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Merrick, Richard ~ Oral History Interview

Ruth Sando

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Voices from the Fisheries
166 Water Street
Woods Hole, MA 02543

Interview with Richard Merrick by Ruth Sando
Summary Sheet and Transcript

Interviewee
Merrick, Richard

Interviewer
Sando, Ruth

Date
June 15, 2016

Place
NOAA Headquarters
Silver Spring, Maryland

ID Number
VFF_SS_RM_001

Use Restrictions

Biographical Note
Dr. Richard Merrick is Chief Science Administrator and Director of Scientific Programs at NOAA Fisheries. He has a B.S. and Master's from Clemson University, two Master's from Oregon State University in Marine Resource Management and Biological Oceanography, and finally a Ph.D. in Fisheries from the University of Washington in Seattle. Merrick began his career with NOAA as a contractor in1983, working in Alaska and the Arctic. He then moved to the Northeast Fisheries Science Center and continued working for the conservation of marine mammals. Later, he became Deputy Center Director, then Division Chief. He began his current position five years ago.

Scope and Content Note
Interview contains discussions of: NOAA, NMFS, science policy, endangered species, protected resources, ecosystem-based fisheries management, climate change, climate science, ocean acidification, cooperative institutes, WHOI, OAR, satellites, underwater acoustics, noise pollution, copepods, cod, right whales, lobster, shellfish, Magnuson Act, Endangered Species Act, Marine Mammal Protection Act

Merrick describes his current duties, which involve overseeing the six regional science centers, developing science policy, advising NOAA and government officials, and building relationships

with other agencies. He discusses the history of NOAA and the changes he has seen during his decades-long career, and how the focus has shifted to climate change and ecosystem management. He details the importance of NOAA Cooperative Institutes, consortiums of universities that can easily collaborate with the science centers, and how he's encouraging scientists to be better communicators outside the science community.

Merrick spends time discussing how new technologies like satellite imagery and more recently underwater acoustics have helped conservation science progress and how climate change and ocean acidification are driving the work NOAA does. He also elaborates on the tangible impact climate change is having on marine species like copepods and the cod that prey on them, and acidification is having on animals with calcium shells like lobsters and shellfish, and explains how communities that exclusively fish these species need to diversify.

Lastly, Merrick emphasizes the difficulties that arise when there's disconnect between the states and the federal government, the regional offices and headquarters, science and management, or NOAA and Congress, and the importance of effective communication in addressing these issues. He also stresses the importance of partnerships in accomplishing projects.

Indexed Names

Baird, Spencer
Doremus, Paul
Grant, President Ulysses S.
Hollings, Fritz
Inouye, Senator Daniel
Kerry, Secretary of State John
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Obama, President Barack
Pingree, Representative Chellie
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Sobeck, Representative Eileen
Stevens, Senator Ted
Sullivan, Dr. Kathryn

Transcript

Ruth Sando: Alright, it's recording. I'm going to put it right here.

Richard Merrick: That's a neat recorder. I've never seen the mics like that.

RS: It's really, way more functions that I think we need, but—

RM: But it looks really cool [laughter].

RS: It does, it does. And obviously it's recording in stereo from both directions, and it can hold an awful lot of recorded material. And then I have my old one that I'm going to use as a backup because I'm paranoid. You know how it is with equipment [laughter]. This one provides really good sound quality, so when they transcribe it and then if they use snippets of it, it's supposed to be very, very good. So, let me just give you my little statement here to be recorded. This interview is being conducted as part of Voices from the Science Centers project funded by the Northeast Fisheries Science Center. It's also part of the Voices from the Fisheries project that's supported by the NMFS Office of Science and Technology. I am Ruth Sando, and today I'm speaking with Dr. Richard Merrick at the NOAA Headquarters in Silver Spring, Maryland. We're meeting on June 15th, 2016 at 2:00 in his office. Dr. Merrick is Chief Science Administrator and Director of Scientific Programs at NOAA Fisheries. He has a BS and Master's from Clemson University, two Master's from Oregon State University in Marine Resource Management and Biological Oceanography, and finally a Ph.D. in Fisheries from the University of Washington in Seattle. So you see, I did read your CV and your bio [laughter]. So, given my little introduction here, how would you describe your current role at NOAA?

RM: Well, I don't do science anymore. I actually develop science policy at the highest levels. So, if you look at my job, it goes several different directions. I guide basically 1,400 scientists that work in NOAA Fisheries at our six regional science centers, guide in the sense that I provide high-level policy advice or strategic advice to them. Right now, we're really heavily focused on implementing ecosystem-based fisheries management. So, one of the things I've done is make sure that we develop a policy and then a roadmap to implement that. I don't do it myself, I have staff that work for me. Just like I have all these 1,400 scientists out there, I have other folks at higher levels that work with me on this as well. So, I have a downward-looking role. I have a vertical role, so I provide advice to not only the NOAA Fisheries Administrator, but also the NOAA Administrator, Kathy Sullivan, on anything that relates to stewardship in the oceans. I also provide advice on the Hill, so on a pretty regular basis I'm talking to Hill staffers or Congressional committees, appropriators, on science issues that are relevant to NOAA Fisheries. And then I have a sort of lateral role where I reach out representing the fisheries or NOAA to other parts of the government. So, I build relationships with other federal agencies like BOEM - Bureau of Ocean Energy Management, or other parts of NOAA, or Offices of Oceanic and Atmospheric Research - OAR. I'm one of the co-chairs of the White House Subcommittee on Ocean Science and Technology. That laterally, we're reaching across a lot of federal agencies to coordinate their ocean science portfolios. So, it's basically I look down to lead these 1,400 scientists, I look up to provide advice to NOAA and to the legislative branch, and I look laterally to my partners in other parts of the government or outside.

RS: And how long have you been in this role?

RM: This role…I'm into my fifth year.

RS: Has it changed much? Is it always evolving?

RM: Yeah. Every—I think I'm the third Chief Scientist that they've had within Fisheries. For

quite a while, I was the only Chief Scientist in NOAA. The Chief Scientist for NOAA's position was vacant until about a year and a half, two years ago. But when I took this job coming from a background that was very different than my predecessors, I sort of recreated what this job could be like. The preceding two Chief Scientists were fish people, and so they had very strong backgrounds in stock assessment science. My background is very different than that—it's more in protected resources, so I spent the first half of my career working in Alaska and the Arctic on marine mammals there, on sea lions and seals. Second half of my career working in the Northeast on right whales, harbor seals and species like that, and eventually moved up within the organization so I was leading the social scientists and economists within the Northeast Center as well as the protected species people and the fish people. So, that's a very different background then the folks who had been here before, so coming into this, my perspective is really different. So, one of the reasons that I think we've made more progress in EBFM - ecosystem-based fisheries management - is that's really been more of my background than my predecessors. The climate work we're doing now—that's also mine and we didn't do much of that before. We've developed different ways of vetting or ensuring science quality within the centers. That's relatively new, and that's something that I brought in. I think this position is broad enough that any new person that comes in has some basic things that you've got to worry about, like leading those 1,400 folks down there, but you can recreate this position in an arena that fits you.

RS: Do you feel like you moved it in these directions because of your science background and the person before did not have that kind of a science background?

RM: I just think I actually hit it at the right time. Because I know some of the things that I'm doing now, my predecessors talked about it but weren't able to make much progress. But things are so dynamic now in ocean systems that we have seen this incredible recognition that climate is really affecting the oceans. Most of that has really hit our partners—the fisheries management councils, the marine mammal groups—the awareness of that has really come on the last three or four years. So, I've been in the right place for that, to come forward with a climate science policy for the agency now is really easy. Six or seven years ago, it would have been really difficult.

RS: Has that been matched by increased funding?

RM: Not particularly.

RS: No?

RM: No.

RS: It's just more awareness.

RM: Yeah. And we have the ability to move money around more now than we could in the past, so some of the things we're doing now, we've stopped doing other things and moved money from that to this—to the climate work. Some of it is just basically people just redirecting what they're doing. So, they continue to do what they were doing before but doing it in a different sort of way.

RS: Can you name something that actually was stopped in order for some of this other work to be picked up?

RM: We've changed surveys, for example. To me, we really needed to spend more time on ecosystem surveys, collecting basic information on the Gulf of Maine, on conditions there. We've backed off a little bit on some of the other fish surveys to allow that to happen. So, we have a fixed number of days at sea that we can deploy. If we're going to do another 60 days of ecosystem surveys, we have to stop doing 60 days of something else—fish surveys or protected species surveys.

RS: Given all that you have on your plate, I want to back up a little bit because part of the goal of this is to also talk to people about career development and their career in the sciences and then also in government. So, what inspired you originally—and looking at your CV, I see that you have a pretty broad base, maybe more so than some scientists—what inspired you to go into science?

