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Holliday, Mark ~ Oral History Interview

Ruth Sando

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Voices from the Fisheries
166 Water Street

Interview with Mark Holliday by Ruth Sando

Summary Sheet and Transcript

Interviewee

Holliday, Mark

Interviewer

Sando, Ruth

Date

July 11, 2016

Place

NOAA Headquarters
Silver Spring, Maryland

ID Number

VFF_SS_MH_001

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Biographical Note

Dr. Mark Holliday has a B.S. in Biology from SUNY Stony Brook, a Master's in Marine and Environmental Science from Long Island University, and a Ph.D. in Marine Studies from the University of Delaware. Growing up around the water, Holiday always knew he wanted to have a career in marine science. He came to NOAA after finishing his Doctorate through the Intergovernmental Personnel Act before being hired as a fisheries statistician. He later became the Chief Financial Officer for the Office of Science and Technology. Holiday is currently retired from his position as the Director of the Office of Policy at NMFS, an office which he helped to establish in 2003.

Scope and Content Note

Interview contains discussions of: NOAA, NMFS, marine science, Sea Grant Fellowship, Magnuson Stevens Act, Cooperative Institutes, policy, stewardship, catch shares, fishery statistics, technology, science quality, social science, Vessel Monitoring System (VMS), electronic reporting, seafood inspection, Fisheries Information System (FIS), and generally leaving the agency a stronger, more prepared, and well-staffed place.

In this interview, Dr. Mark Holliday describes his experience within multiple areas of NOAA during the course of his lengthy career. One of his major contributions was helping to establish the Policy Office, which focuses on long-term projects and planning for different NOAA disciplines. He also significantly increased the NMFS budget as Chief Financial Officer, and aimed to bridge communication between headquarters and the regions, and also between the federal and state governments. He is most proud of his work in creating a national Fisheries Information System.

Holliday considers NOAA to be an excellent place for someone in the marine sciences to work and describes NOAA's dedication to helping employees continue to learn and advance in their field through education funding and targeted courses. He emphasizes the importance of science quality assurance and integrity to the agency. He also doesn't feel that there's censorship within NOAA, has witnessed that scientists work is reviewed but they have the freedom to publish their findings, most likely because NOAA administrators are most commonly scientists themselves.

Holliday thinks NOAA continues to need improvement when dealing with people and social science. Though very strong in natural science like stock assessments and oceanography, he believes the agency needs to work on understanding the impacts and consequences decisions and regulations have on people and economics. Also, he feels they should focus on improving this in the regions, where people work most closely with fishermen and communities.

Lastly, Holliday discusses how electronic reporting technology seems to be to be the future direction of technology at NOAA Fisheries and how autonomous monitoring will make it easier for fishermen to submit data to the government. This technology will allow for more detailed, accurate data and subsequently better management. He also discusses how seafood inspection is split between NOAA, the FDA (Food and Drug Administration), and the USDA (United States Department of Agriculture).

Indexed Names

Baird, Spencer

Curtis, Rita

Reagan, President Ronald

Transcript 001

Ruth Sando: Perfect, now it's recording.

Mark Holliday: Okay.

RS: I think it was on the wrong microphone thing. Okay, let me just do this quickly. This interview is being conducted as part of the 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 NMFS Office of Science and Technology. I'm Ruth Sando, and today I'm

speaking with Dr. Mark Holliday at the NOAA headquarters in Silver Spring, Maryland. We're meeting on July 11, 2016 at 2:30 pm. Dr. Holiday retired from his position as the Director of the Office of Policy at NMFS which he helped to establish in 2003. He has a B.S. in Biology from SUNY Stony Brook in Marine and Environmental Science from Long Island University, and finally a Ph.D. in Marine Studies from the University of Delaware. So, that's a B.S., and then a Master's from Long Island University.

MH: Yeah.

RS: Yeah, okay. So, you were describing your last role with NOAA Fishery as a more high-level view of objectives that need to be taken for purposes of preparing for the future, rather than operational, tactical work. Okay.

MH: That's right.

RS: When did you start in that position?

MH: Well, you said 2003 so I'll take your word for it.

RS: Okay, alright [laughter]. I must have found that online.

MH: No, that's probably right. I know it was at least 10 years, so that works out just to be about right, that I was in the Policy Office. I got into that after being on a detail from the Office of Science and Technology as the Chief Financial Officer for the organization for a year. They needed someone to step in and do that, and it was time for me to go back to my old job and I was asked if I had anything that I would like to do differently—this was by the Chief Scientist at the time. I said, well, we don't have a policy office. We used to in the organization, but we at that time did not have one. It had always interested me, and I thought it was a nice place for me to try to land at that point in my career because it was a very strategic type of role and responsibility that I thought was lacking. So, he made my wish come true in a sense and helped create that office where none had existed. Very small staff, two or three people. And again, the focus was more on these long-term missions, strategic thinking, planning, and it was able to look across the different disciplines, and so we have a lot of different tasks and a lot of different programs within Fisheries, Protected Resources, Habitat, Information Technology. They're all working in their little worlds, day-to-day operations, but who's looking at things that cross those disciplines? What are some of the efficiencies? What are some of the liabilities? How do we do better planning, succession planning for our human resources? How do we do better planning for budget? All of these things integrated into this long-term view of how do we prepare the agency for the future. That really intrigued me. At that time, I had been with the agency for 20 years, so it was time for me to look for something different and the policy role was one that I really relished.

