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Noji, Thomas ~ Oral History Interview

Bonnie McCay

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Voices from the Fisheries
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Interview with Thomas Noji by Bonnie McCay
Summary Sheet and Transcript

Interviewee
Noji, Thomas

Interviewer
McCay, Bonnie

Date
June 14, 2016

Place
Sandy Hook Lab
Northeast Fisheries Science Center
Sandy Hook, New Jersey

ID Number
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Use Restrictions

Biographical Note
Dr. Thomas Noji grew up on Long Island. He earned his Bachelor's degree from Earlham College, and completed his Master's degree and Ph.D. at the University of Keele in Germany. Dr. Noji worked in Germany and Norway for 21 years, returning to the United States in 2001 to work at the Sandy Hook Lab of the Northeast Fisheries Science Center. As of this recording in 2016, he is the Ecosystems Processes Division Chief.

Scope and Content Note
Interview contains discussion of: outside funding for projects, future of the Ecosystems Processes Division, ecosystem-based fisheries management, effect of climate change on fisheries, eDNA, using ecosystem information in stock assessments, agreements between Sandy Hook and local universities, labor shortage at the Sandy Hook lab, reopening restricted fishing areas, community outreach and education in fisheries and aquaculture, budget challenges in fisheries science, diversity in the Science Centers, 2017 ICES science conference.

In this interview, Dr. Thomas Noji gives a detailed description of his background and his experiences working at the Sandy Hook Lab of the Northeast Fisheries Science Center. He goes into particular detail about the effects of labor shortages at the Sandy Hook Lab, as well as the future plans to focus on aquaculture.

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Bonnie McCay (BM): All right, this is Bonnie McCay on, and I'm here at the Sandy Hook Lab of the James J. Howard Lab of the Northeast Fisheries Science Center--

Thomas Noji (TN): That's right.

BM: --on the 14th of June 2016, with Tom Noji. So Tom, um, would you like to start by first of all giving me a little bit of your, first, before we talk about your experience here, where did you come from? In other words, what kind of training did you get, how did you get involved in this, the kind of work you do?

TN: So, you know, my career path was very different, probably, than most persons in the agency. I went to a, an undergraduate college, a small one in the middle of Indiana in the Midwest, at Earlham College. I don't know if you've heard of Earlham.

BM: I went to Valparaiso.

TN: And got my degree there, and then after a few off years, continued education at the University of Keele in Germany, where I got the equivalent of a Masters and a Ph.D. in the early '80s. Worked there for several years, so I was there for at least ten years, and it was all interdisciplinary, ecological work, so I worked a lot with, with geologists and hydrographers. And then got married there and moved to Norway where we lived for eleven years and raised a family, and eventually came back to the agency here.

BM: And where were you in Norway?

TN: In Bergen.

BM: And where...

TN: At the Institute of Marine Research.

BM: Okay.

TN: So there the work was also very interdisciplinary. I guess the whole time my focus has been really the role of plankton in recycling and cycling of, of elements in the open ocean. It became increasingly more coastal and more fishy later, but, uh.

BM: So your undergraduate training, was that in marine biology, or was it in zoology?

TN: No, that was in biology. There was one course at the University of South Florida, no, I guess the University of Florida, in St. Petersburg, that, that I took, which maybe was, was instrumental in deciding to go on into marine biology, because I was working with a really good, very well-known planktologist who's name was Karen Steidinger. And she was...

BM: Karen Sidinger?

TN: Steidinger. She was kind of a guru of harmful algae blooms and stuff. So that kind of shaped, that kind of paved the way, I think.

BM: And in, Keele, I imagine Keele has been a center for systems and approaches and ecological, and ecology, am I correct on that?

TN: They are very, very, very progressive, you know, the Germans have these things called Special Research Projects, which is kind of similar in some ways to large multidisciplinary NSF [National Science Foundation] programs, but, you know, this was really before the days of the European Union, and these Special Research Projects really were designed to bring as many different disciplines together to address larger, you know, larger, more complex topics in a more holistic fashion. So, yeah, they were great, you know. And so we had some very, very good, young leaders at the time. Some of the names, I don't know if you'd recognize them because they're very European, you know, very big names in Europe, but G. Hemple was one of the, the big leaders of that, and Victor Smetacek, a very, very well known planktologist now. Many others, and so it was a great experience because it was mostly interdisciplinary, you know. I've never, I've very rarely, in my career, really worked alone on a project. There were almost always multiple collaborators. I think that also kind of changed the way I, changes the way I'm thinking in terms of science in general.

BM: So, um, could you give me some, give me some dates now about like when did you finish your undergraduate degree, or?

TN: '76.

BM: Yeah. And you Mas-, your Ph.D./Master's combination, your degree at Keele?

TN: That didn't come until '87, I think.

BM: Yeah.

TN: And so from 1970, well from, let's see, from '77 until about 1980, I guess from '76 to 1980 I really was just traveling through Europe--

BM: Very good.

TN: --with my backpack, and the whole thing. Did a lot of different jobs, spent a lot of time in Greece, a very long time in Greece.

BM: Did you?

TN: Yeah. And eventually applied for, for a graduate school at the University of Keele. And surprisingly got in, so, then I came back to New York to make money and then after about another year I did go over because I got enough money to actually travel back.

BM: Yeah, that's great. And then, so then you went on to Norway in Bergen where you were at the Institute about what time, what period of time?

TN: We moved in, I think in 1989, so it was really right around the time of the Berlin Wall--

BM: Yeah.

TN: --come crashing down, so that was big. You know, I was married to Carola by that time, and I guess I was doing sort of a late post-doc, with Chris Hopkins in Tromso for a while.

BM: Oh.

TN: And then we moved to Bergen. It was, it was supposed to be sort of a joint project between Chris and, and, Hein Rune Skjoldal is his name, in Bergen, a very good ecologist. But we did end up moving down to Bergen a little bit earlier than we had planned because I really didn't, I didn't handle the winters there in Tromso very well. I had been there...

BM: You wanted some light.

TN: Well, the summers are great, because I had worked there for a half year once with, with an English scientist, and I kept assuring Carola, you know, don't worry about this, it's going to be great. She was fine in the winter; I was not. So.

BM: Yeah, I spent several weeks there in January once.

TN: It's pretty, well you know, it's great weather, honestly, you know.

BM: Yeah, yeah.
TN: But it was the light deprivation and I didn't really even think about sort of a light treatment at the time. If I had, if we had talked more about it at the time, or if there had been more, you know, focus on light treatments I probably would have done it, but, it is what it is. It worked out.

BM: Yeah, yeah. So you went to Bergen, you were at Bergen and then when did you leave Bergen?

TN: We left in, let's see, in 2001. So it was a good eleven years.

BM: Yeah, yeah.

TN: And it was a good eleven years, you know. We could've lived there for the rest of our lives. But for the fact that, you know, you, it's not just that you, that as a foreigner it's difficult to really get integrated into society, but if you're not like a fifth generation person from the town, you can't get integrated in. So the kids were, you know, about five or six years old when we decided, if we're going to really settle down somewhere, do we want to stay here where we probably always will be a little bit different. And it was just purely coincidence that this job opened up here.

BM: Oh, is that right?

TN: It's not, it was just, it was, it was just simply a search online, that's all it was.

BM: Is that right?

TN: Yeah.

BM: And it was perfect for your background, right?

TN: It worked out really well because my background fit, sort of the ecosystems, it was the, there was always a strong ecosystem background, it was always multidisciplinary. I came, originally, from the area. I'm from Long Island, so I wanted to come back to family on the East Coast. And I think, kind of importantly, I didn't really know the folks here.

