they don't know what to do, and for the most part the government doesn't allow them to do a lot of some things they might think of doing.

Outside of outreach, that whole passage there, with an open mind by the agency to perhaps look at things that weren't considered before.

MR. PEARCE: Rai?

MR. ESPINOZA: One that I think is important is NMFS building off previous successes, and we will see how those can be replicated and

adapted to other areas because the successes have been there, there has been outreach, there has been science, so something is working. Replication is needed and is possible.

I think part of the problem as well as mentioned before, lack of trust both ways. My third one is fishers take the risk in the current system, fishes aren't taking the risk.

MR. PEARCE: All right, Rai. John?

MR. CORBIN: I can't think of an aquaculture one. The regulations that prevent adaption and the problems with lack of trust and certainly the need for better outreach to fishermen would certainly make sense to me.

MR. PEARCE: Thank you. Jim? I kind of passed you on the first one, were you here?

MR. PARSONS: No, I kind of follow John's lead on that one, we probably need another bullet point that says better access to net/pen opportunities. (Laughter) We won't talk about that one right now.

It seems to me that without trust in the

community, nothing is going to happen. You can try to provide outreach to a sector, but if they don't trust what you're telling them, that seems to be first and foremost, and then adaptive management, there needs to be a way for management of these fisheries to respond somehow quicker and get the word out and for the fishermen to trust what is happening.

MR. PEARCE: All right. Michael?

MR. OKONIEWSKI: I've got four that are about a toss up. It's easier to shut down the fishery, and the second would be the regulations prevent adaptation, and I think third is lack of trust. I think maybe more importantly what are we going to do about it.

MR. PEARCE: Erika?

MS. FELLER: After taking some time to carefully view and reflection (Laughter), my three would be fishermen taking on the risk under the current system, regulations that prevent adaptation, and lack of trust.

MR. PEARCE: Okay. Thanks, everybody.

We had some pretty heavy hitters here. Management locked into certain approaches, that is one, fishermen invested in certain types, that is one of the top ones. The first one really was lack of trust. Lack of trust is the top one. Management is locked into certain approaches, number two, and then two kind of tied, and that is need better outreach to fishermen and then regulations can prevent adaptation. We have four here that are pretty close that we can say we brought out of this particular discussion.

MS. MORRIS: Question three.

MR. PEARCE: We are going to move -- I'm not going to read all of them to you in the interest of time. Question three, the question is can you identify examples or approaches that have allowed managers to respond to a change quickly. Example, framework amendments.

Who wants to go first? Bob, are you ready?

MR. RHEULT: No, this is the first time I've seen this.

MR. PEARCE: Okay, gotcha. I'll give everybody a second. I can read them, if you want. (Pause) Is anybody ready? Raise your hand. Don't be bashful. All right, that's good. What you got?

MS. MORRIS: The predictions of changes with (Inaudible), sharing the data on bycatch rate, the pollocks in Alaska examples, and the one right above that about communication pathways already established.

MR. PEARCE: Got it. Mike, that puts you up.

MR. OKONIEWSKI: In-season management, emergency actions, but they only go one way in my opinion. It is fast, relatively speaking. Real time data where we have it. It's not much of a reply because the in-season management is the only one that I see that is actually effective in certain outcomes, as far as being adaptive and responsive. Emergency actions, it is an one way street, seems like.

MS. MORRIS: Okay, Jim?

MR. PARSONS: I think probably data comes as number one, both the acquisition or real time data so that people know what's being responded to, sharing that data, and for both sides to kind of trust the transparency or the progress. These are actual data collected from your fishery and here's why we need to do this. I think the programmatic assessment, I think NEPA is going to be a stumbling block in doing things. Real time data and sharing data.

MR. PEARCE: Okay. Rai?

MR. ESPINOZA: In-season management, real time data. I'll stay with two.

MR. PEARCE: Two, okay. Dick?

MR. BRAME: Come back to me.

MR. PEARCE: Terri?

MS. BEIDEMAN: I read this as what has worked, you know, so I'm not looking at anything I don't really think has worked. Shutting fisheries down or respond quickly. I think in-season management in certain fisheries has worked very well.

Certain framework amendments, they are usually the same actually as the framework. I would agree with Mike, emergency actions work really, really fast, but they are usually really long-lasting. They are not my first choice but if they can do it, great.

I don't want to be managed that way, but if we are talking about what has worked, those are the ones that have that I know of.