RS: Well, you said that originally there was this kind of policy role that there hadn't been for a long time. Where did that work of kind of envisioning the future live before you started this in

2003?

MH: I mean, there was a gap where there was no given central focus for strategic planning in the organization except to feed a NOAA or Department of Commerce strategic plan, a formal strategic plan on a year-to-year basis, and that was principally a budgeting function. So, any strategic planning was done within these little silos of the different disciplines. If they had come together, they would kind of be tied by sort of weak links to try to develop a whole thought process of what are our strengths, what are our weaknesses, how do we fill those gaps. So, prior to that, about ten years before that, there had been an Office of Policy and Planning that was probably 10 or 15 people in size that developed white papers on different issues. So, that had been a prior organization, a different organizational chart filled that function, but that gradually was eroded as new leadership changed the boxes and the structure and that went away.

RS: What did working for a year on—sort of a financial officer, in that role. What did that do for you when you went into policy? Did that have any effect?

MH: It opened my eyes to a lot of NOAA DOC [Department of Commerce] process as one of the collateral duties that I held in that was formulation of the agency budget and representing the NMFS budget to NOAA, to the Department of Commerce, to OMB, and so there was a whole side of the mechanics and the processes of how budgeting and how the collaboration, I guess you'd call it, works among the different departments within the federal government. So, it was this great eye-opener, a great advantage for me—I'm not taking credit for it, but during the years that I was involved in that afterwards, I stayed on as the team leader for budget formulation in that process with NOAA, was quite successful in increasing the NMFS budget. It was probably the largest increase over five years in the history of the agency. So, we had a very strong strategic message that we were able to sell to people, and I think exposure during that time as the Chief Information Officer allowed me to meet the players and to meet the NOAA leadership and get an insight that I hadn't had.

RS: You mean the Chief Financial Officer? You said Chief Information Officer.

MH: Yeah, did I say...? Yeah, well it's the CFO.

RS: Yeah.

MH: We didn't call it that at the time, but that's the equivalent to what it was.

RS: In terms of—you mentioned increasing NMFS budget significantly. What were some of the big selling points from this strategic vision that allowed you to do that?

MH: I think there was a great deal of uncertainty in the science that had created a lack of confidence in the organization's ability to manage sustainably, and so there was a large push to improve the quality and reduce the uncertainty about our knowledge of the species that we were managing. So, that resonated quite a lot with people, it was sort of a...not necessarily a

no-brainer, but if you want us to be able to predict the impacts and to forecast what the future would look like, we need to improve the science, we need to improve the data-collection, we need to improve the process by which we do stewardship. And so this process improvement and data improvement was part of the initiative that resulted in getting people—it's a multi-stage process. You've got to convince the NOAA people that it's worthwhile, and they have to convince the department people that it's worthwhile, and up the food chain before you even get to try to present it to the Hill as a Congressional request. So, we chipped away at that and that was the strategic idea of reducing the error bars in our assessments, improving the quality of the data and the quantity of data, setting very specific performance targets—what species were we going to focus on? Why was it important to the nation as a whole? Putting it in a context of a return on an investment, sort of more of a business case. Finally, the idea of it coincided with a period of time where many of our constituents who were unhappy with our policies, not necessarily because they were bad policies, but they had affected them negatively—all of our decisions under the Magnuson Act, one of our major statutes, are judicially reviewable. So, they took to the courts to fight for the positions that they favored versus the ones that resulted from the public process, and we were losing a lot of court cases on procedural grounds. So, there was an era under the National Environmental Policy Act where many of our NEPA documents weren't up to date. We didn't have enough resources to continue to maintain them at the level of quality and the process side of things. So that was again an obvious gap in the kind of work that we were doing that needed to be fixed that resonated with making investments to provide funds for us.

RS: So, really it was sort of enhancing the foundation of a lot of the work that the agency was doing.

MH: Improving on that, I think. Yeah, and that's because of the nature of the work for the organization had changed over time. I mean, the agency and its' predecessor had been around for 100 years, and prior to our new statutory authority under the Magnuson Act in 1976, we were mostly a scientific organization. The outcome of our work was important, but it never had the consequences on people or the impacts on people from a regulatory standpoint. So, the nature of the science and how it was used changed significantly and so it was under-invested, I think, for many years and so this new regulatory role that we had required more precise data, more timely data, more accurate assessments, and different kinds of modeling then was okay during the sort of the wet foot biologist days of the organization where we were exploring new fisheries and trying out new ideas. It was just a different environment prior to this new statutory responsibility. We became from a science organization to a science-based regulatory organization.

RS: So really, along with that you would have had a lot of new stakeholders who might have had very different opinions about what you did.

MH: Oh absolutely. Yeah, there was—the role of environmental organizations and non-governmental organizations and how they interacted with the agency prior to the Magnuson Act when it was unheard of for us to have them as constituents, no less partners. I think that's how it's gradually evolved from constituents to regulated agents, organizations of fishermen to

partnering with both the industry, the fishing industry, the recreational industry, and the NGOs [non-governmental organizations] to come up with a model that works for everybody as best government can do.