RM: So, my undergraduate work was in architecture. My Master's from Clemson was in City Planning, and I was actually here—we moved up here from Clemson in 1973 to take my first job outside of school, and I was a consultant for about seven years and decided that really wasn't what I wanted to do. I wanted to be someplace other than in the computer lab in some city and I wanted to be outside, so it was a very sort of basic, sort of primal need. I needed to be someplace else. I was doing a lot of computer modeling, which was great—really cool, really excited me, but the lifestyle wasn't very good. I was making lots of money, my wife and I were doing really, really well, so we just basically decided to start over again. I applied to a number of schools, Oregon State accepted me, University of Washington accepted me, URI, and looking at programs in marine affairs. So, we headed out to Oregon not knowing where we were going to wind up, and as it turned out, we got to Corvallis, Oregon and we fell in love with the town immediately and never actually got to Seattle to see University of Washington until years later. That was the move that got us there, going back to the oceans. I had grown up on the oceans and it felt a whole lot more comfortable for me to go back to that. So, that was partly a personal choice in getting back to an environment I liked, but also this change in careers to something at the time I thought would be less stressful. Because in city planning, if you live here in D.C., it's pretty contentious. I was looking for something—I had this idealized vision of I could be an oceanographer and spend all my time on ships and dadadada, and it turned out that once I actually started my graduate program, the species I studied became one of those controversial studies in the Northwest, in Alaska. So, I slipped right back into the controversy, but in some ways, it felt a whole lot better. So, much of my career has been with endangered species. So, I got back into the controversy—and I was actually at that point, for some reason, it seemed to be a better fit than dealing with public meetings on city planning where people were calling me either a communist or a Nazi, depending upon [laughter].

RS: [Laughter] Well, I noticed you got two Master's, which is kind of unusual. What made you do that?

RM: So, it's hard to go from architecture into science. So, that was a transitional phase. They accepted me in marine resource management, and once they realized I was credible and I was getting good grades in the science programs in the College of Oceanography, I then got moved into the second major, or second program to get my Master's in biological oceanography. They were aligned—it was the same species, just different kind of science different kind of work to go with it.

RS: And then was it after that you came to NOAA?

RM: Yup. Actually, I graduated with the second degree I think in '85. I started doing contract work with NOAA in '83.

RS: Oh, so that was your introduction to NOAA.

RM: Yup. But I had wanted to work for NOAA for a long time, so that was…

RS: And how were you familiar with NOAA?

RM: I grew up on the ocean, it's hard not to be. One way or another, between—my family ran charter boats in Atlantic City, New Jersey, so we had experience with recreational fishery, not with commercial so much. But being around fisheries was something that I'd experienced for a long time. So, that was part of it, and the presence that NOAA had at that point was much less than now. We're much more regulatory than we were even in 1980, let alone 1960. But it's hard if you live near the ocean to escape NOAA, particularly now.

RS: Well, that's interesting. So, you sort of have a view of NOAA that goes back decades.

RM: I got here…I joined NOAA after they transitioned from Bureau of Commercial Fisheries for NMFS. That was a watershed for a lot of people, and most all those folks are gone, but it was a very—it wasn't just a name change, it was a philosophical change as well.

RS: Can you describe that a little bit, as part of the history of NOAA?

RM: Well, NOAA was formed by consolidating a group of federal agencies, and one of those was Bureau of Commercial Fisheries, which was plucked out of the Fish and Wildlife Service to go to this new ocean agency. But there was already a freestanding Bureau of Commercial Fisheries, and if you look at our labs, the Northeast lab where I used to work is the oldest of the labs. It was formed in the 1870s when Ulysses S. Grant sent Spencer Baird to find a place for a lab. He rode the train to the end of the train in Woods Hole and said, this is the place to do it. And they build the lab there. So, fine. That lab and science presence has been how most of our labs were created, and going up to the days of when Magnuson was authorized, our presence as a regulator was much less. It was when Magnuson came in that we began to see the managers really become a more and more significant portion of the agency.

RS: What period was that?

RM: Began in about 1976. It was Magnuson Act, Marine Mammal Protection Act, Endangered Species Act—they all came in within just a couple of years of each other, and prior to that, the agency was really just about counting fish. To a certain degree, how do you get more fish out of the ocean, how do we come up with better fishing gear. And so coming into the agency six, seven years after it was formed and Magnuson had been implemented, there was still this general mentality that we were trying to promote more fisheries. Recognize one of the reasons that Magnuson was enacted was to get foreign fishermen out of U.S. waters, so it came in at the same time as the Exclusive Economic Zone, the 200 mile limit around the U.S. coast, was put into place. In many areas of the country, we didn't have hardly any domestic commercial fishery. What was there was very coastal. In Alaska, there were enormous Russian and Japanese fleets that were fishing there—Magnuson pushed them out and there was a vacuum, and we promoted the development of U.S. domestic fisheries figuring that it would take decades to do it. As it turned out, it took less than a decade to make that switch, to go from a totally foreign fishery to a totally domestic fishery. So, Magnuson was great, it was a success. In some ways, that was the best model—it was great to be in Alaska at that time, to see that happen. One of my very first jobs was as an observer, so I got to go out on big foreign fishing vessels and see what that was like. I had never seen this enormous amount of fish that they would catch in one tow. I was used to small, kind of gillnet fisheries where you catch a couple hundred pounds of fish. These tows back then, which were relatively small, would be catching ten to twenty tons of fish. They'd pull the cod-end in up onto the trawl deck, and that cod-end was my height in diameter and fifty feet long, and was totally full of Pollock. Enormous fisheries, and we switched over within just a few years after that to instead of it being a foreign fishery, it became a U.S. fishery. And as that happened, we were able actually to control everything that happened there through Magnuson. So, a lot of people looked to Alaska as being an example of the best managed fishery in the United States—and maybe in the world—because we've had sustainable fisheries there, nothing's overfished, highly profitable for years, and probably it was that switchover. If you look in New England, they also had a big foreign fleet there, but there was also a big domestic fleet. So, they'd been posturing for years about controlling the fishery, so that community didn't exist in Alaska. The commercial fishery community for groundfish, for things like cod, really appeared as we made the switch through Magnuson. But in New England, it wasn't that way—there had been this long-standing tradition, two or three hundred years of fishing going on there. A very different approach to managing the fishery and that may be part of the reason that today a lot of stocks in New England are still overfished. I've been fortunate to be working both of those areas—working Alaska and working New England—to see the contrast. Within the fishery science centers, within the labs, the science we were doing before Magnuson was basically just counting fish. As Magnuson came in, then we went through this phase where we were trying to get more boats on the water, helping fishermen catch more fish. To do that, then we started to regulate so we began to see more and more management and the science get redirected now to feed the managers. I mean, that's good science-based management, but it changed the way a lot of the centers worked—it changed the way people did their science because they now had to be thinking about, I'm providing scientific advice to somebody, I'm not collecting data so I can publish a research paper. There's still difficulties with that, within some of the centers trying to convince scientists that the reason we're here is for responsible management. If you want to publish and that's the only reason you want to be there, you should be at a university.

RS: Well, I could see why that would have a big organizational impact. That change of purpose.

RM: So, we went from a situation where probably we had about as many scientist 20 years ago as we have now and basically no managers, to a situation now where we've got at least half as many managers as we have scientist—in some regions probably parity between the regional office managers in the center and the scientists. That's that big shift. So, I got to see that and it was really intriguing institutionally to see how an agency changes.

RS: Do the managers have a certain level of science background expected of them, so it's not such a big divide?

RM: Yes. Most of them have a science undergraduate and maybe Master's degree. So, if you look at the centers, you're expected if you're going to move ahead in the center you'd have a Ph.D., Master's is sufficient at the management offices. But they need to have a basic understanding of science. The difficulty is you need to stay with it to really understand a lot of the nuances and they have a tendency to fall behind, and they also have the problem that they're so focused on regulating today that it's difficult for them to think about ten to twenty years down the road. Whereas the scientists in the centers have a tendency to think about ten to twenty years down the road and not so much about today. So, trying to get them to harmonize is a constant problem.

RS: Huh. Well, you came to NOAA with two Master's and then I noticed from your CV that you got your Ph.D. after you came to NOAA. Is that common for people to pursue more education?

RM: No, it's not. I think there are some, and I wish there'd be more.

RS: Is it something that's promoted or not?

RM: Depends who's mentoring you, I think. There is the ability within the advanced studies program within NOAA if you come in with a Master's to go on to get a Ph.D. I did not—where I worked at the time, my mentor was not encouraging that, so you had to have somebody to actually support you to do it, because it cost money. The agency would typically pay for it, so what they did in my case was they gave me the freedom to pursue my research as part of my normal job, which wasn't very much different so it wasn't a big lift for them. By and large, most of the people who come in have their terminal degree at that point, and it's unusual for somebody in the regional office or the center to go back to school. We need more of that, but it's hard to foster because people are so busy.

RS: Yeah. So, it really comes down to the individual supervisors' attitude and support.

RM: Yes. There are some good leadership programs, like Leadership Competency's Development Program—that's a way that I think we're generating a whole new class of leaders. It doesn't do much for…it's not really focused on more technical training or science training, but that's one that everybody encourages. If you get somebody that gets into that, it's a kudo to you

as a mentor.

RS: Well, you mentioned the difficulty of trying to keep up to date with your scientific knowledge. Is there something that the organization does to support it, or is it just personal?