MR. PEARCE: Peter?

MR. SHELLEY: I believe the things that have worked are the bycatch reduction, the sharing of data and programs where people have moved on and off. That seems to have worked. Maybe that is a way of saying where the managers have been really clear about a particular outcome and then allowed a lot of flexibility in the industry to achieve that outcome. Those seem to work best.

I think in that cluster of framework amendments and different approaches to the planning documents that would allow more efficiency in complying with both Magnuson and

ESA.

MR. PEARCE: Bob, are you ready?

MR. RHEAULT: Yes. I guess I reject the premise, I have really never seen management respond quickly. (Laughter) In an ideal world, I guess if we did share data, it could speed the process, get the fishermen to share data.

MR. PEARCE: That's it? Okay. Peter? (Laughter)

MR. MOORE: I like oysters, but I don't think all fisherman (Inaudible).

SPEAKER: Most fishermen don't want you to know where they are fishing.

MR. MOORE: Well, that's fair. (Laughter) That data, yes.

SPEAKER: Well, but that's sort of a critical part of what the data might be.

SPEAKER: Can you identify examples or approaches that have allowed managers --

MR. MOORE: Are you looking for specific examples that I'm familiar with or are you looking for I know emergency actions work to close

fisheries? I can tell you there are some of these things that I have seen work. Do you want specific --

MR. PEARCE: No, no.

MR. MOORE: Okay, I'm sorry. I would like to see an emergency action/exempted fishing permit work in both directions. If we see a bloom of something, there is an opportunity to create it as opposed to a scarcity or something, and it's an opportunity to fix. It's one way right now. I think if it could go both ways, that would be fantastic.

There was another one, what Peter was talking about, about bycatch avoidance. In some cases, I have seen it work. That really depends on what Bob was just saying about okay, what is the data for that. That gets to whether it is observers or port samplers, you have to have that.

Those are the three things that I would say work.

MR. PEARCE: Pam?

MS. YOCHEM: What I have seen work is

communications pathways established prior to an emergency, but I would also say in addition to the communications pathways, some sort of protocol or planning, so it is not just communicating but having some contingency plans in place.

MR. PEARCE: Julie?

MS. BONNEY: One other thing is we organize as a fleet and then we communicate, we have access to data and communicate with in-season managers so we can react, if we can get all the participants in the fishery to react to a situation, then we can avoid a problem, whether it be bycatch or small fish.

The problem is our structure is based on voluntary, so really you want an actual regulatory cooperative structure, that is what most of the Alaska templates are made of, you are authorized to become a cooperative and you are not required to -- a voluntary system. Everybody works in a regulatory framework that requires cooperation.

MR. PEARSON: Okay. Columbus?

MR. BROWN: I would say emergency

actions, framework, and then the migratory framework.

MR. PEARCE: Ted?

MR. AMES: I said collaboration with states and other Federal agencies and groups, sharing data to avoid bycatch seems to have worked pretty well. The one out of that whole list that interests me, perhaps because I know it best, is the Maine lobster fishery.

That is the only fishery I know where commercial fishermen go and ask scientists to work on problems, where the scientists actually listen to the fishermen. They are working together. It has a multi-layered structure that addresses both Federal concerns, state concerns, and the concerns of the individual fishermen.

It is almost a federalized system where local lobstermen groups elect their own representatives who participate in a super zone for the largest state that interacts with the ASMFC, and then with the Feds. The end result is fishermen have a voice, can effect the ground

rules in their immediate area without having to change the entire system. They can fine tune it for the conditions of the fishery they are in. It's a powerful tool.

If NMFS could do one thing, if it could develop multiple scales of management where they delegate authority on the condition of the responsibility of taking care of it, I think we could get over a lot of the problems that we were talking about in this last one. Not that I'm biased at all.

(Laughter)

MR. PEARCE: Mike?

MR. OKONIEWSKI: I'd like to change my vote.

(Laughter) Sharing of data instead of emergency action. I didn't consider that because I was thinking in terms of managers, and they really aren't the ones sharing the data. I guess in your case maybe the data that has come back,

but as far as putting together a plan of avoidance, it is more up to the individual.

Where they have rules of conduct in coop's, they actually do have to comport to those rules of conduct, whatever it is. If they don't, there are penalties. It can happen. Does it happen all the time? Probably not.

MR. PEARCE: Bob, Dick will be glad to tell you where he catches all those fish.