BM: Is that right?

TN: And there was a lot of contention going on at the time. There was a lot of, uh, let's say, disgruntlement between employees and management, and so I think that...

BM: Best you didn't know.

TN: Our leadership thought it would be best to bring in someone with no baggage. So it just kind of worked out.

BM: So you've been here since 2001? 2002?

TN: 2001. I know, the time has actually flown by. I keep thinking that I've, you know, the new guy on the block, but then I, I'm looking back at our, our, uh, executive staff and like, wow, I'm now, you know, the only other Division Chief that's been here longer is, is Wendy Gabriel. Everyone else is newer or something like that.

BM: Wow.

TN: Yeah, and, and, it is quite amazing.

BM: Yeah.

TN: But despite the fact, the other persons whom you've interviewed have been here much longer.

BM: Yeah.

TN: In some cases three times as long--

BM: Right.

TN: --over three times as long.

BM; Right, right. Yeah. So let's, um, let's, I think we've covered several different things. The research focus of this unit when you got here then, in 2001, was, as you said, was ecological, in a way, and can you talk a little bit more about that, and, and then where it's going. Really, what we'd really like to talk about is how it's developed since then.

TN: Well, it was interesting because, you know, you, one preps for like the seminar and all, and you know, everything was telling me that this group was all about essential fish habitat. And that there was a neat, you know, field study or two, like the dumpsite study, which had been conducted.

BM: Right.

TN: And so the focus was, was very much on habitat, um, habitat condition, and it was very, sort of, academic almost. How are you doing?

??: Good, how are you?

TN: Okay. In other words, it was good science and it was being conducted because it was good science. And there was not as much pressure then, despite the fact that there was EFH [essential fish habitat]. There really wasn't as much pressure to deliver the products which were going to feed directly and quickly into management. Not as much then, from the fisheries perspective. And I guess that's sort of code for, there wasn't nearly as much pressure then to deliver data and findings which would improve, or support, traditional stock assessments. I mean, that's really, so there was a transition. There was, and the reason there was a transition is because the funding got, every year it got worse, which I'm sure you've heard. [laughs]

BM: Yeah, yeah, right.

TN: Um, so in the beginning, I think there was, there was not a happy-go-lucky atmosphere, because the only reason I was being brought in was because they were so unhappy with the previous Director, I mean, the previous Division Chief, whom I never met. So after he got basically, uh, forced out, and after the union was formed because of that whole situation...

BM: I didn't realize the union was formed here.

TN: Yeah. They brought me in. There was, you know, it was kind of funny to do the interviews, because I kept getting questions like, so how do you deal with employees who, who are, who are, uh, um, difficult to manage, or, you know, what, what do, you know, how would you approach a disciplinary, you know, and, a situation requiring some sort of disciplinary action? They kept asking me things in the interview, like, why are you asking all this? But, uh, so then initially, I mean, most of the, most of the time was spent just trying to get people to, to gain their trust, honestly, for the first couple of years.

BM: Yeah.

TN: But also it was trying to deal with every year, diminishing funds, so there was a, definitely sort of a transition from, um, being able to conduct the good research that one wanted based on its' scientific merit, to having to do progressively more things which the agency felt would support its' top priorities. And EFH sounds good, but there's very little funding that goes to EFH. It's much more about, um, stock assessments. And so we had a situation where the staff had to be willing to trust management a little bit more. We had fewer funds, which was forcing us to change the kind of work that we were doing, so it was very interesting in that, honestly, that hasn't changed that much. So I'd say, since I've, from when I started to now we've probably lost almost 50% of our staff.

BM: Is that right?

TN: Almost. Almost. The, and we also are much, much, much more dependent upon reimbursable funds, so, you know, Vince [Guida] is a great example, I mean, five or six or seven years ago he and, well, it was actually before he became the Branch Chief, so his predecessor, Rich Langton, who you might know, do you know Rich Langton?

BM: I don't know him, but I know of him and I've--

TN: He's a...

BM: --talked with him a little bit.

TN: He's a nice guy.

BM: Yeah, yeah.

TN: And a good ecologist. And then we had a young, oh, you might know Jennifer Samson was a--

BM: Yeah, sure...

TN: --when she graduated, Judy Weis's student--

BM: Yeah.

TN: --she was one of the best, I thought; I bent over backwards to get her hired. I shouldn't talk about that, but we made that happen. And, and then she was really right there, and after three years she decided, she has this wonderful opportunity in the Pacific Islands, so she took it. And plus there was, it was still difficult here, I mean, it's even more difficult now. She was one of our best recruits, but, you know, at that point, just a quick anecdote was, you know, there's this thing called BOEM [Bureau of Ocean Energy Management] all of a sudden, does anybody know about it? Not really but they seem to have a lot of money, Tom said, "okay, let's get in the car", and literally a couple days later we just drove down to Herndon, and spoke with them and said, "you know, we can do all this stuff." And that's how Vince got his, you know, one and a half million dollars, and he inherited that from, from Rich, and from Jenny who were leaving at the time. So that was, that suddenly became the mode of operation, if you know what I mean.

BM: Yeah.

TN: Having to really go for outside funding and--

BM: Yeah, yeah.

TN: --we were successful and I think we're still fairly successful at getting, you know, funding from other agencies, but at this point what we really need to do also is get more collaborations from industries that can actually afford to support us directly, and there aren't too many--

BM: Yeah, right.

TN: --but there are some. Um, so we're, I think, let's see. I mean, we've gone through different phases, but I think, in general, we kind of went from that situation where we were sitting kind of fat, um, doing the good science, um, to a certain extent there were one or two big projects but there were also several smaller projects and then kind of went through a phase where I was really saying, you know, we've got to, we're losing staff and we're going to have to, you know, bring the remaining staff that we have to focus on fewer projects which were more supportive of management. So for, you know, so there was the BOEM project and before that there was a large, pretty large project focused on that harbor site, the remediation site, the dumpsite--

BM: Oh yes, right.

TN: --of New Jersey. And, you know, that was getting funding from USGS [United States Geological Survey], and, but I think at this point, I think we, yes we will continue to work within the agency and with other agencies to support our staff, but I think we're going to have to work more directly with the industries, too. So that's kind of the--

BM: What kind of--

TN: --the new...What?

BM: Have you been able to work with industries yet? If so, which ones?

TN: Here? We're not, we have not, not the way I'd, we'd like to. Um, you know that one of the things that is, that you've probably heard although I'm not sure, I mean, this whole, I think the, the focus of the lab is going to shift. And partially it's driven by the fact that we're merging with another division.

BM: Oh that's right, you're merging with--

TN: The, the--

BM: --the aquaculture.

TN: --the Aquaculture and Enhancement Division, it's called. So, although this is, you know, this laboratory houses a lot of different, um, units, you know, the Ecosystems Processes Division is, is the bulk of the staff. We've shrunk tremendously, but we're going to merge with the Aquaculture Division, and we're going to become the Ecosystems and Aquaculture Division. And that, actually, I think, is a very good thing. Even though most, a lot of staff are skeptical. But what I've learned from the Aquaculture Division, is that it really is possible to work with the industry, and it's easier for them. You know, it's, you, we've got the industry very, very, very supportive of the staff there. The community, less, because they're not, they're not in the, you know, the community is not as aware of the staff in Milford, like they are here. But the industry really is, and so, you know, they're on Capitol Hill all the time.

BM: Yeah, yeah.

TN: And because of the industry, we've gotten, I've gotten a lot of requests from, from the, from Congress to, to, uh, provide some feedback in terms of long-term staffing plans. So that's what I need here. And I think that, that's why I think the science that we're going to do is going to continue, you know, we have to shift a little bit and take better advantage of what we can do. And it's, but it's still going to be along the lines of broad, how does broad scale environmental change affect, um, --

BM: Right. Well, you have now, you have the--

TN: --the impacts at a more local level.