RM: Well, there's a lot of different ways you can do it, but one of the things we've tried to institutionalize is we now have a program that does a lot of different things, both developing new scientists within universities as well as for existing scientists, providing access to training, science training. The normal training that a federal employee has is about learning how to use Travel Manager, or how do you use Microsoft Word, and for most scientists that's not what they need. They need to know, how do I do Bayesian statistics? And if they don't have it, how are you going to learn how to do that? So, we have a program that we've set up that does regular webinars on science topics, so that's one way to access it. It also provides a series of links to training programs for science-based courses. They're taught at lots of universities, the places to go to, but if you don't know where they are, we provide the access to that. All the centers have a portion of their budget now that's set aside for training so individuals can take advantage of that, those programs. There's also a graduate and undergraduate component to that—we're putting within fisheries, we have a Population Dynamics Ecosystems and Economics Ph.D. Fellowship and we fund each one of those…it's competitive, but about half a dozen individuals a year and that's based on people applying through a university for that. We have staff—we're actually supporting FTEs and half a dozen different universities basically to develop students and Ph.D. and Master's programs that could be pipelined to come into here. So, we do those things to try to bring in more scientists and then once they're here to try to educate them. But it's a challenge.

RS: I was wondering about the linkages to universities. So, it's actually feeding into recruitment to some extent.

RM: It does. That's intentional. Are you familiar with Cooperative Institutes? So, NOAA has a group of university groups, a group of cooperative institutes, and each one is a consortium of two to ten universities who have come together and proposed to us on a competitive basis that they will focus on some theme that's of importance to NOAA. As an example, in the Northeast there's CINAR, C-I-N-A-R, which is a Cooperative Institute for North Atlantic Research. It's focused on Woods Hole Oceanographic in Woods Hole, but it includes University of Maine, the Gulf Maine Research Institute, Rutgers, the University of Maryland. Also, all those institutions are there together, they are there basically as a source of information that we can go to on oceanographic research in the North Atlantic if you want to go to an academic, to an academic source. The advantage is that they have a reduced overhead rate, so we can go there and it's easier for us to pass money there, so that relationship is simpler than if we were to go to another university—the overhead rate at the Cooperative Institute is about 50%, typically for a university it's closer to 100%. And the contract in our grant to go to universities is very difficult, for the Cooperative students, it's very easy. So, that's the advantage. But what we've done, some of the things we've done is we—most of the cooperative institutes that are aligned with my six centers, each one of them has at least one, that's where we fund positions. And we do it in different sorts of ways—at Scripps, University of California Santa Cruz or San Diego, we have a full-time FTE that we fund there with the idea that he'll develop students that are going to a Ph.D. program that

would be aligned with the kind of things that we want to do for ecosystem science on the West Coast. At WHOI, on the other hand, what we're doing is we're funding through them a position at the University of Massachusetts to develop Master's students in fisheries.

RS: Did you say "hooey"?

RW: Woods Hole Oceanographic Institution.

RS: Woods Hole Oceanographic…okay.

RW: Yup, sorry.

RS: No, that's alright. I just wanted to make sure it's clear.

RW: But we also focus on supporting researchers within Woods Hole Oceanographic. We fund three chairs there. Woods Hole Oceanographic does not have an education program, per se, but by having those three chairs funded, they're doing research that's aligned with what's going on in my Northeast Center plus they're available to students from the University of Massachusetts to be on their committees. And they're all specialists. So, we're looking to creative ways to align with the universities, and this is one way that it's been really useful for us.

RS: I would think the universities would be eager to have those linkages as well.

RM: Yup. University of Rhode Island have said that they're not part of that, so they're trying to develop their own Cooperative Institution. Which is fine.

RS: And has this kind of a use of consortia been long-standing, or is it a reasonably recent…?

RM: There used to be a similar sort of program that we had that just wasn't competed properly so our grants people made us redo this, and when we redid it, we did it on a bigger scale. Before that, there were maybe two or three of these programs nationally, now there's sixteen.

RS: So, when did you redo it?

RM: Around 2000, 2001.

RS: So, you have quite a bit of time to see results?

RM: Yeah, and they've accreted over the years. They're re-competed every five years, so new universities can come together and compete for that idea. So, we're just in the process now of re-competing the Northern Gulf CI, the Northern Gulf of Mexico—that was one that had been in place for, I think, ten years. Every five years we redo this, so right now there's a new competition so we expect to see a new grouping of universities coming together to compete for this cooperative institute.

RS: Have you seen many people come in as employees through these programs?

RM: It varies, due to the kind of program. I talked before about the population dynamics program—around half of those graduates wind up here, and the other half remain in marine science, they're going to academics. Within this other funding program, where we're funding staff, I don't have an exact count but every one of these programs has produced multiple individuals coming to us. We also have, NOAA has something called Cooperative Science Centers, which are basically focused on minority-serving institutions.

RS: Historically black colleges and such?

RM: Yeah. It varies by part of the country, because minority-serving institutions on the West Coast and on the East Coast are different. But the one we deal with most is Living Marine Resources Cooperative Science Center, which is based out of University of Maryland Eastern Shore. It has…I think six or seven institutions that are associated with it, and we have something like close to 40 individuals that have come out of that program over the last ten plus years that are now working for fisheries.

RS: So is this program—is it regarded successfully, as a success in terms of what it had hoped to achieve?

RM: I'm not sure how you measure success. I was on their last review. They are doing things that are good, but whether success is you want to have five graduates a year go into the government or not, that's a metric they don't use. Actually the panelists said," why don't you have a metric like that if that's one of your goals?" But if you look at these different institutions, they're all contributing to us in a positive way. We're getting student out of there, we're getting research out of there. Even the CSC, the Delmarva CSC, the one at the University of Maryland—that's actually become a really nice little focus for cooperative research in the Delmarva area, the University of Maryland Eastern Shore campus. They have—they're viewed differently by fishermen than we are, so they can go on the water working with some of these species that we need to get information on. It's easier for them to do it, particularly students. Fishermen tend to view them very differently than they would view somebody coming from one of my centers, much more neutrally. So, there's a lot of advantages to these programs, and to me it seems like the research we need to do within fisheries causes the focus on management restricts us to the things we can do. We get feedback from our partners—from the state agencies and from the councils—about why are you publishing papers? You should be doing more stock assessments. I tried to explain to them to move the science ahead, you've got to publish. But we have that constant tension, so it'd difficult for us to go off and do more abstract research. We can do that, though, by partnering with OAR, NOAA's Office of Ocean and Atmospheric Research, and with universities. We can fund the work there, and they can do some of the things that just from the optic sense, that somebody would have wondered what my staff is doing at my Northeast Center in Woods Hole, my folks in Miami, they get upset about. They don't get upset if it's at University of Miami and the works out in there. So, that partnership's really important—plus the partnership brings skill sets that we don't have. Given that we can't really expand our workforce a lot, we can't bring people on that are genomics experts, but we can talk to a university and get

that skill set there. So the partnerships are really useful for education, but they're also useful just for moving the quality of our science forward.

RS: Well, it sounds like it's expanded over time.

RM: Yup…I mean, a lot of the climate work we're doing now and the progress we're making there is basically because of the partnerships. We've developed really strong partnerships with some of the labs from OAR and going beyond that, we've gone into joint grant programs with them. OAR is basically the research arm of NOAA, so we've jointly put together grant programs for academics. We're now in the third year of a climate and fisheries initiative in the Northeast, and we have partnerships with a whole series of universities in the Northeast through that grant program. So, they're doing work that's even beyond our ability to do it, but they are short-term projects so, that's great. They can get in, they can do it, and get out. The partnerships are more now than they probably used to be, though I think basically we have tried to facilitate partnerships for a long time. Right now, it seems like there's a lot happening.

RS: Yeah. Well, it's interesting because you were talking about the lateral efforts.

RM: That's been a big part of my job, and it's difficult for me to evaluate how much of that happened with my predecessors because I know the first Chief Scientist, Mike Sissenwine, he was really focused internationally. So, he was very heavily involved with Europe and building partnerships that way. That's an area that I've delegated out to other folks. His successor was similar, but a lot of what he was involved with then was within NOAA they were trying to change how we approached doing our development of funding initiatives and how we structured the agency itself—he got very heavily involved with that, and that's passed by, so. There's a lot of things he did, they're not even relevant anymore because we don't do that stuff anymore. So, for me, when I was hired that was one of the things they really wanted me to talk about, was my ability to deal with partnerships. That's something I've done for a long time, this seems to be a natural job for this person here.

RS: I wanted to go back to the—you talked about coming in as a contractor originally to NOAA and then working on the science here. Your move from science to administration…how did that happen?

RM: That's tough for most people, because they don't do it consciously. I had a field program in Alaska from when I came on the agency as a contractor in '83 until when I left in '97. It built up over the years, and that was great—I loved being in the field. I was gone typically for six months out of the year.

RS: Outside [laughter].