(Laughter)

MR. BRAME: If you stand in Kansas and face north, it's off my right shoulder.

(Laughter)

MR. PEARCE: Well said.

MR. BRAME: Yes, with migratory birds -- it's a process that contemplated a priori what's going to happen. They determine the population size, if it reaches a certain level, you put in framework A or framework B or framework C, depending on the population size.

MR. PEARCE: All right. Any other

comments before the election is over?

(No response)

MR. PEARCE: Real time data was on the top. Sharing of data, bycatch rates. We had three or four more other than that, one was emergency actions, one was migratory birds, one was in-season management, and sharing data. You had one/two solid ones, and the other three or four fell right behind it.

Moving to question number four, I'll read you the question. Are there management approaches that have allowed fishermen to adapt quickly? Example, Alaska fishing cooperatives. Who wants to start? You want to wait a second and read it? (Pause) My three, while you are thinking about it, was catch year program, collaborative management, and real time data to open and close areas.

MR. OKONIEWSKI: I'll take a crack at it.

MR. PEARCE: Go ahead, Mike.

MR. OKONIEWSKI: I'd like to say

collaborative management, but I don't know if I can point out examples. There must be some somewhere. I don't mean to be cynical. Risk pools and coop's, I think that has absolutely worked. This is all stuff that's already been done, it's not looking at things that might be done, right? Some of those are in the category of might be done.

MR. PEARCE: These are what we came up with on the two conference calls.

MR. OKONIEWSKI: Okay. Need to allow flexibility on how to hit management targets, less prescriptive. I think that includes OY, very definitely. Catch year programs that are constructed the right way.

MR. PEARCE: That's four, but that's okay.

MR. OKONIEWSKI: That's four? I'm done.

MR. PEARCE: Jim?

MR. PARSONS: In our business, certainly we like the approach where the regulatory agency tells us what the targets are and then let's us

determine how we are going to meet those targets. To me, that doesn't happen often but that is a nice approach. Data. Some of the others I don't know enough about the different types of fisheries to choose another one. I'll stick with those two.

MR. PEARCE: John?

MR. CORBIN: Again, I don't know much about most of these either, but I would say smaller management units, good communication, and the last one, prediction of changes with appropriate communication.

MR. PEARCE: Rai?

MR. ESPINOZA: I only have two as well, and I'm going to go with our recent experience in the Caribbean to move to island based, smaller units. That seems to be an improvement. Also, real time data.

MR. PEARCE: Okay.

SPEAKER: Raimundo took mine. Smaller units, real time data.

MR. PEARCE: All right, got it. Teri?

MS. BEIDEMAN: Need to allow flexibility

--

MR. OKONIEWSKI: I am going, but can I just make one announcement first?

MR. PEARCE: Yes, sure.

MR. OKONIEWSKI: For people coming over to the plant, I suggest if you have tennis shoes or jeans or whatever is comfortable, that might be more appropriate. That is it. You should probably dress warm, too.

MR. PEARCE: All right, see you tonight. Thank you, thanks for the invite, too.

MR. OKONIEWSKI: You bet.

MS. BEIDEMAN: The need to allow flexibility on how to hit management targets. I think that's more of a collaborative measure. I also think good communications with the industry about upcoming changes, give people time to prepare and don't get blind-sided. I think most fishermen don't feel like they have the opportunity to really do any of the big adaptions, most of it is thrust upon them, and they just try to react. Hopefully, we can get some of these

other things.

MR. PEARCE: Pete?

MR. SHELLEY: I'll start off with flexibility, less prescriptive. I would just use a well designed catch share or cooperative program as a mechanism of that or an example of that. Again, theoretically the catch share/cooperative programs are hardly intended to give that kind of quick flexibility. Another one, and maybe Peter Moore knows more about this, the study fleet, having a study fleet that the fishermen trust or gives them confidence in the results. I know in Norway, or at least I believe in Norway, it's very successful in terms of closing a fishery really quickly.

MR. PEARCE: Okay, got it. Bob?

MR. RHEAULT: I would go with the flexibility, the change I've seen in a fleet, I don't know if that counts. I'll pass on the rest.

MR. PEARCE: Okay, Pete?

MR. MOORE: I would say the need to allow on flexibility on how management hits

targets and also the mechanism to allow new species as opportunities.

MR. PEARCE: That's it?