BM: --Ocean Acidification Project.

TN: Ocean acidification is there, I don't think that's going to go away. But I do think that there's going to be less, I think there will, there will be slowly less, um, focus on ocean acidification, you know, there have been more and more reports coming out and not all of them are pointing to big effects.

BM: Right, right.

TN: But I think everything that we're doing is pointing to the, or all of the, all of the knowledge which is slowly accumulating, is still underscoring the importance of climate

change. And, so I think we have to hang our hat on that, so to speak. And it's partially going to be climate change with respect to fish and, you know, fish migrations and all that stuff which adds up to fishery sustainability. But I also think, and this is where it becomes new, we, we will begin to work more with other industries that will be affected by some of the climate effects that, that we're anticipating, which we traditionally haven't done. So, you know, we've got, not sea level rise, but you know, some of the infrastructure needs--

BM: Right, right.

TN: --that are going to happen. There's a huge project in New England right now looking pretty much only at effects of, of climate change on aquaculture infrastructure. It's like, it's almost a $20,000,000 project.

BM: Is that right?

TN: Yup, yup. So I've been talking with them, I think we'll have other sorts of infrastructure, you know,--

BM: This whole--

TN: --issues.

BM: --coastal resiliency type.

TN: Well, it, it is very much more part of the coastal resiliency, but I, I'm trying to be a pragmatist, frankly, so I think it's going to be more than just communal planning. I think it really has to be--

BM: Technology.

TN: --getting that industry to knock on the doors of, of Congress to say we really need, we need more staff here at Sandy Hook. So we're kind of at that point where, where we need to do that. One of the good things, I, either you're very good at writing or, do you, you can do shorthand, is that right? [laughs]

BM: No, I'm just…

TN: If you want me to slow down I can. But, you know, we just had an ecosystem program review last week in Sandy Hook--

BM: Oh, that's right.

TN: --oh, excuse me, in Woods Hole.

BM: Woods Hole, yeah.

TN: And, you know, there are different types of reviews, and each one, each review, I think, focused on, the reviewers for each review are specialists in that field, so they're focusing on what they know, and, of course, for most of them that means this is the most important thing that we can be doing. But in the Ecosystem Program review, you know, the messages, which

were coming out, and I can only paraphrase, um, hmm, is it confidential? You know, just in general, we will be, let's put it this way, we will be taking those, that advice into consideration for planning and what I can see happening is that there's going to be more of a focus on developing more ecosystem-based fisheries management. And not just trying to improve the single-species stock assessments with, with environmental information which can be fed into the models, but actually also more, sort of, multi-species approaches, guild approaches, um, that sort of thing. But not just through modeling, and I thought that was very important. You know, we don't want to see more models. What we'd like, what they'd like, what the reviewers want to see is, uh, that the data streams, which are really important for understanding the ecosystem, are streamlined. And, um, and are there, you know, and to me that means that the work at this laboratory needs to fit into that whole approach. And so we'll have to see how that works out. It always comes at a cost of something, but what I'm hoping is, is that some of the focus and the, uh, emphasis on single-species stock assessments, will shift a little bit to do sort of multi-species and more environmental approaches.

BM: This has been talked about for a long, long, long time. But it looks like it's actually, is, has there been a technological or scientific change that has made this even more feasible than to think about than it was before?

TN: I think there always, there are continually some advances, you know, and I, I guess, when you look at it cumulatively, that yeah, you know, there are approaches which make it slightly, which might make it more possible. I mean, for example, just because we've been talking about it, we have a project in place right now using eDNA, environmental DNA.

BM: Yeah, yeah.

TN: And, uh, I don't know if anybody at Rutgers is doing it, I know that Olaf was interested, but, but we've been working with some of the Census and Marine Life folks. You might know, like, you know Jesse Ausubel...

BM: Sure, yeah.

TN: Yeah, so Jesse, right, so Jesse, you know, contacted me and said, "you know, we've got this thing here, and we're able, we've got the capability to measure eDNA" and, and uh, he actually came out with, with, uh, Mark Stoeckle, who's running, who's doing the work there at Rockefeller University, and, um, so we chatted first, "oh, remember when we met at, you know, Boston Aquarium for the Census Marine Life thing", I said, oh, you know, so we, so it really went back to just interactions through Census, and, um, he came out here and we talked, and then I was, you know, ready to jump at it, and so in fact we have now one project, joint project, we've hired someone to, a contractor to work on that project. We went to visit him at the laboratory the week before last. And so, you know, we're going to do it, and, you know, at this point it's all about the provision of ecosystem services. And but that technique, and our focus, well, our focus is on aquaculture, and you know, the impacts of different sorts of aquaculture infrastructure. But in theory, um, if we can build up the library, and depending upon, you know, how durable these little fragments of DNA are in the real world, you know, one could use this for surveying.

BM: Yeah, yeah.

TN: One could use it, you know, for plankton surveys, for, you know, the, the, you know, could almost replace, you know, ideally it could replace the trawl survey work, um, it is a great indicator for biodiversity and also abundance and biomass. I think for biomass, we'll see. So anyway, that's, you know, one example of, of that sort of--

BM: Something you couldn't have done before--

TN: --technological advancement--

BM: --until you had the eDNA.

TN: I'm very excited about this, it's cool because this could, we can, if this works out, it could be something, which we can apply nationally. And, uh, it could make a huge difference in terms of understanding what a lot of the human activities are doing in either a positive or a negative way--

BM: Right, right.

TN: --to the marine environment, so we'll see. But yeah, so I think that it is a combination of, it's partially due to the technology, but I think it's, a large part of that is because the technology has probably made it clearer to us and to society that, you know, there's, we can't just manage these things linearly, you know, that there's, there are a lot of factors that have to be considered, and so it's, the technology has also raised the awareness. And so that, I think, is actually more important.

BM: Raise awareness of the complexities and dynamics, the unknown dynamics, and...

TN: And to a large extent unknown dynamics, you know, it's really underpinned the ecosystem approach, so you know, it's like asking would an ecosystem approach have been promoted as much as it is beginning to be promoted now without that, those technological achievements? Well, probably not, I mean, it still would be, but it's, it's, you know, we're, it's in our face now, so I think it's difficult to ignore, even for the people that think that the traditional stock assessment approach is the better way.

BM: So you're, so this lab, backing up a bit now, so this lab, the Sandy Hook group, major focus on ecological processes, um, I mean that's in the name of it and the long-term history of it, but with relatively little direct input into management, except by preparing EFH documents, um, is that the major--

TN: Well, that was traditionally--

BM: --output that you have?

TN: --yeah. And that, so probably five or six years ago, I mean, it was clear to me that, or longer, that we have to become more management relevant in, you know, management's pretty short-sighted, but--

BM: Right.

TN: --so you have to take that into consideration.

BM: Right, right.

TN: So for the, we have to be more relevant for the, the things which have to be generated on a yearly basis, which is the short-sighted stock assessment

BM: Right, right, yeah, right.

TN: And so we were, we begin, we began to do more of that, you know, so for example, you've probably heard from Beth [Phelan-Hill] that they've, you've seen across the way there, we've got all these dogfish out there.

BM: Yeah, yeah.

TN: These experiments are coming together and we began to shift the work from just, um, offshore surveys and looking at, for example, the effects of trawling on benthic habitats, to continuing to conduct seawater experiments, but, um, with a deliverable, which, which actually could be used by the stock assessment, in the stock assessment process. So metabolic rates have become more and more important, you know, so that, this dogfish work is all about gut evacuation, which goes back to consumption--

BM: Right, yup.