RM: On ships, on islands, flying. It was really exciting, they had movies made about me…the other side, though, is you can't raise a family—at least as far as I'm concerned—and be gone six months out of the year. I had two young children and my wife and I at that point made another decision that we needed to switch. So, then I had to get out of the field, so I had to become more

of an administrator or manager. I moved to the East Coast consciously recognizing that I would not be doing the same sort of field work as before. I needed to manage a program—or develop a program, as it turned out. I moved into a group in Woods Hole at our center there that had ten people. I had almost as many people working for me in Alaska already as just a team. This was now a branch which is the next level up, who were a great group of people but it was basically people had been asked, "do you want to work on marine mammals?" And they just sort of plucked people from all over. The skill sets were not particularly good, but they worked really hard and they were doing a couple of things really well. But I came into that with the idea that I wanted to develop a program, and I was willing to step away from doing research on my own with the idea that now I could have all these people multiply my effects. So, it went form a program there that was basically focused on doing surveys of small cetaceans, and that was about it, with ten people—to when I left, we had forty people and the budget went from a million dollars up to at one point we were around 12 million. It's spread out, there' a major element that's all about right whale surveys, right whale biology, turtles, pinnipeds, seals…a much broader program. Creating that was exciting me. It's the same thing—this is just a continuation of that. Creating a program and then handing it off to somebody and letting them go and execute it is fun for me, because it means then I can go on and do something else. I almost have a very short attention span or something.

RS: You're not the operations guy, you're the creative formulator.

RM: No**.** That's the way I work. Making that kind of move was relatively easy for me because that's the way I work. I see a lot of other people, a lot of other scientists, who make that move and just are never very happy and they have a very hard time. So, one of the things I've thought about as I develop successional scientists, ones who are coming in to fill positions—it's a great idea to give them some time to be able to do this and see whether they like it or not before they have to commit. So, when I've rotated out and moved up to something, the way I like to backfill that position is rotating people through and give them a chance to see what it's like before anybody ever has to commit. So, when I moved out of that Branch Chief position, I first went through a rotation of all the team leads and let all of them have 120 day at it and see whether they likes it or not, and we decided in the end then to advertise the actually permanently full position, none of them applied—which was great. I hated not to have them there, but—

RS: [Laughter] Yeah, you can see that as a success or a failure.

RM: I thought it was a success because they had seen what it was like and they realized that was not what they wanted to do. But also getting a better appreciation of what it's like to be in that situation, so the next Branch Chief when they came in, in theory they could deal better with the Branch Chief. So, when we hired somebody, the individual actually came from outside of the center.

RS: So, then you moved out of the branch level, and then what happened?

RM: I was the Deputy Center Director, I was the Division Chief—I never was a center director, interestingly. People typically think that to get to this place, I would have been a center director

because this is basically the same skill set but at a higher level. That's the only thing I sort of missed in that accretion of duties.

RS: What would you say, in terms of people moving into administration, what's the biggest challenge in adjusting from working on science to working in administration? Something that you would look for in a person?

RM: I think it varies a lot, but it depends which of those jobs you're moving into. Your focus has to change. I look now at my center directors and people don't understand why they're not there all the time, and in my all hands, I've had to tell staff, now the purpose of the center director is to provide vision—that's the person that looks out, looks outside the center. The person building on the partnerships. The person who looks inside is your deputy, that's a different sort of skill set. As people are moving up, there are some that you can see, yeah, they're great to be inward-looking, they're very detail-oriented, and there are others that are the extroverts or at least the introverts that can look externally that make a better center director. Picking people to do one or the other should be a conscious choice on your part. So, as I'm hiring now for two new center directors—again, I've done this before—I'll be looking for that outward sort of visioning kind of person as opposed to one who's really detail-oriented because if you get the detail-oriented person into that vision job, they don't seem to work very well. It's a hard shift.

RS: Yeah, I've seen that, too.

RM: And that's hard because a lot of scientists by nature of being a scientist are detail-oriented. Maybe one of the reasons we have such a hard time finding good leaders and center directors is because they have to have a very different sort of vision.

RS: Yeah, I mean, you're actually relying on identifying somebody through personal characteristics rather than going through some sort of deliberate process.

RM: There is this deliberate process that gets you up to that point, but that's where I say, I can't hire any of these people unless I actually sit down and talk face to face with them and spend some time. Frankly, I would rather do that than allow them also to talk to their staff, so trying to—OPM doesn't like the idea [laughter], but there's a lot to be said…if you're going to hire somebody, have them actually go in the environment, spend some time there talking to the people they're going to lead, let them see what the person's like as well, get some feedback from them.

RS: Yeah, I can imagine that would be a little bit tough.

RM: It can be. There's lots of objections to it. I've done it. I haven't done it for the center director, but I'm going to try it this time around. A lot of my hires have been done that way. Academic hires are typically done that way—you would come in, you would do a seminar so everybody gets to see you and then the individual spends time with people there. That's something that I think we need to do more of in our senior leadership. I've been able to

successfully do it for everything from branch level and below. It's getting above there and getting—especially in SES, the Senior Executive Service, which is such an old boy's school…it's bizarre.

RS: Well, let me…thinking about all the scientists that you have reporting to you up the food chain, how hard is it for you to feel like you're staying on top of the state of science and where scientific knowledge is at any one time?

RM: It's easier for me to know what my people are doing than the larger question of what the state of knowledge is. I can do the former through a lot of the existing mechanisms. I receive on a weekly basis a list of all the pubs that are about to come out from each one of my centers, so I can see what people are producing. I meet on a weekly basis with all my senior leadership by VTC. I meet on a quarterly basis with—

RS: What's BTC?

RM: Video teleconference.

RS: Oh, *video* teleconference, okay.

RM: Sorry. Big screens, big tvs. So, I have centers in the Northeast in Woods Hole, Southeast in Miami, Southwest in La Jolla - San Diego-, Northwest in Seattle, and then Alaska, in Juneau, and then the Pacific Islands. So without VTC, it would be hard to talk to them. And then once a quarter, we all come together physically. We deal mostly talking about how we administer science and how we can do that better, and then some about science initiatives. So, I have a better handle on what people are doing. In terms of what science they *should* be doing—that's the hard part. To get at that, we have a series of initiatives, the goal of which is to develop new science. We have an advanced sampling technology initiative, and we have a working group with all the centers involved. We fund that at a level around three million dollars a year. That's done on a basis of competitive grants to the centers, so the idea is to generate new ideas. They can be small projects, they can be $10,000, or they can be two million dollars—depends on the project. We have for climate, I mentioned the one the project we have with OAR, we have multiple internal grant programs to develop new science on climate and fisheries, climate and the environment, climate and marine mammals. So, we have ways to do that. I got to rely, delegate down to the working groups that we set up to run things that bring things out. But we also look to the universities, the Cooperative Institutes, to bring new ideas to us. We work with the National Academy of Sciences and their Natural Resource Council—there's a standing committee there that we talk to on a regular basis. We have groups like under NOAA's Science Advisory Board, we have this group called the Ecosystem Science and Management Working Group, and I have them review the science we're doing on a regular basis on broad themes nationally. Every one of my centers goes through an annual science program review for some theme. So, we have independents come in and review what we're doing on some theme. So, next year, all the centers will be reviewed on their economics and social science programs—part of that is not only to look at science quality assurance, but what are the things that we should be doing? So, there are a lot of mechanisms to do that, but it's a lot more work than just keeping

your pulse on what's going on.

RS: Well, it's a huge amount of information to ride on top of.

RM: But science likes that—it grows and feeds by getting more ideas.

RS: Do you think that the stakeholders out there, and that's a pretty broad group, understand NOAA's role in promoting new science?

RM: Some do, but on the Hill they don't. Commonly, they're unnerved when we do things. So, when we rolled out our climate science strategy which basically was to develop new science that we can provide better advice to our management partners. Lamar Smith from…his first response is, this is another example of Obama's radical climate science agenda. We're just trying to provide better science advice, you know. So, there are some who are nervous when we do this. Where people typically see this is not so much in terms of the science, but the products. So, when we produce a new way of doing a fishery stock assessment, the fishing industry is very alert to that and they'll be very heavily involved in the assessment process in the sense of watching it. It could be a totally new kind of model, but they're more concerned about the outcome. So, if the outcome gives them more fish, they're happy. If you give them less fish, then there's something wrong with the model or the data that goes with it. One of the things that I've tried to do over the last few years is establish a stronger presence on the Hill for science for us. We basically had nothing, and so we've started doing, at least once a year, an all-hands briefing on some cool science thing. I'll bring in scientists from the field, three or four young scientists, give them a half an hour to talk. We've had packed rooms for this. So, we just finished one on new technologies with whales, basically. How do we find whales? How do we photograph them? We had one guy talking about using a hexacopter, which is a small, unmanned drone that he's using to photograph killer whales—incredible imagery of killer whales. Another young woman who's using passive acoustics, listening devices, to find where right whales are. So, people get really excited about that. It's all new stuff and they haven't heard much about it. So, we do that. We also have now a series of briefings, on a quarterly basis, with our appropriators to talk to them about the science that we're doing and the stock assessment, because that's such a big issue. Trying to educate them so they better understand what that science is like and what goes into it, and how we're improving it. So, we can reach out and do more—over the last few years we've done a lot more, we could still keep doing more. Scientists don't communicate well outside the scientific community. I'm pressing back on my scientists to become better communicators has been a challenge.

RS: Have they made an effort to use new types of social media and so forth to get out to the general public some of the information they're finding in regards to some of these big issues like climate change or the ocean?