RS: That's a very demanding period, it sounds like.

MH: It was a very interesting transition from—I think that was part of what I liked about the...my ability to see this happen over the course of my career. Some people are able to adapt [laughter] almost like a biological organism. Some were adapting, some were just kind of run over, some programs thrived and others withered. But the changing mission of the organization set challenges for everybody and some were able to work better in that environment than others.

RS: Was it...I mean, situations like that can become highly political when you have departments and budgets and careers that are threatened and others that are all of a sudden they're in the limelight. Did you have a lot of issues in that regard?

MH: Well, people would say that the NMFS budget was probably the most political budget they had ever seen in terms of Congressional interest. I mean, many departments that are in the six, seven hundred million dollar range maybe have three or four line items describing their whole budget, while NMFS would have hundreds of line items which represented special interests by people in a particular state. And there were some very strong, powerful Senate and House members who were on our appropriations committees that earmarked millions and millions of dollars to local programs, and if we dared to try to move money around or try to do a strategic change, we would get our hands slapped essentially. We knew better than to try to touch those appropriations and that lasted until the reform of earmarks in the last eight or ten years. That's still present, but it's not as obvious. But the idea of resistance to change and the political influence of Congress is represented in these little fiefdoms of work around the country that were favored programs on the West Coast by the West Coast delegation or East Coast, et cetera. So, it made for a challenging management issue because how could you—you may know that you needed to devolve this program or you needed to ramp up this program and you needed to move people or money around, yet you were kind of hamstrung by some of these constraints that you knew better than to try to do that.

RS: Yeah, somebody's sacred cow was always going to be sitting there [laughter].

MH: You bet, yeah.

RS: I think that's probably the same in almost any organization.

MH: I think so. I think it's not unique to NMFS, it's just that we had so many different people bidding for our interests around the country. Since we have six regions and six science centers around the country that each represent little pockets of employment, little laboratories—heaven forbid we want to close a laboratory or move people to someplace else because now that meant jobs, it's like base closings but in miniature, military base closings but in miniature.

RS: So, did you—was it striking, the difference after there was less of the earmarks, that kind of the appropriation process changed? And I think some of the people in Congress left or died, you know, or changes.

MH: Well, they restructured the different committees as well from a very visible merchant marine committee to it was kind of buried within a larger committee, and so the movers and shakers changed. There was a gradual as you say retirement of some of the big senators who were in NOAA's court. But I think in terms of its' impact, I think it lessened but it didn't go away. It just was... a lot of it went underground, so it may not have been in appropriation language but there were understandings, unwritten, unrecorded about where money was supposed to go and that continues today. As you said, it's not unique to this agency.

RS: It's a matter of degree.

MH: Yeah, I think degree is correct.

RS: In terms of working on policy, budgets, strategic planning, as you mentioned there's a lot of interests that have to be taken into account and you have to have a full understanding of how departments work together and then the outside environment. So, what areas did you work most closely with?

MH: Internally or externally or...?

RS: Well, first internally, and then outside. Who were the biggest partners that you had to consider or consult with, or who had influence?

MH: Right. So, I think one of my strengths in the policy realm was by the time I had gotten to that office, I had—this was always an issue for people, and it is today, about whether you're from headquarters or you're from the field, where's your origin in the organization, because if you're from Silver Spring many times you're thought of as you don't know anything about what life is like in the field and vice versa. So, I never had worked in the field as a field biologist or economist and come to headquarters, but I felt that because of the work that I had done and the kind of programs I did prior to being in policy, it involved every single region, every single center. So, the kinds of projects that I worked on exposed me to these people, exposed me to the different regional and science center perspectives. And so, trying to get again these regional perspectives, each of them having different priorities, each of them having different strategies to work together towards a common agency function was one of the big challenges.

One of my biggest constituencies were the deputy directors or the program leaders in these different fields and trying to get a coalition together of a common thought of how we could do things together that would gain some of the efficiencies or gain some of the best practices from one region or the other. You'd be surprised how isolated—within one organization—how isolated a region is or a center is from another one. What's going good in one region was just not

known to these other places. Serving as that bridge or communication link between them and bringing them together was one of the key strategies of can we do it through workshops, can we do it through secondments or getting people to actually spend some time in other places. A big program of trying to bring people in from the field to work in headquarters and vice versa to kind of bridge this gap, and that was a formal program, bridging the gap between different disciplines, between the protected resources perspective. Preservation under the ESA [Endangered Species Act] and the Marine Mammal Protection Act versus those in commercial fisheries and sustainable fisheries and there was this—kind of a creative tension between the two groups because they had different ideas about what their missions were, yet they were still under the same organization. So, how do you bridge that gap between this conservation-oriented versus the sustainable use, and to try to make that appear at least to function as one unit. And so, that's one of the challenges that I face of who are these major players? Were these different units within our own organization represented by these different field elements across the country?