TN: --and it, it's actually, it's a good example of, of, so how the ecosystem is becoming more recognized as being important for stock assessment, because the reason it's so important is that in combination with some DNA work that we're doing in Milford on the stomach contents of the dogfish, we know that they're eating a lot more cod than we had presumed. And, you know, the, so a lot of the old measurements and a lot of the old metrics that were being used in the equations really were kind of, not ginned up, but you know, they weren't, they didn't come about because of really good scientific work, it was kind of presumed, well, you know, we don't really have a measurement for skate, so we better use the one from, you know, some other species, and so we're trying to, we're doing more of that. That was a lot of good work that Beth was doing, and then, you know, Chris Chambers' work, you'll hear from Chris, um, more and more of that work should feed directly into the stock assessment process. That's why, he's, he has been, you know, focusing more and more on contaminants. And we've got the ocean acidification work. But I think the real challenge at, even at this point, is not so much doing the good science as getting the data into the stock assessment process, and that's the huge challenge, I think, right now. And I think with new leadership we'll be able to do that. You know, the, are the data that Chris is generating getting into the assessment for summer flounder? Um, are the observations that Beth is making on the behavior of black sea bass, sea bass, really being considered in, in sort of the pot, in some of the surveys for black sea bass, in terms of, you know, male, well, some of those, you know, sex differential behaviors.

BM: Right, yeah.

TN: Um, will the work on skates actually get in to the stock assessment process for skates, and how is that going to affect cod? The last, the last one, has shown, that worked. But I think, you know, for every one of these experiments that we do, we need to get it in. And that was actually one of the things that, for me personally came out of that Ecosystem Program

review. We see that there are a lot of, there are a lot of good models being generated and a lot of good work being generated, and being conducted at Woods Hole, mostly. But frankly, the integration within our own organization is not as good as it should be, and that's a whole other, it's a whole other question as to why that is. You know, if you talk with our staff, many of them will, will tell you that they feel frustrated that when they've approached, that when we've approached our stock assessment folks, that they're not taken seriously. But I think there's, we have to be more persistent and we also have to, there are ways to make that happen but that is a big internal challenge, really.

BM: And I imagine, I mean, as with everything, you have, it takes some learning about what the conditions are for the stock assessment people, too, and, you know, where, where they're bound by either the, just, inertia but more likely because the nature of the models they've used and the difficulty of getting something new in the process, that kind of thing.

TN: Well, what the, yeah, and, and that's part of it. That could be a big part of it. But what most stock assessment scientists would say is that the real challenge is that they don't have enough time for anything else but to turn the crank.

BM: Yeah, yeah.

TN: So it really goes back to the Ecosystems Program reviewers' recommendation that we stop investing as much, um, stop trying to improve your single-species models, and maybe shift some of your focus and resources to more of an ecosystem approach and multi-species approaches.

BM: Yeah, yeah.

TN: And because they just don't have, I mean literally, and I believe them, you know, it's, you know, from January through the end of the year they're just, almost every second is, is, is filled with some sort of urgent action that needs to be taken either because one of the Fisheries Councils is asking for something or they've got a benchmark assessment coming up and that's a huge factor as well, a bit of an attitude change.

BM: Right. I, I could say something here but I'm not being interviewed, so I will be quiet.

TN: It would be interesting to hear it.

BM: But I...

TN: You do that because, after this coffee, I think I'm going to take a quick bathroom break.

BM: Okay. Let's, let's stop right here.

TN: I will be right back.

Break in audio

TN: Different ways to, to meet some of the staffing challenges that we have. I do think that, you know, bringing in the funding is good, and it's critical, but working with people is important. And so one of the agreements, or one of the, well, agreements, that we've been

able to put into place is with Monmouth University. So we're part of their selection panel for a new endowed professorship, um, and we've been very, I've been very engaged with them, and so we will do some space sharing with the right, with the right hire.

BM: Oh, is that right? Huh.

TN: And we have a, you know, a, what we call a, it's called a cooperative research and development agreement in place which was a, kind of takes the, replaces the MOU [memorandum of understanding], but it's a lot more easy to put into place. And right now Tony and, and you know, that group, I think they just, our top candidate just turned it down recently.

BM: Oh, dear.

TN: It was a guy from Scrips who was really pretty good. And so we, we're waiting to see, but they're, you know, they need to try to get someone in place quickly if, if that person's going to hold a class in the fall.

BM: Wow, yeah.

TN: But that person would, you know, have a, either share a space, initially share some lab space with us, and get an office, and work with us. And the whole agreement is predicated on the fact that if we, you know, we come up with mutual, with research projects of mutual interest, and we'll support that person, and that person will bring students and so that's one way to supplement some of the labor shortages, and we're doing the same thing in Milford, at the other laboratory, they're not directing at the moment, but in that case we're bringing in someone from the USDA [United States Department of Agriculture] that's going to the genomics and genetics research. So we kind of have to learn to help ourselves.

BM: Have you, have you succeeded at all in getting with Rutgers in recent times? I mean, there have been in the past--

TN: Well, yes--

BM: --some, uh...

TN: --and no. Well actually, right at the moment, yes.

BM: --blue fish or striped bass or all that in the old days.

TN: The, a lot of the discussion with Rutgers kind of got, got derailed when Rich Lutz lost his job. Although, you know, I guess even at that time, there was a lot of mutual interest, probably less real collaboration. When Cisco came in, that was, Rich came in after Cisco, right?

BM: After Cisco, yeah, yeah.

TN: So I was just talking to Cisco last week, because he was actually one of the review, the panelists.

BM: Oh, I see.
TN: But, uh, you know, but we continue to work, you know, John Manderson continues to work very closely with, with the cool room.

BM: Right.

TN: And it sounds like Oscar might be running the show there right now. But the other thing at the moment that we have in place is all that work across the street, you know, it's with Grace Saba.

BM: Yeah, right.

TN: And, uh, and with her husband at GFDL [Geophysical Fluid Dynamics Laboratory] in Princeton, Vince, Vincent Saba. And so it's a very nice little collab-, well, big collaboration actually, with, you know, between this lab, GFDL, and also Rutgers. And in fact, I know that people in, in Olaf's, in Olaf Jensen's group, are going out today to get the black sea bass that--

BM: Oh, they are?

TN: --that'll go into the respiration chambers.

BM: Yeah.

TN: So that, in fact, is working.

BM: Yeah. Yeah, Olaf has been a, a real asset, getting things going.

TN: He's like, pretty amazing. And he seems to be a very nice person to work with too, according to--

BM: Good.

TN: --Carola had two bosses and she was like, I was so happy when I could move over to Coro-, to Olaf full time. But I won't go into details.

BM: Okay.

TN: And, uh, the other thing we actually have going, since we're talking, well, the new division and not necessarily this laboratory, but the new division, we're going to shift more of a focus to aquaculture. Um, not just, well, I think there'll be a trickle-down effect here. So we'll have at least one person already in 2017 who will be officially part of the Aquaculture and Aquaculture Branch, Matt Poach, Matt has been also working with, um, who was it, at the Haskins Lab, but working with Rutgers.

BM: Dave Bousheck?

TN: Well, no, but...

BM: No

TN: Yeah, but, one of the staff, and I just, the name escapes me. But, but they've been working together to basically monitor carbon chemistry of the intake, and, and outflow water at the shellfish lab. And in that area, they're, they're going to continue that, they got funding for it. And he's going to become and aquaculture person, and I think we will...

BM: Daphne Munroe, is that?