MS. BONNEY: I have two, the communications about upcoming changes and the need to allow flexibility in hitting targets.

MR. AMES: Real time data, open and closed. Sorry.

MR. PEARCE: Julie?

MS. MORRIS: I'm going to go with flexibility, catch share program, and collaborative management with industry and councils.

MR. PEARCE: Okay. Columbus?

MR. BROWN: Catch share, real time data, open and close.

SPEAKER: I'd go with real time data, collaborative management, flexibility, and I'd also say smaller management units, but I'm qualifying it for saying for critical habitat areas, not smaller management units in general because it is totally -- it would create an

impossible situation.

MR. PEARCE: Erika? Last but not least.

MS. FELLER: Real time data, risk pools. I'm going to stick with those two.

MR. PEARCE: All right. Got it. Need to allow flexibility came in first. Real time data was second. You had catch share and collaborative management basically the other two, with a smaller management units coming in a close fourth.

MS. MORRIS: Thank you. Thank you, everybody.

MR. PEARCE: We cut a lot of stuff that we just didn't want to do. As we go through the process, we can come back and add or do whatever we want to down the road. At least now, we have something for you guys to concentrate on and to get our job done.

Any other comments before I close this taskforce meeting?

(No response)

MR. PEARCE: Good, almost tea time.

Columbus?

MR. BROWN: There was one thing that came to my mind that I just wanted to share. I think one of the problems is we know we need to be somewhere else, but one of the big questions is how do we get from here to there and keep businesses open. I think that is where a lot of the trust questions come from, and a whole bunch of other problems. As there is change, people are really concerned about what that is going to look like and how that is going to affect my operations.

MR. SHELLEY: That's a good point. There used to be effective coordination's, and I'm now seeing sort of an atrophy of that, and whether it is real or whether the people are just not engaging, and I am also seeing a couple of scientists actually moving to fishing communities, getting that trust, and working directly with fleets on some of this habitat modeling and a study fleet approach.

I think in some cases it has been a

tremendous turn around. It takes a special person, but I think when you see those kinds of examples working, that goes to what Columbus was just talking about, where you see that happening, you can think about doing that more and more. That is not Sea Grant people. It's more John's people, that kind of level people.

MR. PEARCE: Did we give you enough to think about?

MS. MORRIS: Absolutely.

MR. PEARCE: Hearing a loud message across all of these about real time data, seemed to be a little bit of a theme. (Laughter) Thanks, guys.

MS. MORRIS: Thank you, Harlon. Thank you, everybody. Erika?

MS. FELLER: I'm going to be really quick. We had our first call of our group just last week or the week before, so what I wanted to do this afternoon is share with you what we talked about and how we are tackling our task.

There is one thing I'm going to ask for

your help with, so I wanted to give you a head's up that is coming in your direction. For the communications group, we are charged with finding ways to increase kind of access, delivery, and use of information about climate and fisheries. We have two subtasks, and we are kind of focusing on the first one right now.

The first one is to assess the climate related information needs of stakeholders, how better to communicate with stakeholders, and which methods are the most useful, which kind of indicates we need to learn something about what kind of communications are currently happening and develop some type of criteria or some type of metric to evaluate what works and what doesn't, so trying to come up with ways to do that.

The second part of our charge, which we haven't figured out how to do yet, is to identify the best communications tools to provide information to your local communities, tribes, NGOs, businesses.

Focusing on the first part, which we see

as kind of a research exercise, on our call, we had a lot of conversation about who are the audiences that we are trying to reach, and kind of like during the presentations, who are the audiences, what are their values, what do you want these people to do, kind of a really key part of it. We are working on that.

The second thing we are doing, one of the ways you typically do this type of audience assessment is with research tools, focus groups and outreach, how you kind of get to know what people are interested in. We are just the tiniest little bit limited in terms of what we can do, and Heidi is trying really, really hard to help us with the issues.

I think we have an opportunity to at least collect some basic information about what kind of tools are useful to people, what do you want to use it for, what formats work for you, who are the leaders. This is really key.

I think with fisheries, it is as much about written communications that go out as it is

with influential people in each of the regions where they are thinking about these problems and bringing people together. They are a critical communication outlet.

That is the resource we have access to -- all of you. Sam and I have put together a short survey. It's really just kind of three overarching questions to ask you about your communications preferences, what kind of information, what Web sites do you use, what mailing lists are you on, what meetings do you go to, who in your region would you identify as being kind of one of those people that people really listen to in that part of the world. What type of attributes of communications do you look for and you find particularly useful.