Externally, I think the biggest group that I had to deal with were the states and my background in science and statistics was kind of a natural fit because most of our data collection involves some sort of collaboration or cooperation with state agencies and so state fish and wildlife or state natural resource agencies are involved in trying to understand the fishermen that are making a living in their state, whether they are commercial, aquaculture, recreational. So, we developed cooperative agreements with these different entities over time. The three interstate commissions, which are compacts of states together. So, working through them and again, that's where the power is in terms of legislative control. We don't lobby Congress—we're prohibited by law from lobbying—but the states aren't, and so we could work with states on our behalf to try to if there were a common goal and we could agree on what to agree on, they could be very helpful on the Congressional level as well, to help us satisfy the needs for the organization. So, I think states externally were probably the biggest constituent group that I worked with outside of NMFS. The NGOs, a particular issue, certainly they were extremely important—one of the last policies that I worked on for NOAA was our catch shares policy. So, a type of fisheries management that allocates shares of available catch.

RS: Catch yield?

MH: Catch shares.

RS: Catch shares program, okay.

MH: It was a policy that was developed in concert with a board of different constituents. It was vetted through a federal register, public comment periods with an idea of trying to adopt a new way of making allocation decisions for fisheries management. The environmental organizations, they weren't all unanimously in favor. Some were virulently against it, some were virulently for it, depending on their perspective and political leaning. So, working with them was a different group of people with different motivations and different, I guess, ways of having to deal with people than traditionally I was used to with the states and my own internal organization. So, that was again, a fascinating time for me because it was new, different, and quite challenging.

RS: That's a lot of partners, so to speak, to be working with. You mentioned when you started you had just a few people working for you.

MH: We've never had more than five, five or six people in the organization in the Policy Office. We'd have a Sea Grant Fellow, we'd have an intern, but in terms of full-time staff, three or four people. And again, it was part of the directorate, so the point was to keep it small, not to...and if we had big projects, we'd form collaborative teams and bring people in for these ad hoc purposes and focus on a very specific policy topic but utilize people from regions and centers as part of a larger approach, and I think that was the key to success in that it was less what is headquarters trying to do us, who are these pointy-headed people. You can't say that if they were there at the time, at the table, represented by somebody who worked for them in developing it.

RS: So, it was like they had partial ownership.

MH: They had to, yeah. They couldn't claim they didn't come out exactly like they wanted it, but then nobody could claim that. But they were at the table, and that was the important part.

RS: Well, you mentioned in terms of the regional offices, particularly that a couple of the tools you used were the secondments and then also workshops or other vehicles to get people together. How successful was a program like secondments in kind of cross-fertilizing regional offices?

MH: I think it had key success in some very specific individuals, particularly with respect to sort of succession planning. So, people who had been identified as potential leaders of say the Honolulu laboratory—I'm just making this up—and they needed to have some additional perspective on say, the national viewpoint. So, in that regard, I think they were very successful in allowing people to get a range of experiences outside a geographically isolated and a very specific focus. I mean, the issues—we all talk about well, fish are fish, right? But that's not necessarily true. The nature of our sustainability problems in Hawaii or in Alaska—we're still managing fish in Florida, but they're different types of allocation problems or different types of biology, even though they are still managing sustainable fisheries. So, I think that worked, but it was a very small fraction of the cadre of people who...you know, you just can't move people, wholesale move tens of dozens of people around.

I think the biggest success and influence for the field was money. Nothing talks like money does. In a prior position as head of Fishery Statistics and Economics, I was the beneficiary of some of the money that we had generated—new money for economics and social science and spreading that money around was a great way to get people's attention as well as allegiance to a common cause. So, it was like a challenge grant for people. We had a dearth of information about commercial economic data. Believe it or not, we just didn't know a lot about the people we were managing and the income and the expenses, and the costs associated with commercial fishing. We didn't have a time series of data in every region to collect that, and so I let this new pot of money kind of be the guide and say, "well, if you want to share that, great I'll give it to you if in

return you promise to dedicate it toward collecting this minimum suite of information." And so, in return for that they could get this chunk of money, they could do additional work, but they had to deliver this on a continuing basis, not just take the money one year and then run off in future years and do something different. That was typical of a lot of our programs. This was more long-term commitment of we're funding some very basic things with this new money, and so that was a very strong carrot and actually began a long time series of information—I think it still continues today—that each region receives a couple hundred thousand dollars to do this type of work that's started building a core of data that didn't exist before. It came out of headquarters, we didn't keep the money, we pushed it out to the field but there were strings attached and those strings were our way of exerting some influence on how the money was used on an agency-wide consistent pattern.

RS: Well, let me turn to your own career. What inspired you to work in the area of marine science?

MH: I guess it sounds like a cliché, but I grew up on the water...[Laughter] And I always loved fishing and sailing and boating. I always knew I wanted to be in marine science growing up, and so from my undergraduate days forward, I wound up doing something that I wanted to do from an early age. I had boats and stuff as a kid in grade school, so I always wanted to be around the water. So, that was a big environmental influence on me.

RS: So, did you come to NOAA after you finished your doctorate?

MH: I came to NOAA like weeks after defending my dissertation. I defended in December, and I started on January 18th—Ronald Reagan's inauguration day. And I wasn't even a federal employee, I was on an Intergovernmental Personnel Act. So, I was a university employee—the university was kind enough to create a job for me on paper. I'll never forget the Executive Director at the university said, "if you ever come back looking for this job I'll shoot you [laughter]." But he created this paper job for me so I could come to the government in D.C. and start work and the federal government would reimburse the university for my salary.