TN: Yes, yes. And, and I want to see, slowly, a bit of a transition of at least part of this laboratory to aquaculture.

BM: Yeah, yeah.

TN: I mean, I haven't, you know, I've indicated to staff that I think this will happen inevitably, if nothing, if for no other reason because there's so much support for aquaculture. And if done the right way, the, you know, we're, we're not talking about recirculation systems, we're really talking about enhancing shellfish beds.

BM: Yeah, right.

TN: And eventually moving offshore. And...

BM: And, of course, you have the history of Clyde MacKenzie's very practical work, who is just truly amazing.

TN: We were going to move two other people into the aquaculture program too, but the only reason we didn't, to be honest, is that it made Vince's branch too small.

BM: Oh.

TN: And, and it didn't catch my attention initially, and, and then, someone said, you know, they're down to like five people down in, so you had to roll a couple things back.

BM: Yeah.

TN: But yeah, there's no reason why, they will be working together. Um, but, uh, so that is, I think that will happen. And there is a lot of work that can be done here, and so Mike DeLuca is actually coming up to, uh, to Milford, along with Lisa Calvo, on the 22nd, and we're going to talk about what should we be doing. I was, I visited them a few weeks ago. I know that a lot of what they're doing down there is actually possible because they're getting the algae from the Milford lab, but they've never actually been to the Milford lab, and so...

BM: Really? Wow.

TN: I think that, you know, they would like to do some more fundamental research, and we would actually like to continue and maybe expand the collaborations we have with the industries, so I think, and Mike is extremely politically savvy--

BM: Sure.

TN: --and I want to talk about how do we prepare for the new administration? Because aquaculture is a win-win, and, uh, um, hopefully the Democrats will, will want something good to hang their hat on. But, who knows these days.

BM: Who knows, yeah, yeah.

TN: But what you were saying, you know, your experiences on the SSC is right, and that is also something which came out of, which was also recognized and discussed a little bit at the program review last, last week, which is, the industry is horribly, and correctly, afraid of, um, in some ways, the uncertainty which is being generated by, or the new questions which is being generated by the science.

BM: Yeah.

TN: And, you know, what this division and this laboratory needs to do with respect to stock assessments, is to reduce the uncertainty.

BM: Right, right.

TN: I mean, that's kind of the, that's the other pillar. There are kind of two or three things which we need to hang our hat on, but with respect to stock assessment, that's what it is. And it's not trying to, you know, it's not per se, trying to point out that there's yet another problem related to climate change that you guys have to deal with, it's wait a second, we know that the thermal habitat is important, and, you know, what the real goal is, is to try to define that so that we can reduce that amount of uncertainty.

A really good example of that is from Norway before I came over here. It was actually one of the things that I, I would, I used probably to get the job. That is the work that we did, and the, well, it was in the '90s, on benthic habitats, and deep sea corals. And, you know, the Norwegians, the Norwegian government and the system is, you know, it's only a country with about five million people, and the way you get laws changed is that you go and knock on the door of the, of the respective, relevant ministry and say, you know what, this is really important and I just talked to [name unintelligible] about it too, and we think... and that's really how it works.

So when, when the long liners, no, excuse me, when the, when the, yeah, the long line fishermen started to notice that their catch was diminishing at the coral reefs, um, they realized it was because the trawlers were coming through and destroying the reefs. So they ratted on the trawlers. [laughs] And then that went to the government, and it came to the Institute of Marine Research, and, well, firstly the government closed off the whole area. So there were large areas, the first one was called Sula Reef and was, you know, tens of thousands of square kilometers. And our argument was that well, we've, because it's a precautionary action, you know, that the, the strength of the science would be to go in there and to get more high-resolution data so we can start to open up areas. And, and at that time, actually when I think about it, that was one of the arguments that we made to the governments to start a large mapping program. And it was myself and one other person from, a geologist , who really pushed that through. And it's still in existence now. If you go to Mareano, M-a-r-e-a-n-o, do I even have poster here maybe?

BM: M-a-r-e-a-n-o.

TN: Yeah.

BM: Mareano.

TN: Mareano, dot, probably NO for Norway. [www.mareano.no]

BM: Right.

TN: It's a, it's, this is a, you know, I don't know how much they're getting every year, it changes, but it's probably on the order of $10 million dollars a year. But that was the main argument, that, that we used to get the funders to, to start that program. That we could reduce the uncertainty with, with more science and more high-resolution science. And in fact it worked. So areas of that, which had been closed off before, were reopened and that's sort of the, the analog for what we have to do for stock assessment here, and for fisheries.

BM: Now, I mean, for example, I mean, is there anything parallel that has happened with the Hudson Canyon work that Vince's group has done? You know, the, is that an example of, of something similar?

TN: I don't know of one. Because I think we're, do you know of any?

BM: No, I...

TN: I can't think of anything.

BM: I, I'm just trying to think of what else, I mean the Hudson Canyon work was, is, is like that, but it hasn't, hasn't been carried out in...

TN: Yeah, I think we're, you know...

BM: It's preliminary.

TN: No, I can't think of anything where the habitat information was provided and the result was that a closed area was reopened. You know, I mean, that's really what...

BM: Right, right.

TN: And so, you know, what could happen in the future is... is exactly that. That if we, if we can learn more about the coral habitat areas, you know, because so many areas are, are under, you know, restricted, you know, management controls right now. That in fact we can, we can, there may be areas where there are dense populations of corals in the areas where there just aren't as many or perhaps not as many.

BM: Yeah, yeah.

TN: And that those areas could be reopened, I mean, that would be exactly what happened--

BM: That would be an example.

TN: --in the Gulf of Norway.

BM: Right, right.

TN: Um, there's no doubt that yeah, you know, the, a lot of the modeling right now is, is coming together which would slowly begin, maybe, to, to support potential changes in, like, the Magnuson Act, you know. Some of the work that John, that John Manderson is doing and some of the work that is being conducted at Woods Hole and also by a couple of women right here. It really is about specific but, specific species habitats, but dynamic and pelagic.

BM: Right, right.

TN: And slowly moving in, in perhaps in the direction where we can actually have shifting dynamic habitats as being sort of the management unit. Very difficult to do, right?

BM: Very difficult, yeah.

TN: But at least now the information is coming together to show that, well, you know what, we're not, it's not just a shot in the dark, we actually know why they're shifting now.

BM: Right, right.

TN: You know, it's because we've got this twenty degree, or let's say fifteen degree sea boundary here, or, and, you know, that in combination with important benthic habitat properties, which they're following, allows us to, to--

BM: So you said that the couple of women--

TN: --to define the unit.

BM: --a couple women here doing this too?

TN: Contractors.

BM: Oh.

TN: Working for, for Vince, and um, I don't know the, hopefully, well I don't know if they're going to go to the ship program, but through the BOEM funding--

BM: Oh, okay.

TN: --you know, we're able to hire um, several people actually, and you know.

BM: Well that's interesting.

TN: Two, two contractors, who, you know, one came from the University of Maine, who's, who's very good about the habitats and ecology...

BM: What is her name?

TN: Jennifer McHenry. She's married to...

BM: I think I've, I've met her somewhere.

TN: She's a short little blonde woman.

BM: Yeah, I've, I've met her, she, she was a student with one of my, somebody I know at the University of Maine.

TN: Oh, really?

BM: Yeah, yeah.

TN: I won't ask who, but who?

BM: Well, she was Theresa Johnson, she had known Theresa, Theresa's in the Marine Policy Program. Theresa was my student.

TN: Really?

BM: So she does interdisciplinary work.

TN: Yeah. You'd never taught at the University of Maine, did you?

BM: No, no.

TN: Okay.