RM: Yeah, we do. The coms folks here have gotten really good about this, and so we have blogs and we tweet on things when there's something happening right now. We had a new piece of equipment that we were rolling out—a new kind of drone on the other coast—and we were tweeting through the demo of the project. So, we're trying to use as much of that as possible.

RS: Is it successful in getting picked up in the press?

RM: Some of it gets really picked up. The biggest hits, based on our hits, we ever have around here on new postings on our website are typically the science ones. So, when we had a paper that came out from the Southwest Center on a fish called an opah. It was the first fish that has ever been found that is truly warm-blooded. That got an incredible number of hits when we posted the story on our website. So, somebody's paying attention.

RS: Must be hard to predict sometimes, what will get picked up.

RM: Yeah, well, we know that if it involves a whale…we can just keep putting up whale stories or shark stories and there will be lots of hits. But actually talking about the science part is a little bit different. I think there are folks here in coms that are paying more attention to who actually is watching and are they from the fishing industry or are they recreational guys, or are they academics, or are they college students, are they university students, and so on, and getting a better idea of what the market is out there.

RS: I wanted to spend some time talking about the drivers of change as you've seen them in science, and how that's affected NOAA. You mentioned that NOAA's mission itself has changed so much, and now it's become more regulatory but it's actually there's a lot of science involved in the data gathering. There's so much that's changed in terms of data and data analysis and technology—what would you say about the role that that's had in terms of research at NOAA?

RM: We're in sort of a different position than a lot of the rest of NOAA because we're so focused on living marine resources. There are areas of science that are a little bit different. Big data remains an issue, but generally our data sets aren't like what comes out of the Weather Service. So, the big data initiative within NOAA is really focused at providing that Weather Service satellite kind of imagery to a public out there, to consumers, who want to reprocess the information itself. For us, most of our data sets, if anybody's interested in them and it's a pretty small community. So, the data part itself hasn't been that big a deal. On the technology side, though, being able to sense things better under water has been an enormous driver. We've seen a series of waves of this happen. When I would do my Ph.D. work, it was being able to use satellite telemetry to track animals and also find out these things about the animals that we never really understood. We didn't know that elephant seals in California would leave the beach in Southern California and go immediately to the Bering Sea until we did tracking. We realized that males went totally different places than females go to and consistently. These animals would make round trips—they'd go from California to the Bering Sea, come back again, go back again, all within a season or two. So, this is all really exciting, but now that's just a standard old tool. Then, along came passive acoustics. Also, we found out you could hear things in the water, which we knew anyway, but we could put out arrays and we could listen to animals that we didn't know were there. So, we had a project in New England because we didn't know where right whales were in the wintertime. We couldn't find them in any of our aerial surveys. So, we put out an array off of Boston and found out there were whales all over the place in the winter.

We just couldn't see them because the conditions were so bad. So, now we've got passive acoustics arrays all around the coast. We're rivaling the Navy—the Navy has come to us, they want to know where our stuff is because we've got so many listening posts out there that, we're hearing their subs.

RS: Oh.

RM: They want to de-conflict that so we're not telling somebody where their subs are. So, that was a really exciting thing for a while. Now, we're moving into genomics and e-DNA and the ability to take a water sample and realize there's a whole lot more animals out there than we realized with the number of species simply by looking at a test tube full of water and doing the genomics processing. That's now coming on. But these are all things because we can't really see underneath the water very well, so we've got to have other ways to do it. That's from the hardware side, that's been a real continuing evolution of new technologies. On the science side, the real drivers are what's happening in the ocean with climate change, and it cuts across all the taxa we deal with, so, whether you're worried about copepods or right whales, the changing ocean is really affecting our ability to manage our trust species and protect them however necessary. Trying to understand those relationships all of a sudden becomes a lot more important. So long as the system was static and everybody had this vision that the ecosystem's reached its' equilibrium point and was oscillating about that and that equilibrium always stayed the same, you could get away with not doing some of the things we have to do now. Now that we recognize that that equilibrium no longer is there and that the system's actually changing in some way directionally. It's still got oscillation around that, but it's not coming back to the same point. We have to start being able to provide advice and do the science that lets us understand how these species are adapting—first of all, how they're affected by change and then be able to project the change and then be able to predict what the species are going to do. And that's a real challenge because there are not a lot of species that we've done this with. So, right now we're in New England…and a lot of this piggybacks on one taxa after another actually tells us more about something else. Looking at the lack of recovery of cod in New England—that's been a head scratcher. We thought a lot of that was being driven by overfishing, but even when we kept pushing down fishing pressure, the population isn't responding. So, now one of the hypothesis are that we've seen a real switch in the zooplankton community in the Gulf of Maine. Over the last hundred years, we've seen progressively warmer and warmer temperatures. In the last decade, it's really ramped up so the temperature's increasing rapidly—not so much that you would notice the difference if you wanted to go to the beach, but copepods respond to that. We've seen a change in the copepod community probably induced by this change in water temperature. There are things that feed on those, and one of the things that feed on copepods are small cod who like to have certain sizes of copepods. When that changes, they have less prey so there's less survival of juvenile cod, less cod then recruits to become adult cod. So, that may be one of the drivers for why cod is not coming back. Meanwhile, in the backdrop there's right whales who are also feeding on copepods and they also need the same sort of small copepod that cod do, and from what we're seeing the right whale numbers in the Gulf of Maine have declined sharply in the last decade. So, we're learning something from the research that started looking at cod to tell us something about right whales.

RS: Are you able to discern whether there's migration, or whether the fertility is depressed?

RM: That's always a question. If you see a change in abundance, is it because they've just moved, or is it because there's a change in reproduction or survival? So, we have to sort those things out. For a lot of them, it could be a mixture of those. So for cod, for example, they could be moving further off into colder water. There's not a lot of evidence of that, of an actual group of cod here moving over there, but what happens actually is that the conditions are better over here for cod survival, for cod reproduction. The animals over here do better. Right now if you look at cod in the North Atlantic, a decade or so ago, cod in the Barents Sea—there were cod there, but it wasn't particularly big—now all of a sudden there's an enormous biomass of cod in the Barents Sea, which is north of Norway. Conditions are really favorable there now for them, so those cod are doing really well. If you were to look at the cod in the Gulf of Maine or the Scotian Shelf or off of Canada, they're still not doing very well and it could be this environmental shift. In other cases what we're seeing is that they actually are shifting, so if you look off the coast of the mid-Atlantic, there are a number of species that are just extending their range—they're moving further and further north. The abundance is still high off of the Carolinas, but now there's a lot of fish off of New Jersey. Again, they're probably finding favorable locations to go, but it's not so much—they're not translocating. Right whales could be some of that, and again it's a species where there's only 400 of them. Trying to find those 400 animals in a great big ocean is difficult, so that's part of the research that would then get spurred by this. If it isn't a survival issue, then where'd they go to? We can look in Canadian waters and maybe that's where they've gone to. Again, but that's being driven by this same sort of situation. They're smart—they know that they can't find prey here, they have to go someplace else to find it.

RS: Does this—you know, what you're talking about is really a global issue—are there partnerships of scientists looking at this internationally?

RM: Yup. So, we have…the Arctic's a big issue right now. Again, we're going to see a record ice minimum this summer for the Arctic. There it's a situation where because there's so much more open water and the water's so much warmer, we may have the potential to A, see more boats up there, more ships up there, we have the potential there could be commercial fisheries up there. We don't know enough about what's up there to allow fishing to occur. On the policy side, we're moving towards an international agreement that we will prohibit fishing in the Arctic until we have the science that provides enough advice that we can actually reasonably manage or sustainably manage a fishery there and we also have a management organization in place. To get to the science, it has to be pan-Arctic. So, I'm chairing a working group that—we're on our fourth meeting now—is moving towards a pan-Arctic research plan to look at fisheries in the Arctic. It's so expensive to work up there that that's really the only way we can do it. We have to combine time on ships and so on. But it's a good example of how you can work together to do this. We have other mechanisms to do it—we have work going on in the Bering Sea looking at different ways to manage pollock in a changing environment and looking out thirty to forty years using predictions of what's going to happen to the Bering Sea. But that's a cooperative effort that we're doing along with a group of other scientists in Europe. So, this is through ICES which is the North Atlantic science…it's the International Convention for Exploration of the Sea.

Working through them, one of their working groups, to compare notes with what we're doing up there and what are the Norwegians doing in the Barents Sea to see if we can use similar modeling approaches. The climate change issue has really brought a lot of people together because it's pushing us much harder to come up with new science. But for a big driver, climate change and ocean acidification is number one for us.

RS: Climate change and ocean…?

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RM: Acidification.

RS: Ocean sidif…?

RM: Ocean *a*cidification.

RS: Acidification, oh okay. Yeah.

RM: So, we see a change in the pH. If you've got calcium in your shell, it's a problem. If you have calcium in your body. So, we have a lot of species that we try to manage that have shells—whether it's scallops or lobster, that becomes an issue. People tend to neglect that because they think more about loss of sea ice or warming ocean temperatures, but in some areas, that has the potential to have an equal impact. For the U.S., you look at some of the areas of the country, the fisheries really focus on invertebrates, on shellfish or lobsters. In New England, for Maine, that's 90% of the value of landings comes from lobster, and lobsters are vulnerable to ocean acidification—particularly at the larval stage. In New Bedford, which is our fishing port, the highest valued in landings, almost all that comes from scallops. The scallops are also vulnerable to climate, to ocean acidification.