RS: Was that something where it was like a year position?

MH: It was a temporary. It was temporary, it had a maximum of four years. And it works both ways, a federal person can go work in the state or different agencies, local level. I worked as an—IPA was the acronym...Intergovernmental Personnel Act. I worked there for three years before a permanent job in the federal government came open and I competed for it and I was lucky enough to get in.

RS: You came in when they were doing all those rifts and budget cuts, so that was a tough period.

MH: It was worse than that. I mean, Reagan's agenda was to eliminate three quarters of the Department of Commerce, including most of NOAA. So, his personal agenda was big

government and get rid of NOAA in particular, and the Department of Commerce was not his favorite department. So yeah, there were a lot of struggles to exist at that time. The budget was something on the order of 50%—his first budget for NMFS 50% cut and then Congress at that time was able to override that but he was not a friend of NMFS.

RS: Huh, I hadn't realized he had that specific an agenda.

MH: Well, whoever on his staff did convinced him to go along with it.

RS: So, you were lucky to get that position after three years.

MH: I was. That's what I said, I felt very fortunate to be able to get in the door.

RS: So, what was your first job after the IPA?

MH: Well, it was the same, doing the same function as I had done under the IPA. I was working in Fishery Statistics as a fisheries statistician. Never trained for it, but I was qualified for it and lo and behold, within three or four years I'd worked my way up through the ranks and I became the Division Chief of Fisheries Statistics. With my background, I had taken statistics courses, but it wasn't my first love. Truth be told, with fisheries statistics, there's very little statistics involved. It's mostly accounting and program management rather than detailed—well, I shouldn't say that, there's a lot of statistics involved. I don't want to denigrate the discipline at all.

RS: Was it mostly economists working in that area at the time?

MH: None. There were no economists. The same of the division was Fishery Statistics. The economic issue was something that I has a personal interest in and eventually I was able to grow the program and we changed the name to Fisheries Statistics and Economics as the size of the program grew. So, there were statistical assistants, mostly clerks and a couple of—they call them fishery reporting specialists. They were sort of not degreed, but technical number crunchers.

RS: So, it was mainly data collection, data manipulation. Okay.

MH: Yeah...yeah. There was an information technology component to it, so there were—probably half of the people were involved in running really ancient computers. I mean, I come out of college and so we knew at least what personal computers were, but when I came to the government they were looking at the IBM cards and key punching things still. I was like, whoa, this is a couple of steps backwards before I got used to it, it was kind of...weird, to say the least. The technology gap was pretty big at the start, but eventually we caught up with the rest of the world and became a really high-class IT shop, relational databases, distributed databases and so we were able to grow into a really professional, competent group and make that transition.

RS: So, how would you attribute the success in catching up in terms of the technology? How did that happen? That's a big gap you're talking about.

MH: Well, part of it was successional, so when I first came into my position as an IPA, I must have gone to, I don't know, eight or ten retirement luncheons in the first year. So, there was a generational shift. A lot of people who had been with that organization grew up—and they had like adding machines on their desks and these statistical typewriters to do layout of tables. So, that generation kind of was moving out and the people that I was able to work with and recruit, like myself—I was the youngest person in the division when I started, so the average age was 55 or 60 and I was 20-something. Over time, I think just the nature of the people that were being recruited were looking to get and use technology as one of the tools I suppose, to something that was frightening to them. Some of the older generation of people I worked with, we had to take special care to help them make that transition and to understand what a spreadsheet was and how it could help them do their job more efficiently. So, the challenge was for those people who needed the help, to hold their hand and make that transition, but the other was to try to recruit some really hotshot young people who were coming out of college—they knew what the internet was or the World Wide Web. I think that helped tremendously to spark interest and get people thinking about how to do IT differently. We were able to shift gears and I think that was what was largely responsible for our success, were the people involved, some key people.

RS: What's your impression over time, since you came in the very early '80s and you just retired a couple years ago, about NOAA's ability to attract young talent and people's interest working for the government, and then specifically working here? How would you contrast during that period of time—any changes?

MH: I think NOAA's really fortunate. I mean, NOAA has a sexy mission. I think it's a very highly-regarded place for somebody in the marine sciences and one of the few places, to be honest with you, if you're coming out of school, where are you going to work? Fish and Wildlife Service, EPA [Environmental Protection Agency], maybe, but if you're interested in marine science, NMFS and NOAA are pretty much the federal place to be. I think we have a fairly high level of credibility. So, people want to work for NOAA.