BM: No.

TN: I did, I spent some time up there talking to Paul Anderson, his whole group up there, and it's just, they've got, it's amazing, you know, the work that they're doing. And it's all up, well, I guess they've got the whole state to focus on, it's all focused just on one spot.

BM: That's right.

TN: But, um, and the other person is, is her name is Heather Welch, and she's more of a programmer who does the, you know, the GIS side of things. But is also very knowledgeable about benthic ecology, and her background is more, she, I don't know where she got her undergraduate, although she might actually, I think she has a Masters but I'm not even sure. But she spent some time in Australia, working in other places.

BM: Yeah, yeah. Um, one thing that comes to mind here, is that this, this project, these projects, this effort to identify and make sense of shifting habitats, dynamic habitats formed by fish and whatever, that, that, that there's a link there to technology in that to make it actionable, you need to have real time data.

TN: That's true.

BM: And we're getting closer to that.

TN: Yeah. It's almost, it's very near, it's near real-time.

BM: Yeah, yeah.

TN: You know, to make it operational, um, the technology has been very, very valuable and actually has enabled that, you know, so the modeling and the telemetry and the transmission of data, you know, necessary to actually operationalize, um, the distributions and abundance of various species, right up on the, on the fishing vessel, is almost, it is possible now, that's what John Manderson's been doing.

BM: Yeah, right.

TN: Right? So that is, that's very cool. And the, it was pretty clear that that was going to happen, started to present this stuff about five or six years ago, and so he's been able to really improve that. And so every year he's really trying to add a species or to continue that work, but a really important part of that, it does go back to the collaborations with the industry.

BM: Exactly.

TN: And we couldn't really do that without those sorts of collaborations and, and it's easy to do for some of our scientists, depending upon what they're focused on, you know? It's frankly very easy to do with the aquaculture group. And, you know, it's just amazing. Here it's on the, on the fisheries habitat side of it, it's more difficult because of that perception slash maybe misperception that the more science we do, the more uncertainty we uncover and then more restrictions they are going to be hit with.

BM: Right, right.

TN: And that's the, that is, I'll call it the myth. That's our challenge, to, to break through that and so a really, really important part of our mission has got to be education.

BM: Right, right.

TN: I was actually thinking, on the way in, about, you know, what am I going to talk to Bonnie about? But the kind of thing we would, we did eight or nine years ago, we didn't do it very well but it was better than nothing, um, in terms of outreach and education, we still, we're still doing the popular things, but for three years, every other year, you know, we held a seminar at Rutgers. I don't know if you remember that.

BM: Right, right.

TN: It really was something, I think it was something like Ecosystem Science in Support of Fisheries Management, I can't remember exactly what we called it. But that was actually a good thing.

BM: That was a great thing, yeah.

TN: It was a good thing, and, and you know we don't really have a staff to do it anymore. But that was the kind of work which, which at least put, you know, educated, you know, quote unquote the public, um, about, you know, what the science actually is intended to achieve.

BM: Right, right.

TN: And in some, some cases actually does achieve. And it isn't about uncovering, not, we don't want to uncover deep, dark holes. We want to try to fill the holes in a little bit with knowledge.

BM: Yeah, yeah.

TN: The holes are there no matter what.

BM: Right.

TN: The holes are, the biggest holes of those which are, are founded upon ignorance which is like, how we see in the politics right now. But, uh.

BM: Right.

TN: Yeah.

BM: Yeah, no, that's true. So you're not able, because of the decline in funding and staff, and staff, you can't really continue that kind of outreach at this time?

TN: We could. But it would be, we would have to...

BM: It would be a big investment of your time and your...

TN: Well, it's always going to be an investment of somebody's time. And we could do that, but it would probably be a little bit more expensive. Because it was easy to get the staff here, to coax them into going over there once a week to hold a talk, which was all they had to do. It's, it's much more difficult now because we don't really have the number of staff and so we would be looking more and more to partners and collaborators to do those talks. And, very possible, right? But then I don't think we can do it without offering some sort of honorary, or something, or just travel support. And so it would be very expensive. No, we could do that, you know. Would I have the time, I don't know, but you're right, this is, it is worth the effort.

BM: Certainly, as you're transitioning toward aquaculture, this would be something you'll, you'll be doing in an informal way, at least, in working more and more with industry, but you might want to consider it also.

TN: We had a meeting yesterday to talk about this sort of thing and, um, I know it would be difficult to get started here with the attitude that the staff have, I'm just going to say, you know, because they are so pressured to produce right now. And it's, you know, it'd be difficult to get them to take on more, but on the other hand, I've seen how successful this approach has been at, with the staff from the two aquaculture branches that are going to become one. And they're traveling all over the, literally, all over the country, particularly on the East Coast, to hold courses. One group just came back again from [name unintelligible] Point, because they were down there teaching them about, you know, in that case it was microalgae ecology or whatever it was. And so there was a, there's a much more directed, concerted effort by some really busy scientists at Milford, but the return is big. And, um, so it's a little bit of a culture change, I think, it's a mindset change that, that I think we will, um, experience here. I think it's not going to be trying to force people to do something that they

don't want to do, but it, it's going to be through this merger we're going to see that maybe the benefits of that sort of effort are worth it. It'll happen.

BM: With aquaculture, you have, you have usually a more receptive clientele, because they're people who really want to figure out how to do it better, whereas with fisheries, and I'm just--

TN: No, you're right.

BM: --my observations, that people in fishing industry don't see necessarily, I mean, they are, it's nothing they can really do themselves to improve their fishery, from their perspective. So it's hard for them to take time out to--

TN: It is.

BM: --to attend things like that.

TN: You know the, the closest thing to some of the courses which are being offered, and actually people from Rutgers come up, you know, um, a lot of it is focused on microalgae, but you know, at least once a year there's a microalgae course held at Milford for anyone who wants to for free. And the group goes around and does visit other laboratories to teach them the tricks of the trade. And there are also two seminars held by that laboratory. And I have to admit, that we at Sandy Hook should have been more responsive to that opportunity for example, to organize seminars on a regular basis and that sort of thing, so I think we're going to have to do that and we do want to do that.

BM: Have you, uh, the Hudson River Foundation holds seminars often.

TN: Right.

BM: Do you participate in those?

TN: Yeah, and so, part of the reason for not doing it is because there's less of a need in this area. In New England, with respect to aquaculture, they, there aren't as many sort of organized really science-based groups which were trying to do that sort of thing, so I think the Milford lab had to kind of step up if we're going to have. So it is a bit of a different situation, but, but you're right, you know, the, if we were to hold an educational program here, what would it be? And it's not probably focused only on the fishing industry, but it would have to be a combination, you know. We could teach people well, this is how you run a seawater experiment.

But that said, you know, one of the, one of the really big successes of the science center recently was the attendance and participation at this Marine Research and Educational Program. Um, it's not at all like the old seminars at Rutgers, but you know, this is the, one or two or three workshops each year which are held through the, and it's been mostly in New England, but the very first one in the Mid Atlantic was held here, a couple months ago. And so the MREP, the Marine Research and Education Program, um, it really is there primarily for the fishing industry. If, if in fact, almost exclusively. And it's organized by one of the New England Fishery Management Council members and, um, with support, with support from NOAA and the Cooperative Research Program. And it was, I was not here during that

week when they held the program, but it was apparently a huge success. Um, very well attended, and for several days they, they being the fishing industry, come together to kind of, it was kind of a stock assessment 101 course, but with add-ons.

BM: Right.

TN: And so John Manderson spoke with them and others here, to explain what they're doing and if nothing else, it helps the industry to understand what we've been talking about before, you know, what our real purpose is, um, why we're doing what we're doing, and, and that there are reasons why sometimes the quotas go down as well as up.