RS: Huh. So, it's a huge economic issue as well.

RM: Yup. What some of the social scientists at the Northeast Center, one of the things that they've been focusing on is doing community profiles in general and now, linking back to that, their vulnerability to climate change through several different mechanisms. One is sea level rise. One we're adding now is the fish stocks that they focus on—how vulnerable are they to climate change? Because then the community if they're really focused on stocks that are highly vulnerable to change, the community's vulnerable as well. As a separate effort, we did an initial program to look at the vulnerability of all commercial fish stocks in New England to climate change. Now we're rolling that out around the rest of the country. The social scientists at the Northeast Center then took those results for the 80-some species we looked at and paired that up with the community profiles to basically assess, if you're in New Bedford, how vulnerable are you to change versus Race Point, which is this little fishing community around the corner? Race Point is in a far less vulnerable because they have a very diverse fishing profile compared to New Bedford, which 70% of their landings are scallops. Feeding back to the communities for the long term—if you want to remain viable, you need to be thinking about diversifying. You can do that in a variety of ways, and we can give some advice on that, but they need to be more creative. Aquaculture is one way they could do that, they can also diversify what fish stocks they're

fishing on, but they're going to need to make some sort of change. Maine is particularly nervous about this. We did a briefing for Chellie Pingree a month or so ago and this was really the whole thing she wanted to talk about, was how does Maine deal with these changes that they see are occurring in the ocean? And right now it's not a great solution, because this is the boom time for lobsters so it's hard for people to look past that—they're doing so well at lobsters. The conversation we are having with her was they need to have a contingency plan. What is the fall back if we start to see lobsters going downhill? It takes a while for a community to respond because there is so much in place that restricts their ability to respond.

RS: Oh yeah. Do you find that the information can get out to the right people? I mean, not just the politicians but planners and communities?

RM: It's hard. That's where the coms people are really helpful, but trying to understand a community profile or the networks within communities and how you best communicate remains a challenge to us, and it's difficult to walk into a fishery management council and tell them everything's going to hell in a hand basket, you need to change the way you do business. They've been doing it this way for a number of years and it's been successful—they don't want to change. We have things to learn, and having more social scientists in our community really helps, as well as coms folks. And it's probably the smallest of our disciplines.

RS: The social scientists?

RM: Yeah.

RS: And is that sort of historic, that it's always been the smallest?

RM: Oh yeah. If you look across NOAA, we've got three-quarters of the economists, probably at least three-quarters of the anthropologists and sociologists.

RS: Are here in this division?

RM: Are in fisheries. And we're about a quarter of the workforce. But we've had to have this in part because as a regulatory agency, we've got to evaluate our regulatory impacts. So, you've got to do an economic impact analysis, you have to do a social impact analysis—so that gave us the motivation to hire people. But we need a lot more. The money's not there to do it.

RS: How do you think—I'm assuming the money stays the say—how can you address that?

RM: If we think it's high enough priority, we can reprogram and try and convince people how high a priority it is because we have so many competing demands.

RS: Because it seems like once you're convinced, then there's this whole other challenge of moving that knowledge out to where it counts.

RM: And trying to convince the scientists that they need to have a real coms staff in each one of

the centers…can be difficult.

RS: A coms staff?

RM: Communications.

RS: Oh, communications staff.

RM: They have the tendency to think that you can take a biologist and call them a coms person and they'll be able to do the job right. I've had some interesting conversations with senior leadership about that. Even the higher levels within NOAA, they don't quite get it, that it is a real skill that's learned over time and takes a lot of experience to be able to do it right. If you're a biologist—it's sort of the same logic that when I would charter an aircraft, I charter pilots. I don't charter a biologist to fly the plane; I wanted somebody that's a pro to do this. To me, it's conceptually the same sort of skill set. Not everybody agrees with that [laughter].

RS: I know, I've seen that [laughter]. I wanted to ask you about the relationship—because you alluded to this—the relationship between headquarters here, and you came from the field yourself, and the field offices. How would you describe that over time? Has it always had a certain quality? Has it gotten better or worse, or is it tighter or looser?

RM: I think the field has traditionally been out on their own, and they expect that. They don't expect much guidance from headquarters. When you develop a stronger headquarters presence, it becomes difficult.

RS: You mean there's pushback?

RM: Yeah. They think we're intruding, we think they're not listening [laughter]. The place I try to get us into is getting them to realize—and it's even within here, within this building—that we have…this is the F suite, and we have a group of people here, maybe 100 people in the F suite which is the senior leadership and all the key support groups with a management budget, and communications, and media affair. There are also in this building a number of offices for NOAA Fisheries, Science and Technology, Protected Resources, Habitat, Aquaculture. Even within here, we have this same sort of problem—that they don't communicate very well, we don't in general take advantage of the skill sets that each side has. And the further you get away from here, the worse it gets. So you get to Alaska, they figure they're on their own. They don't ever need to tell us anything. Pacific Islands is sort of the same way. Yet, time after time it's really clear that if they don't tell us about things, it causes a problem. Conversely, if we don't keep them informed, they don't know when to tell us about things. That's a challenge. I started to say before, today we had another one of these sort of blowups of somebody coming to us with a very well-intentioned concept and again, they didn't realize that this is something that we could really help them with. So, it was a really naive approach to a really big problem that by involving Eileen or the Administrator or myself or my peers, that we could really change the way they can do business. So we basically had to tell them to go back to the drawing board and think about it, think more strategically think how we, the senior leadership, can help you do these things. In

some ways it's worse now than it was 10 or 15 years ago because headquarters, it's already more of a pressure. There's so much oversight from the Hill that we have to keep them so much more informed. That makes it much more difficult—the whole idea of no surprises. Let me get some water, I'll be right back.

RS: Ok. Let me—I'll just pause this. Well, I'll let it wait.
[pause]

RM: Back again. So, I looked at my predecessors, the people who were here when I stepped in here. Sam Rauch, I'm not sure who you're going to talk to here—

RM: Yes, he's on my list.

RM: Okay, so he's my equivalent on the regulatory side. He was the only one that was here before me. So, of the four senior leaders here: Sam, Paul Doremus, who's the Deputy Assistant Administrator for Operations, and then Eileen Sobeck who's our boss. We're all new, essentially. This is a really good team, I enjoy working with them all. I think great ideas, trying to move the agency in the right place, we're trying to get people to do things that have been neglected for a long time. Probably, from my perspective, if we'd had this sort of approach 20 years ago, some of the problems we're having in coms right now we wouldn't have. We're trying to educate everybody on how to do things, and there's resistance but people are learning and we're getting better and we're reaching out better to the Hill, talking more to the Hill—why weren't we doing that ten years ago? We just seemed to ignore them. But the communications between the field and headquarters has always been awkward…I'm hoping it's better, getting better. Coming from the field to here, that was one of the things I was able to talk about. I understand what it's like to work out there and now I understand what it's like to work here. So, that's one of my jobs, is being able to bridge that and being able to talk to people. I wish it wasn't such a problem. In some ways, the bigger problem is the communications between the scientists and the managers in the field. It's nice for me—I can just walk over and talk to Sam, he's right next door. We meet on a very regular basis, so I know a lot more about what's going on in the management side of the house than my peers or my staff do in the field. The center directors know about what's going on in their regional office. That's a problem, to me it's a much bigger problem. And this issue of the scientists producing the science to support the managers remains a big problem. As we've gone through these science program reviews every year, one of the goals of that was, that's part of the terms of reference was, is this center producing the science that the managers need? In the first couple of years, we couldn't get the managers to come to the meetings.

RS: [Laughter] So basic problems.

RM: So there's that problem, yes. In the last year or so, though, we've really leaned on the managers that they've got to be there, and that's really changed the complexion of the meetings. This year, it's been really successful because this year we're seeing the senior leadership from some of our regional offices spend the whole week at the program review. The conversations that occur—first they get educated on what the science is, then the panelists is talking to the

managers throughout, this is a panel of five or six externals, they're talking to the managers throughout the time—does this match what you need? And what were the gaps here? And that dialogue, there's no good place for that to happen, so this has been really useful to see people actually talking to each other. I'm trying to promote that more. I've told every—I now have all my center directors meet with their regional administrator on a regular basis, usually every two weeks, have a conference call minimum every week. The deputies do the same thing, so we're really trying to bridge that gap. But there's culturally, they're just so different. Part of it I'm convinced is this timescale issue—the regional offices, the managers are worried about this year's quota and it's hard for them to think two, three years down the road, yet the centers are pushed to do that, they have to think on a longer timescale. Trying to get those two to communicate better on those timescales helps.

RS: Do you see the field offices remaining the same in terms of the structure in the organization, or is there a…?

RM: Internally, or externally?

RS: No, internally.

RM: I didn't ask that right.

RS: I mean, a lot of times headquarters has these ideas about field offices and that evolves over time, with or without input from the field office.