You mentioned earlier about the NOAA Sea Grant Fellow program. I wasn't a Fellow, but I had a Fellow just about every year and they were a great resource. Some of the people I had as Fellows turned out to be today's leaders. The head of...the Director of Sustainable Fisheries was a Sea Grant fellow back in the '80s. And so, I think there's a lot of interest in NOAA and I think the talent pool is really there. People have two really career paths—they want to stay academic and stay in school and teach or do pure research, and that'll attract people and some of the best and brightest are not going to go into federal service. And so some of that really cutting-edge research that we can't do in an applied world like NOAA, we rely on our partners in academia to do that and we have cooperative arrangements to try to tap into that. Bring them in and send our scientists back and forth to try to nurse that relationship. But for those who are interested in public service and interested in the marine field, there's few places better than NOAA to work. It's an exciting place, it's got a great mission. I think the talent pool, with some rare exceptions, is there. There's been studies about the dearth of social scientists and other specific disciplines that are sometimes under-represented or hard to attract, but I think that's just a matter of

applying the right effort to make it happen. You can compete with just about any place unless they want to be in academia. I had some of the first economists I hired were top-notch and I was able to bring them in, but it turned out they didn't want to stay and do more publishing and more of that pure research. They left the government, they didn't leave to go someplace else in the federal service or state service—they went back to a university for a professorship and tenure track.

RS: Well, you know, thinking about NOAA's role in supporting sciences and marine science and developing new studies, focusing emphasis on studies, what's the history of that? At what point did NOAA or NMFS really get involved as a sort of generator of science direction?

MH: I mean, it predated me but there's always been an advanced studies program for people who are current employees who want to continue their advancement in their field. So, if you have a bachelor's degree and you want to continue on for a graduate degree or you don't have any degree and you wanted to go for a degree, there's a formal program that's been around for many, many years.

There are also just informal programs that I think NOAA's been very strong in these individual development programs, which is a form of human resource management that focuses on a particular individual's goals and objective and then puts together a training of formal courses and other things that, again, to strengthen that workforce to keep them entrained because it's—the worst things that happens is when you're lose employees in the federal government, it takes so bloody long to replace them and the process is abysmal. I mean, the federal hiring process is kind of the worst in the world. So, you don't want to lose people, so you do just about anything. If you have a good person, you want to do things to keep them. Providing training and providing opportunities, respites to go and do—even if it's three months, to go someplace and get recharged. Those are really critical things.

In terms of formal programs, I mean NMFS developed these two science programs, one for stock assessment and one for economics that are post-docs that allow people to...it's a competitive program that people apply for but again, it provides two or three years' worth of funding for people to continue and again, hopefully at the end of that process, we entrain them to come and be employees, permanent federal employees. But it's again, a way to focus on these two areas where we felt there was a dearth of qualified candidates. Stock assessment there is a lot of competition for highly-qualified people because states want them and the feds want them. It's not a big program—there aren't that many schools nationwide that produce them or fisheries economists, the same sort of thing. There's two or three top schools and really good people have a competitive choice of where they want to work. So, by developing these programs, you want to try to attract them to the NOAA experience, have their research paid for a few years, and then try to entrain them as—now that you've seen what NOAA's like, come work for us. So, that's another technique that we've tried to use.

RS: Another side of that though, is supporting the—having post-docs do research is one side of that—but also supporting science through however you do it, grants or supporting people writing articles. Can you talk a little bit about NOAA's role in pushing the development of science,

marine science, in areas that it feels like it's necessary?

MH: So, I probably don't know the right fraction or percentage these days, but at one point we used to keep—I'm sure they still keep track of it—the amount of dollars that come in and the amount that go out the door in grants for science is huge. Over 50% of the dollars that come in that are attributable as science actually don't stay in the agency, but go to universities, go to Cooperative Institutes, or through competitive programs to the industry, cooperative research programs, industry grants. So, I think there is a large component of NOAA's investment portfolio that is designed to generate expertise and access to knowledge that's not going to be within that NOAA family, and so small business innovative research grants, SBIR [Small Business Innovation Research] programs targeting typical fishing industry innovations and trying to bring them to bear for the entire industry to basic research grants, sort of like National Science Foundation competitive grant programs in particular disciplines. And so each of the organizations within—I can speak mostly for fisheries, obviously—within the aquaculture program, there's an aquaculture grants program. Within sustainable fisheries, there are fishery management ones. Within protected resources, there's a different grant program that goes to communities and habitat-based community restoration grants. So, there's a lot of investment that goes externally, which surprised me when I first heard of what a large percentage it is. I think that's good, I mean, it really again takes advantage of that partnership relationship that we can't get... again, 2,800 people, something like that. There's a limit to how much capacity we have internally, so I think we have to rely a lot on these centers of excellence that are around the country that have—we don't have a monopoly on the good ideas or the good science.

RS: Well, it sounds like there's a lot of stimulation that's able to be pushed out through all that grant money.

MH: There is, and I think the other element that helps ensure sort of the science quality, science integrity that's very important to NOAA and something that I experienced and worked on during my tenure was science quality assurance. The peer review process, the use of the national academies for conducting external reviews of our programs so it's not just us looking at our own science and saying it's the right science or are we doing the science right. It's both of those questions, but asked of others to look at us and to help guide us, and so part of my work at the policy level as well as a program manager within a program was making sure that we had an appropriate means to check our performance and the science. It could be the science quality assurance policy, formal policy stating what constitutes a peer review, what sorts of work has to be reviewed and approved before it becomes public as quality work. I spoke of publishing in external journals, that's encouraged but the checks and balances on the quality of the science that goes into it—this is all spelled out in different directives that have been developed over time. And the notion of third party review.