BM: The Garden State Seafood Association had, I know John was there and I don't know if anybody else was there, um, this winter there was a, there was a party and before that they had a whole day of seminars. It was really nice, yeah. And that was new.

TN: The, uh, yeah, they, there, there are a lot of organizations, actually, that, that sort of perform that role, in which we need to continue to be active.

BM: Yeah, yeah.

TN: And even though it's, it's frankly it's becoming difficult, because you know we don't have those many staff in the so-called Ecosystems Processes Division at this lab anymore. We're down to, I think at this point it's only like sixteen or seventeen or eighteen people for full-time permanent employment, you know, full-time permanent employees. Um, there are several more from other NOAA offices such as the Restoration Center and Damage Assessment folks, you know, Norb Psuty is here with six or seven or eight students, so they're very active. And then the Mast High School is here, so it's, it's--

BM: Right, right.

TN: --you know, it's never empty.

BM: Right, right.

TN: But the number of Ecosystems Processes Division personnel is really going down.

BM: Yeah, at one time, when you arrived, about how much?

TN: It was about double.

BM: About double.

TN: It really was double...

BM: Yeah, it really was double, yeah--

TN: I don't know the exact numbers but--

BM: --but it was more or less, yeah.

TN: --it's close to double.

BM: Yeah, so that's a huge decline.

TN: You know if you, yeah, if you look at the last 20, 25 years there's about a 50% drop. Collaborations are extremely important.

BM: Well, that seems to be the message all around because a lot of traditional sources of funding... and conditions have changed and so priorities have changed. That makes it.

TN: And the challenges are, the recognized challenges are bigger. I mean, if the biggest challenge of the past was well, how do you, how many rings are in this otolith, well, I can figure that one out with my student, but--

BM: Right.

TN: --the real question is how many rings, why are the number of rings on this otolith changing, in--

BM: Right.

TN: --this erratic pattern?

BM: Right.

TN: And what, and what can we tell from, you know, is, is this related to feeding nursery area, or what? And that's when it gets challenging, and that's when you can't do it anymore.

BM: Yeah, right. And you really need, you need interdisciplinary work to answer those kinds of questions.

TN: It, it's key to answering some of the larger, some of the larger, broader scale questions, but I don't, but I think one of the dangers that we run is that we shouldn't diminish sort of the, the, I don't want to call it reduct-, but I will, I mean you don't want to diminish sort of the more reductionist approaches that are really necessary in science; you want to integrate them.

BM: Yeah, yeah.

TN: And, um, a lot of our, I'm finding a lot of the ecosystem sort of, uh, cadre, you know, doesn't always recognize the importance of some of those various... detailed sort of physiological experiments that might be done in a small corner of somebody's laboratory.

BM: More mechanistic understanding of what's happening and so forth. It's, it's...

TN: Yes, exactly.

BM: Yeah, yeah. So, um, I think we covered the questions that I could see here. Um...

TN: Are you sure? Hopefully your tape recorder's been working.

BM: I hope it has been working. Have you been working, tape recorder? Hello?

TN: I wonder if she's going to do a sound check, that's okay. It is or it isn't at this point.

BM: No, it has been working. And, uh, so we've, we've just spent thirty minutes on the second half of this, so I think we've, we've talked about, um, trends over the last several decades, and, um, there's a question about what ways have the data that you used changed over time.

TN: Right.

BM: And I think we--

TN: Well, I think that--

BM: --touched on that.

TN: --the data that we're collecting, in some ways the nature of the data has not changed a whole lot. But the application has. So... especially several years ago, one of my messages to staff was, I don't want you to change what you're doing, but I want you to, when you write that paper, don't forget the section on applications. You know, we have to start to make that link to management to get the kind of support from with, from within our agency anymore.

BM: Sure, yeah.

TN: To continue that sort of work and so it, again, it, I don't, it's very often not the science or the quality of the science, which is sort of the limiting factor in, in, let's say, expanding this research portfolio. It's really getting the data to the managers, um, and to some of the stock assessment and, and, uh, you know, for the commercial fish species and also for protected species, and getting them to those experts.

BM: Right, right.

TN: [coughs] Excuse me, because at the moment, anyway, that's a higher priority for the agency, so we do have to be a little bit nimble.

BM: Sure, yeah. And, um, another, I guess, how did the advent of mathematical and statistical models affect the work here?

TN: It hasn't really that much. Because the data that we're generating, it is getting into the models to a certain extent, but probably not as much as, as we'd like. And that, sometimes the models, I, I don't want to be too negative, but sometimes the models are also a little bit of a, of a distraction. And I think that's one of the, one of the recommendations that we've, we've heard recently, reflects that. And that, you know, there's more data, uh, you know, in putting more data into an existing model or parameters, doesn't, clearly does not always improve the model.

BM: Right.

TN: But maybe we need to think a little bit more about new, more, more, let's say ecosystem based approaches, so rather than, again, rather than improving that single-species approach, maybe there are other ways to approach the stock assessments. And so I think the work here, it's, again, I don't think it's so much shaping the work that we're doing. We need to just get that, those data into the model du jour, so to speak.

BM: Yeah. So is there anything else that you had in mind, that you would want to talk about?

TN: Well, I guess just a couple of things that, just to maybe to reiterate or sum up. I mean, I do think that the work at this laboratory is, continues to be very, very important for the agency. I think sometimes the, we are affected by shifting priorities of the agency, and in more recent times, some of the funding challenges have not been related so much to a shifting change, but rather more accountability in terms of the types of funding we're getting. I don't know if anyone has talked about this, but, you know, the, the lines of funding that the Science Center has been getting are, were simply looked at a little bit more closely, and so there's a little bit more accountability built into that, and that has actually led to, um, some challenges with respect to paying folks to do the work that they had been doing, and in some cases, paying them with the wrong funds. Probably I shouldn't say that too loud--

BM: No, but I understand, yeah.

TN: --in this interview, but that's really what it is. So, it was not just the societal need that's driving what we're doing, but there was also some very, very specific, purely budget challenges.

BM: Yeah, right. So, have you lost flexibility then, is that what you're saying, in the use of funding, yeah?

TN: Well, we've, we never really had that flexibility, I think. Um...

BM: But you, you had been able to be somewhat flexible, more so, I mean this is the problem we have in changing accounting systems at Rutgers, too.

TN: Oh, really? Well, I...

BM: Much more clear movement from one point to the other...

TN: It's just, yeah, that's, that's pretty much it. And so there's less flexibility in the way we can spend funds and so that's, that's part of the challenge.

BM: Yeah, yeah.

TN: And, but I think the way to approach that, to, to, uh, to address those are integrate, be better at integrating the data we're doing into those higher priority, um, items. And at the moment that is very clearly three things. It's the assessments of commercial species. It's assessments of protected species, and it's also dealing with the broader scale oceanographic changes and how they affect those things and, and maybe some infrastructure challenges that society might have in the future. And so along with working with the industry, I think that'll be the way to, to regain some of the, regain some of the strength and vigor that we had 20 years ago. [brief pause]

I don't know if anybody talked about this, and I don't know if this is something for the interview, but I think there are two other things that we've been really bad at. Not so much this laboratory, probably, this laboratory's been pretty good. But I, I think we need to address, and that is gender diversification, across the Science Center and also, well, I, I guess I could say racial diversification, but diversification of the work force. The agency, let's put it in a, you know, a positive spin. The agency is, feels that it's really important. And this lab's done awfully good in terms of working with minorities from big institutions, um, and pretty good in terms of hiring women. Um, it's hard to know about the LGBT side of that, because, you know, it's pretty hard to figure out through interviews, but there's definitely going to, to the extent that we do have hiring opportunities, you know, we're going to be very, very cognizant of that.