RM: That has changed some since I've been here, but the tweaks have been small. When I originally went to work on the other coast, there was one fishery science center that did Oregon-Washington-Alaska. They split that up basically the year I became a full-time employee to make two. So, that kind of thing happens. Now they have taken the two West Coast regional offices and made them one West Coast regional office. Usually the reasons for these don't make a whole lot of sense, but we do these things as a federal agency. But I don't see much of that changing because we're so regionally focus that, at least for my science side, every one of the centers has a different sort of focus for their research and it makes it difficult to try to combine. Where I see that we have got problems is where we do have multiple groups within the same center with really different focuses. In the Southeast, there are six labs that are spread from over in North Carolina to Galveston, Texas. The problems that they're dealing with in Galveston are fundamentally different form the problems in Beaufort, yet they're supposed to come together as one group. Not only are they a long way apart, so it's hard to manage, but culturally they're very different. It's almost like we should have—we should split them back up again and have the South Atlantic folks be one lab and the Gulf ones be another lab. And then they also have to deal with the Caribbean. But we have no appetite to create more labs, we're basically stuck with this. So, it becomes more—I said external or internal—are we organized *internally* in the proper way to deal with these sort of issues across regional cultural issues or the distance to get to these places….so that's a lot of what I've tried to focus on in the last couple years, is to get a couple of these centers that are spread out like that to go back and evaluate, are we properly organized internally? So, the Southeast is going through a major review on that, the Northeast has just

finished their review and they are reorganizing. Physically, it won't change that much, but within the table of organization it'll look different. Hopefully, it will work better in part because things are changing and I think the organization that we've got now that was developed in the 1970s may not be appropriate for this century.

RS: Well, that's what I was wondering. Particularly, like you talked about, Alaska and then you talked about the challenges there and having an international agreement to cease fishing. Do the field offices play a role in any kind of international issues like that?

RM: Yes, they do. It's basically regionally specific. With respect to the Arctic and the international components to that, there in Alaska they deal with U.S.-Russian politics, by and large. Because there's a natural pairing there that we can do research together. If it comes to be really pan-Arctic, a lot of that comes out of here because it's a lot easier for us to work with the State Department than it is for somebody that's in Juneau. But when it comes to science organizations, pan-Arctic science, what I try to do is keep the scientists involved. So, this workshop that I'm chairing—I and an individual from Norway will be the overarching chairs, but actually the science chairs, one of those will be from Alaska and one of those will be from Norway. With respect to ICES, the International Convention for Exploration of the Seas, the Artic working groups there are staffed by people from my centers. So, to me there's a role for headquarters because we can do some things because we're here in D.C. There's a role for the field because there are things that they're ideally suited to. It's those things in between—we just have to sort those out on a case by case basis. All the centers have an international role, so the question then becomes, how do you deal with this overarching international need? Should you have an international person within each center? Usually it winds up that there is somebody who is like that, though they don't put them in their table of organization that way. So, that could be a skill set that you would expect to see on the table of organization in the directory, the national affairs officer. The need for outreach is so much greater than it was 20 or 30 years ago, so that's one of the reasons I promoted the idea that you really need to develop communications staff within each one of the centers. Having a chief of staff to the center director to deal with all the stuff that's coming in needs to be there. I've actually given them money, a couple of the centers, to hire chiefs of staff because of that. It didn't use to be like that, but there was a time I think a lot of people think those are the good old days where every Friday afternoon the center director would put his feet up on the table and pull out his bottle of whisky and put it on a table and start smoking a cigar, and then he'd reminisce about the good old days—that day isn't there anymore. But the organization looks the same, they haven't really responded to that.

RS: Thinking about issues like sequestration and the ongoing budget pressures—do you feel like the huge expansion in the issues involved with the oceans and marine life and just NOAA in general, that budget becomes a huge issue?

RM: You can dwell on that and think that's a huge issue, but the flipside is I've got close to $500 million dollars to do my stuff. I've got five big ships that I know I can rely on, and another three or four ships that I get part-time access to. I've got incredible resources. You'd think that we could be doing—and we've got the biggest set of resources of any country in the world. It's not like we've got the biggest EEZ. We can do an incredible amount without more resources.

The hard part is deciding how do you prioritize and stop doing things? That's difficult, but that's the choice here. You just can't keep adding things on because you don't get more money. Something's got to come off the table.

RS: But it sounds like there's a lot of voices.

RM: Definitely a lot of voices. How you prioritize those things you're going to do is tough. We've been working on that and we have a couple trial runs of this, one for how we prioritize our stock assessments within a region, and another for how we prioritize our ship use. Hopefully, they're as successful as they're seeming so far, we can use that, spread it out more broadly as to how we prioritize other things. I have a framework now within all the centers that's pretty rational as to how they prioritize their resources. The awkward part in the end is how you decide what becomes number one. There are ways to do that, there are experts out there, again, who know how to do these things and part of that is getting the policy makers to actually say they're going to weight—weight in the sense of w-e-i-g-h-t—weight their policy choices, that one thing is more important than another. That's a challenge. They want to do it, but then when you ask them to do it, they frequently back away from it.

RS: I wanted to go back to another thing you mentioned, especially thinking in terms of the political side of it. Since NOAA has evolved into more of a perceived regulatory force—

RM: It's Fisheries.

RS: -- Fisheries?

RM: NOAA at large is not. Most all the regulatory capabilities is within fisheries.

RS: In Fisheries. Is there—has that become an impediment to working with the ultimate recreational fisher, commercial fisher, whatever. Has the viewpoint changed?

RM: I think so.

RS: So, in the long run, is this an issue that NOAA's going to have to deal with?

RM: Well, we're successful, like in Alaska, and the fisheries are healthy and everybody's doing well—there's no real issue about it, every once in a while something will pop up. Areas where their stocks have been traditionally overfished and we're having to restrain effort because of that, it's a major problem. So, in the Gulf of Mexico and New England in particular. Those two areas that we have a very difficult time working with the industry and they continually tell us we don't know what we're doing, models don't work, the data isn't any good. All that is collected exactly the same way as in Alaska, where Alaska is really happy, but their stocks are healthy. A lot of that's communications and we continue to try to develop new ways to deal with our partners and try to better explain the need to be conservative in harvesting. Where it becomes more difficult where it gets into the Hill and they become involved.

RS: Oh, you mean the feedback reaches the Hill?

RM: Yeah. When it goes through constituents. Right now as we're talking, the Senate appropriations is considering a rider that will remove management of red snapper in the Gulf of Mexico from the feds and give it to the states. Fine. That's our biggest headache, in some ways that would be great. The problem is that while they're saying they're going to do that, they're still going to expect us to provide all the science to support it. So, it's not going to be as clean as we would like. But that's become very controversial.

RS: Would that be accompanied by moving some of your funding to the states? Or would the states have to do it for free?

RM: Well, yeah. What they have done now is there's a $10 million dollar line, there's language for $10 million dollars that's in this '17 appropriation coming out of the House to do assessment work on red snapper in the Gulf of Mexico. Basically what they want us to do is put it out to somebody other than the feds, the $10 million dollars, and do it through a grant program so the states could be involved, the industry could be involved. The awkward part is that they haven't even given us $10 million dollars to do it. They've given us $5 million, they told us to spend 10. So, we've got to find $5 million dollars someplace else to do that. But there's a way that the states can get the money. How do we reconcile Magnuson and the management of the stock in federal waters with state managing this and potentially doing the assessment? It's a little unclear.

RS: Well, that brings up another issue, and that is what tends to be—and this is a broad question—but the relationship between the state and their regulators and government people and NOAA on common issues? Do you have to establish sort of alliances, each coastal state?

RM: Well, from the management side, the states sit on all the fisheries management councils. The Gulf of Mexico Fisheries Management Council has all five of the Gulf states as members of the council. So, right there there's already participation by the five states. It's a head scratcher about why—what's wrong with that process? They have a process by which the states already are managing it. There's also the Gulf States Marine Fisheries Commission. Again, who [unintelligible] the state fisheries compact that has the potential to manage fisheries in the Gulf of Mexico, has all five states there. So, that's another place where we partner with the states. We have regular meetings with the state directors and work with them through that. We have individual projects with those five Gulf states. We fund research, they do surveys we fund. You wonder are we just not telling the story to the Hill in an appropriate way…I think that's part of it. That's why we started this quarterly briefing with the appropriators, but it still hasn't gotten through to them. I'm not quite sure whether we're just not telling the story right or whether it's the voices they're hearing from their constituents are so much louder that it doesn't really matter what we say. I think there's some of that. But nonetheless, we try and we continue to try to develop a strong relationship with the states for science and for management.

RS: It's a challenge at least [laughter].

RM: That's what's nice about working in Alaska where you just has one state. Even there was a

problem at times. They decided they didn't like the Endangered Species Act, but we have lots of endangered species issues in Alaska and we need to coordinate with them and they'll take the money, but they don't want to do the work.

RS: And then the end result there's no report, there's no nothing, it's not done.

RM: Yeah.

RS: I think I've gone through a lot of the issues on government and science. Another thing I wanted to ask you about is going back to the issue of bringing people on board and replacing knowledge over time—do you find that, do you believe that government is a competitive hire at this point? Is it an attractive career goal for people?