Again the stock assessment review process, there's a center of independent experts that's constituted through the Office of Science and Technology that are people who don't receive any benefit from NOAA funding, so they're impartial, they have no stake in the game. Many of them are international, so they're brought in to look at the particular science endeavors and partially

it's like a three person panel and review projects and review assessments and review the work that's done. So, I think that science integrity is an important element because the key to most of our success lies at the quality and the accuracy of the science that we do, and that's been I guess part of the challenge throughout my career, has been this idea of science and management. So, when we were just a science organization there was never any concern that our science might be influenced by a policy directive or political process or management policy, right. This independence of science versus management had never been an issue prior to becoming this intensive regulatory agency.

When I first came into the agency, they were in the throes of trying to figure out how to maintain this independence, both organizationally—how the different chains reported up to science, reported separately, and the fisheries management reported to separate assistant directors—to financial separation, so the money going for science was not dependent on policy decisions for management over here. I think maintaining that integrity even down to the program level. For example, observers—placing federal employees onboard fishing vessels to observe activities onboard that vessel. It's a very important scientific endeavor because you can only see certain activities at sea, not when they're at the dock. You're throwing back fish, what are the identification? You need to know when they throw them back. Is that a science responsibility, or is that an enforcement management issue? Well, if that person reports to you an illegal activity, is he or she going to get cited? And so, there's this tension between science versus management. It's important to know accurately what got thrown back, but is somebody going to self-incriminate themselves in the logbook and say, "well, I threw back these species when there's a rule that says no discards?" How do you reconcile those two challenges at an organization where you have people whose job it is to enforce rules - we have fish enforcement officers who carry badges and carry firearms and are tried as policemen who are to enforce the law? And you have scientists who say, no, we need that data to tell us the real world as opposed to what the fantasy world is of no illegal behavior. So, that's been a challenge throughout our organization and again, they've tried different ways organizationally, structurally, and policy-wise to try to keep that in the forefront because I've always—and I've witnessed it—people always say if you don't like the decision, challenge the science. So, the first thing that we'll get challenged on is that the data were biased or inaccurate or et cetera, et cetera, et cetera...or we didn't report to you the right data, the fishermen claiming that your assessment is based on false data. You reported it to us—yeah, well, we lied. Okay [laughter]. So, it's really a challenge in terms of maintaining the integrity of the science from that very start of the process of collecting it to the very tail end of peer review and review and outside assessment of our programs.

RS: It sounds like it's a struggle that probably will never have any resolution.

MH: Yeah, I don't think. It's a constant battle, and I think probably when we think we have a good handle on it, some nuance will come up and we'll have to plug another hole or come up with a better idea. Not we, whoever's working there now. I don't have to worry about it now.

RS: [Laughter] They'll bring you back as a senior consultant to tell them what to do. You

mentioned the word international and that made me think about another question, which is what is the extent to which policy considerations have any kind of international input that's either sought out or in some cases I would imagine it would be necessary? How does that play out?

MH: So, in our organization they were separate and distinct. The Office of International Affairs and I think you mentioned you will be interviewing one of the past directors. They're totally responsible for the international negotiations and international representations, and most of those are at a level above NMFS—most of the negotiations happen either through a trade representative or a NOAA level or departmental level person. So, the Policy Office that I worked in had very little to do with those international agreements or certainly nothing to do with any of the treaties that were negotiated. That was all through the Office of International Affairs. The science involved in the international arena, I mean, they depend—a large part of our science within the organization does support bilateral and multilateral commissions and organizations, whether they're tuna management or high seas management or [inaudible] management. So, a lot of our science supports those activities and in fact, a lot of our enforcement capability goes towards policing and monitoring high seas and international fisheries agreements as well, both within the agency and cooperation with Customs and Border Protection and others involved in trade products coming into the US, is how that's principally enforced.

RS: Well, I was wondering in terms of policy, is there an effort to sort of look globally for models of success in resolving issues or a new model of a way to do things?

MH: Oh sure. Yeah. And I think I mentioned earlier one of the models for fisheries management in terms of catch shares didn't originate here in the United States. The model was basically coming out of New Zealand and Australia where it was first implemented, and we tried it on for size here and over time tried to establish it as a larger tool in our portfolio of methods. So yeah, I think the idea of both from an operational management side of things as well as from a science perspective, there's hundreds of international scientific organizations that NMFS participates in. Some of the world's best scientists in the field are NOAA scientists, and so they're actually leaders in the areas of stock assessment and modeling and forecasting and climate, and so participating in these international forums, they're representing our best science and are listening to the best science from Europe and the EU and other parts of the world, and we benefit from that greatly in our own scientific endeavors. Even to the extent where part of the grant programs, part of the recipients are not just domestic partners, but some of these international organizations as well.

So, I think your question's a good one, and I think there's a lot of interaction on the lessons to be learned that the United States is considered one of the most successful—our fisheries are considered one of the most successfully managed set of fisheries in the world, and we have a lot of laurels and kudos for the work, but there's still a lot we learn about every day from organizations from other countries and other scientists that we could put to good use, and we do. There's a lot of collaboration and cooperation in these bilateral partnerships that go on where we again, exchange scientists, we exchange through these international symposium and workshop, presenting papers and exposing each other to the science that's going on outside our own little

world here in the U.S.

RS: Let me ask you about some of the challenges of working in science in the government. Do you feel like there are areas where it's made it more difficult?