This is something we are planning to send out in the next week or so, and hopefully you all can fill this out and provide feedback to us. We will not share the data that we collect outside of the very small working group that we have. We'd like to share it with all the members of that

working group, but anything else will probably be summarized responses to that survey. There is that.

That is reaching out to you guys and finding out what you know. There is kind of a fourth question, which is what is NOAA currently providing. We are working with NOAA to understand better what types of climate related information is out there, what types of forecasts and other information are they providing, and also get an idea of what kind of stuff is in the pipeline, kind of coming down the pike. We just want to sort of get everything out on the table of what is going on.

Then we want to bring all of this information together, and we are going to break up our little work group into about four different sections, and get them to kind of look at this information. Who are the influential leaders, what kinds of resources are you guys using, all that kind of stuff, and cull through it and start to generate what appear to be the attributes or

criteria that characterize the type of information that people are looking for. Hopefully, we can do this research and begin to have those kinds of more synthetic conversations.

By the end of this, we will at least be able to do that kind of assessment of what kind of information is out there, and we feel like that is going to give us a pretty good idea of how to tackle our next task, which is making those kind of proactive recommendations to NOAA of this is what we think you ought to do.

We are also tracking tasks four and six, which are very closely related to what we are doing, because that was the other piece, what are you selling, what is the product, and I think what we do is going to be directly related to what they come up with, and it is probably going to comprise the meat of the recommendations we give out.

Any questions about any of that or any concerns?

SPEAKER: I'm not a typical shellfish runner, so asking me how I get my information

isn't going to tell you about my constituents at all. Should we be sending this out to fishermen groups and asking them to fill out a Survey Monkey? It's pretty easy to do. I've got an account. We could get a broader picture.

MS. FELLER: Well, it's already on a Survey Monkey. I did that because I got an account, too. I love Survey Monkey. I just want to make sure we don't get cross- wise with the (Inaudible). I think that would be helpful, and even if there are those people and you want to like list people we should reach out to, give me their names, we will call them up and talk to them. In fact, I think there are maybe other ways to do that. I am kind of hoping we will be able to do a broader survey.

Just so you know, like what I send you is going to be my best attempt at a survey. Part of what we want to use you for is your answers and get your feedback on how the survey is constructed, so that if we are able to go out more broadly, you know, the survey is pretty tight.

SPEAKER: Have we developed a target audience yet? Are we looking for fishermen? Are we looking for policy makers?

MS. FELLER: It is kind of everybody. We have a short list that includes fishermen and fishery dependent communities, aquaculture industry, sport fishermen, sort of an investor, maybe financial community, people who make those types of investment decisions, coastal communities and local governance, climate outreach organizations, and leaders in those types of organizations.

We sort of have to figure out who all these people are and what they need, and I think all of this we are also going to unpack a little bit by region.

MS. MORRIS: Thank you, Erika. Any other questions or comments?

(No response)

MS. MORRIS: We can either recess now -- Columbus has a question.

MR. BROWN: I think at some point you

are going to have to think about making sure we are getting the kind of outcomes that are worthwhile for the information that is being invested in. If you can't measure somebody is getting this information and doing something with it worthwhile, it is just more stuff out there on top of other stuff.

MS. MORRIS: Anything else? (No response) Ready to adjourn for the day? Yes? Okay. 4:00 at the curb. 9:00 tomorrow, we reconvene. Thanks, everybody.

(Whereupon, at 3:30 p.m., the PROCEEDINGS were adjourned.)

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CERTIFICATE OF NOTARY PUBLIC

COMMONWEALTH OF VIRGINIA

I, Carleton J. Anderson, III, notary public in and for the Commonwealth of Virginia, do hereby certify that the forgoing PROCEEDING was duly recorded and thereafter reduced to print under my direction; that the witnesses were sworn to tell the truth under penalty of perjury; that said transcript is a true record of the testimony given by witnesses; that I am neither counsel for, related to, nor employed by any of the parties to the action in which this proceeding was called; and, furthermore, that I am not a relative or employee of any attorney or counsel employed by the parties hereto, nor financially or otherwise interested in the outcome of this action.

(Signature and Seal on File)

Notary Public, in and for the Commonwealth of Virginia

My Commission Expires: November 30, 2016

Notary Public Number 351998