RM: For biologists, yes. If you're interested in conservation, there's probably no better place to be. If you're in academia, you can do lots of really cool science, but what the contribution is there to conservation? It's not clear to me. You don't have any power other than by publishing. Here, you can actually do things. It's frustrating, and conservation is really frustrating. The councils with all their, all the warts that people see in them are an incredible exercise in democracy. It takes a long time to do anything, there's a lot of yelling, there's a lot of pain, but that's what democracy is. We're the only place in the world that really does this. There are people that recognize that it's a good process that makes sure that we don't wind up in a situation like they have in Europe where some central federal body makes all these decisions. But for somebody coming in as a conservation biologist, they want to see how conservation really operates—you go to a council meeting and you see that. To me, I mean, I've been sold on this for a long time, but not everybody sees it the same way. But for biologists, where else could you go where it's so exciting?

RS: That's good to hear that.

RM: I've been incredible places, and being in the federal government has been great. I'm happy—I look back on my 30-some years with NOAA and I think this was an incredible ride. I'm glad I did it. I have no regrets. With all the battles I've been in over the years, we've done some incredible things. Seeing right whales recovering…seeing stellar sea lions, my first big species, see the population stabilize. We couldn't have done that from an academic institution.

RS: Tell me another one that you would look back on and say that was just a real achievement.

RM: Technologies. Getting passive, getting a real acoustics capability within NOAA. It cuts across lines. When I moved to the Northeast, we started a tiny little project with Cornell—we put out one buoy to see if we could hear whales in New England because I had right whale money, I thought I'm really nervous about flying so much, there must be a better way to do this. The Navy told us you can't hear right whales, but we just decided to try anyway. Lo and behold, we could hear them. That's blossomed to the point now where we've got acousticians in all the centers, in most cases, real staff—not just one person. We've kept building on that, so we have a science capability, but when six or seven years ago we decided that what do we do next? We decided

that we really need to have a bigger approach to how we deal with noise in the oceans because we're starting to see from the acoustics work we are doing how animals respond negatively to all this noise—whether it's seismic activities or Navy sonar or ship noise, it's having a negative impact on animals that need to hear and communicate in the oceans. So we started four years ago working on a larger ocean noise strategy, and are now, we started rolling that out this month.

RS: Was that part of the discussion about coastal wind farms?

RM: Not directly.

RS: No? Because those do produce some noise, don't they?

RM: Mhm, not like ships do. The level of noise in the oceans is increasing by, overall the ocean, by one to two dB every ten years. That's, each dB, is an order of magnitude. There are animals like large whales who really need to communicate. When a big ship goes by, they just stop talking. You have cod who communicate as part of their spawning, same thing happens there—it obscures their ability to communicate. The agency, other than what we had to do under the Endangered Species Act, the Marine Mammal Protection Act, was basically not doing anything about the issue of noise. Now, we're actually stepping up. We got a strategy for how, at least starting off within NOAA, how we're going to deal with noise and organize our strategies and then come up with ways that we can promote through the IMO, better ways of reducing ship noise, dealing more with the seismic industries so there's quieter ways of doing seismic activity when you're looking for oil and gas. That's a big step forward for us.

RS: Is this an issue that's been recognized internationally as well?

RM: Yup. So, there's a companion effort going on in Europe right now with the EU. For the science community, it's been recognized internationally. On the governance side, very little has happened. So, we're right out there on the forefront.

RS: Is that a communication issue?

RM: In part. I don't think people are quite as aware of the effects—I don't think they're aware how noise is increasing in the ocean so much, and I don't think they're aware of the effects that it has. One of the things we're doing is we're actually establishing in U.S. waters an ocean noise network, a reference network so we can actually over the long term keep track of changes in ocean noise and see, is this having any effect? Are we actually quieting ships? Is that reducing the level of noise? That's the first step to do that, and that's a key part of that, trying to understand how much noise there is.

RS: When was it that you first put that buoy out in the water? How many years ago was that?

RM: Around 2000.

RS: Oh, so this whole issue is really new.

RM: Yup. And 2000, 2001 there was—I think NOAA had one acoustician. That person was here, and he and I talked about this and said this is a protected resources issue. That was the genesis of—you know, we probably should figure out a way to get an acoustics person in each one of the centers, and that took until almost 2010 before we reached that point, and then all of a sudden, it's exploded.

RS: So, once people were paying attention to the issue and there were people there to pay attention.

RM: Everybody did, yeah. When I did my Ph.D. work, a lot if it focused on tracking, animal tracking. We wanted to use satellite telemetry, so it's sending a signal from analog up to the satellite. My research assistantship was working with large whales, and the big problem there is you've got to get them to stay on the animal, and we didn't have a really good way to do it. But we knew we could put radio tags, little radio tags, on sea lions just by gluing them on. So, my Ph.D. work looked at putting satellite tags which are much bigger at that point—they're about like this, about that thick—on sea lions, which are really big animals, working with animals bigger than this table. And because you can just glue it on, the biggest issue there is trying to capture the animal. So, when I started that there were no active deployments of satellite tags on any marine animal. There were lots on bears, because you just put a collar around their neck, now wolves and things like that. Today, it's an incredible useful and commonly used tool but we were working with stellar sea lions and Alaska was concerned—they were afraid that because the population was in decline so much, that we were going to close fisheries. So Ted Stevens, Senator from Alaska, got us a special appropriation so we got enough money that we could actually ramp up the research program. That gave us the money to invest into the satellite telemetry and that just moved that whole technology immediately ahead. It had been sitting there for marine animals for a couple decades, and nobody had made any progress. But we get this big infusion of money and all the problems we had could overcome within just a couple of years. It was because we had so much money and we could afford to put $4,000 instruments on an animal and lose them. If they didn't work, the biggest issue was *why* didn't they work—it wasn't so much that they fell off or we lost it, it was trying to learn from those experiments. Having an infusion of money like that was the same thing as acoustics that we were able to move thing ahead really quickly because all of a sudden people realized we'd overcome a lot of the technical barriers, and it's a really useful tool.

RS: You know, I used to hear that Senator Inouye was also really good about getting appropriations for Pacific marine issues. Are the people on the Hill—would you count that there's any that have that level of interest now?

RM: They're not there anymore. Meaning that you look around, the way it used to be and we have Hollings Fellows, that's our big undergraduate science fellowship program for the centers, that—Fritz Hollings was gunning for that and he's gone. Warren Magnuson, the Magnuson-Stevens Act, they're both gone. Almost all of the great proponents for ocean science, ocean management are gone. There is no one that's really replaced them. There are people who have stepped up to become involved, they're all special interest. So, we don't have people who are

looking out over all the oceans. Kerry had some of that, and he's actually picked it up for the Arctic, so he's a big proponent of the Arctic, any oceans in general, but he's no longer on the Hill. Being in the State Department, that is great that somebody's hosting oceans conferences and arctic conference, but it doesn't help us with appropriations.

RS: Wow, that's a huge issue. Huge change. Well, I've got a few more questions, I know I'm going to run out of time.

RM: You've got about five minutes, sorry.

RS: Okay. What advice would you give somebody who would be starting out, developing a program, like you took over from here? There were certain things that you felt not timely anymore, or needed to change. What advice would you give somebody who was in that position of taking over like yours?

RM: There's a couple different questions there. How would that person decide what should the program do?

RS: Actually I'm thinking more from the political side. How do you get the wherewithal to actually have the accomplishments? Some of it's going to be—

RM: It's all about partnerships, one way or another. One of the things I did out in the Northeast was I spent a lot of time finding money. Remember I talked about the program I came in around a million, I got it up to around 12 million. It was clear that we weren't—for one reason or another, they couldn't compete, so we found out ways that we could compete better on grant programs, and that's kind of a partnership. I also found that we had partners out there who were willing to send us money. So, I developed a program with the Northeast Center with BOEM so the center now gets $3 million a year from BOEM to do surveys, because we couldn't get the money from anyplace else. So, those partnerships, whether they're there or going to other scientists in other programs and building collaborative relationships—building a relationship with Woods Hole Oceanographic, even if it didn't mean money coming in or exchanging—was really powerful because it came us the ability to move projects ahead. One of the things we did was after we had gotten the acoustics stuff to work with buoys and we were able to put out fixed buoys, so we knew if there was a whale going up the Boston Traffic Separation Scheme, we still didn't know about the rest of the Gulf of Maine. Why don't we put the same sort of capability, same sort of transducers, on a glider? One of these things that sort of navigates by itself. But we didn't have any gliders. We went to WHOI and said why don't we do a partnership here—you've got the gliders, we've got the technology for listening for whales, we've got the software for that—let's package them together. We jointly went out and they went to the Navy for money, we went to NOAA for money. Packaged together, now they have this great program. I think this year they're jointly being funded around $2 million to put out a variety of instruments of listening techniques in the Gulf of Maine to find whales and at the same time getting all this oceanographic information. They can do acoustic Doppler profiling…great success. But because of a partnership, and they start small. There's lot of people who want to partner, so it's not like there aren't people you can talk to. To build a research program, you can't just expect somebody

to just hand you a big chunk of money. It's going to take a lot of work.

RS: Well, thank you very much for your time. This has been great. I'm going to go ahead and turn this off.