BM: Yeah, yeah.

TN: And I think that we might slowly see a change also at the Northeast Fisheries Science Center, certainly there's a lot of talk, but I think it might actually move from just talking about it to doing something about it.

BM: This has been a general problem within marine science, too, hasn't it?

TN: Well, yeah. It, it has been, and, you know, it's, it's, I don't know how familiar, well you're probably very familiar with these, you know, these sorts of things; women supervisors versus men--

BM: Oh, yes.

TN: --some of the challenges that women specifically have, and then it's the same, and so, you know, the people of color, you know. It's, you're, they're, I know more about the, the challenges that, some of the studies about women. You're almost in like a lose-lose situation, you know, I mean, either you're not friendly enough or you're not aggressive enough. You're always going to be criticized.

BM: Hillary Clinton is a good example right now.

TN: Well yeah, exactly, exactly. I mean, it's like, you know, it's like, well, how do you, you know, how do you retain who you are and balance that with, with, you know, meet that bar that, you know, the Trumps of the world are setting.

BM: That's right, yeah.

TN: And, uh...

BM: And somebody pointed out, some people would say that Hillary Clinton is a conniver, but another perspective is she's a good strategist, but see those are two terms for the same kind of behavior. And the woman will more likely get the conniving one, than, than being a good strategist.

TN: Yeah, it's, it's very difficult for women. And it's, I can see that the Science Center as a whole is, is beginning to change, at least with respect to gender diversification.

BM: Yeah, yeah.

TN: I'm not so convinced that we're going to, that we're very good in terms of racial diversification.

BM: Yeah, yeah.

TN: But this lab's done very good. I mean, I don't think any other laboratory has done more than this laboratory in terms of engaging students that... [name unintelligible] is probably, you know, hosted five Ph.D.s, you know, helped five persons of color get their Ph.D.s, and, uh--

BM: Yeah, that's great.

TN: --it doesn't happen across the Science Center but I think it'll slowly start to happen.

BM: That's great. So you said there were two other things. Is that one?

TN: Well those were the two; racial--

BM: Oh those were the two--

TN: --the diversification.

BM: --racial and gender, okay, all right. One--

TN: And there may have been another--

BM: --the diversification, but--

TN: --but at the moment I can't think--

BM: Yeah, yeah...

TN: --of what it is.

BM: So it has, certainly this lab has done a lot, in moving in that direction toward, really--

TN: I think so, much more than--

BM: --the diversification.

TN: --anybody else in the Science Center.

BM: Yeah, yeah.

TN: And, uh, kind of have to, you know, when you're a satellite lab. You have to do things more on your own. Sometimes that's an advantage though, less scrutiny, but.

BM: Yeah.

TN: But, but Big Brother's become very big, so there's always some scrutiny.

BM: Right, right. One last question about, for you professionally, um, so you, you moved, you were in Europe and you were, you know, in Norway for some time and you were part of an international community of scholars. Do you feel, now, having been here at this satellite lab, that you're actively part of an international community? Are you allowed to act upon that in important ways?

TN: Well…well, I have been, yeah, but it's mostly because I never really, um, I never became less engaged with the ICES [International Council for the Exploration of the Sea] community, you know, than I had been, you know, when I was in Europe or Germany. And in some ways I've become more engaged, so. Yes, I was not interacting on a daily basis with international colleagues, but since I was, over the years either, I, you know, I've been in various committees, so for awhile I was the chair of the Habitat Committee for ICES when it still existed.

BM: Oh, were you?

TN: I was the chair of the study group on human interactions with the environment. I was on three or four different advisory committees there, many of which have now been disbanded and so I was, I think I was on almost all of them, you know, but the big ones would be the Advisory Committee for the Ecosystem, ACE, and then I was on the Advisory Committee for Marine Environment, and more recently I was on, when all of those went away and became, it was reduced to just two committees, an Advisory Committee on, um, Management, but the other one was the Advisory Committee on, or excuse me, the Science Committee, and so I was the U.S. representative on that for, I don't know, eight or nine or ten years. I just actually stepped down this year.

BM: Did you?

TN: Yeah. So there was always, there was always something going on. And actually what was kind of exciting is that in 2017, is one of the, with respect to international collaborations, in 2017 you should come down to Ft. Lauderdale--

BM: Yeah.

TN: --in September where ICES will hold its' annual Science Conference.

BM: In Ft. Lauderdale?

TN: Yeah, and so...

BM: Oh wow, I will.

TN: Amanda and I have been, uh, we're the ones that, that finally made that selection--

BM: Oh, great.

TN: --and so now I've given that to someone else to, to, uh, to continue to run with it, but all of the contracts are in place, but so that was good, you know, it was, so the U.S. is going to, will--

BM: I'm so glad because I used to--

TN: --be able to showcase what we're going to do.

BM: --participate in ICES when I had, I had a grant that gave me funding to, and I was, I've been on committees and so forth, but I haven't been able to do that.

TN: It'll be, I think it's going to be really fun, um, it's a little, they changed their format so it's going to be, instead of a five, full five-day meeting, they're going to shorten it to four days which may or may not be good, we'll see with respect to attendance. The Zika virus is not going to help attendance, I'm sure, people worrying about it.

BM: Right, right.

TN: But, I know where all the venues are, it's going to be really fun. And the science will be good.

BM: Yeah.

TN: It's going to be a pretty strong Atlantic States fisheries focus, and the other theme sessions, I, I mean, we'll see, you know. I definitely want to have at least one very strong one on sort of aquaculture and a changing environment. And we still have to also pick the invited speaker, you know, the, the host country gets to pick that speaker, so we will see.

BM: Yeah, yeah.

TN: Several people have indicated they'd like to be the speaker, but, um, but we're going to shoot, you know, shoot high. We're going to aim high to try to get the--

BM: Ray Hilborn, somebody like that.

TN: --the really good. Well... maybe. But it depends upon what the focus of the, of the meeting should be. I don't think it's going to be stock assessment, although, frankly, it hasn't had a strong stock assessment focus for many years, so maybe. Um, you know, it could be fisheries, it could be the link to the industry, I mean, I think a cooperative research focus would be a really good way--

BM: That's right, that would be very good.

TN: --these days, you know, and, and getting something like that.

BM: And the U.S. is pretty, has a lot to show on that regard.

TN: So it'd be a nice thing to showcase, and, uh, yeah, I think that would be a real twist. We actually had a theme session on cooperative research put into place last year with Rick Robins, he was the…

BM: Oh you did, okay.

TN: Well, yeah, I mean, Rick Robins and John Manderson from the U.S.--

BM: Right, right.

TN: --and I submitted the, the, uh, proposal which got, which, which was greeted warmly, but then we had to combine with two people in Denmark, so then it was Rick, and I said, "well, I'm going to go anyway", so Rick and John and two people from Denmark held the theme session last year in Copenhagen, and it was the most popular theme session at the whole event.

BM: Was it?

TN: Yeah. So I think we'll do the same thing next year--

BM: Good.

TN: --something like that.

BM: That's a great topic.

TN: So we'll see.

BM: Good. Well, let's, um, we'll conclude this interview, but I just want to thank you again.

TN: Thank you.

BM: I've learned a tremendous amount, and I think other people will too, and I thank you for giving us the time; we've spent a good hour and a half, um--

TN: Oh, you're right.

BM: --a bit longer than that.

TN: I kept looking, I was looking at the clock occasionally thinking we'd started at 9:00, but in fact...