MH: You know, I think that NOAA and NMFS in particular have been very... During my career, I've read a lot about censorship of science in other organizations—censorship from the standpoint of this is an outcome we want, give us the science that supports that outcome. Sort of the reverse engineering of it—the policy is determined and then the science follows that. People have accused NOAA and NMFS of doing that from outside the organization, and I've really not witnessed that. There've been some pretty controversial cases that have arisen about the climate world in particular at the NOAA level, about climate scientists and their ability to publish freely and have their work... almost without exception, I think NOAA has not had the difficulties that other—talking to friends or colleagues that work, I don't want to name names, but places like EPA and other places—where the science seems to be scrutinized in a different way. Even at Fish and Wildlife Service and the Department of Interior. I think there's really a lot of freedom in NOAA and NMFS. I mean, there's review of what gets published, clearly, and our publication process, but it's certainly not—the policy ends are not contrived out of science that's been controlled or leaned on by management, and I think that's a great credit to NOAA and I think if you ask why it's that way in NOAA and not elsewhere, I think leadership of NOAA has largely been scientists. If you look at the NOAA administrators over the years, practicing active scientists compared to bureaucrats. I don't mean that pejoratively, but as opposed to again, attorneys or people who are not from the scientific world. I think that has a large measure of an affinity and a sympathy for what science should be and how should the scientific process should work.

RS: That's an interesting point—how crucial it is that science be at the top.

MH: Well, if you want people to buy into your outcomes, you have to have some credibility, right. If the science really is at all subject to that kind of bias, you're not going to last long. I think that's the... if there's one piece of advice to people about integrity and scientific integrity, you can't be compromised and still stay in an organization that does that. You've got to move on. I've never been able to detect that kind of behavior in NOAA, and particularly in fisheries. It's not—it's a challenge because there's so many people competing for a particular outcome and we make some pretty unpopular decisions and people say, "well, if everybody's mad at you you've done a good job." I think that's a terrible cliché. If everybody's mad at you, you haven't done a good job at all. You should be getting to a better place, and I think you need to work harder to find solutions that accommodate different people's ideas and notions about fairness and about allocation and about outcomes, and science can help you make those choices. It's just they you're not taking advantage of everything that's in front of you as a scientist if you're saying, well, these two groups are equally annoyed at us. That's—to me, there's a better solution out there than that.

RS: [Laughter] Than having everybody mad at you?

MH: Yeah. I mean, when you think about it, we must be doing okay because both sides are mad at us...no! Both sides should be at least neutral or happy, right, not mad.

RS: Somebody should be happy.

MH: Well, yeah. You can't please everybody all the time, true.

RS: You know, that brings up the issue to me—in an organization that has that regulatory function, how has NOAA been able to communicate and to get buy in, and the challenge of making people feel like they have some voice in all of this, or that their real situation is at least understood? How has that challenge been addressed over time?

MH: I think it's an area that needs continue—needs work and continues to need work, and the reason I say that is you've entered the realm of people and social science, and I think NMFS and NOAA, their strengths are in the natural sciences. So, their ability to understand and relate to the constituents and the affected public, I think, is limited by sort of their disciplinary blinders. This is a topic that's of interest to me, that's always been, is the role of social science in this organization. Because when you come down to it, sustainable fisheries, sustainability, is about allocation of scarce resources among competing uses, and gee, that sounds like Economics 101, yet we pay very little attention to some of those basic premises of social science and the importance of fisheries to communities and small businesses and aboriginal or customary uses. We're all about the stock assessments and we're all about the natural science of oceanography and understanding the fish, and very much less about the impacts and the consequences. So, when you ask how are we doing about conveying to people the consequences of these actions and explaining to them and including them in the process, I think we do probably at best a fair job.

There's so much more that could be done, and it starts at the top from a policy standpoint at what our goals are, lacking any social science goals as part of our strategy, to the bottom line of how do we deal with an irate fisherman on the end of the line who's got 20 different regulations that conflict with each other and he doesn't know if he can go fishing today or not because there's too many confusing rules. How do you speak in plain English to somebody, not in federal register-ese? How do you provide an outlet for them to participate in our process when it's devised around regional councils who meet in hotel rooms in landlocked cities hours away from the port and this person is not a lawyer and is not comfortable in front of people and doesn't own a tie? Yet the customary process required all of those things to be a "player" in that council process. So, there's a sensitivity to, or lack of a sufficient sensitivity to the people aspect of management that I think could be improved on throughout the organization from the top to the bottom and part of that is, part of the problem is a literacy problem. The leadership is not terribly literate about the social sciences and what it can and should be doing for the organization.

RS: I see you mean, yeah.

MH: Because they're trained in these other disciplines. Look at the list of—I used to go down outside the director's office of National Marine Fisheries, there's pictures of every assistant administrator back to Spencer Baird from 1854 or whatever. They're all biologists or lawyers. There's a couple of women, but that doesn't mean they're any better at social science than anybody else, it just means that their biological training was harder for them to get. So, it just represents a part of our culture, a part of our training, a part of our system is biased toward the natural sciences. I'm not saying that's good or bad, I'm just saying I think there's a vulnerability there that as an organization we're missing that personal, that person element in our strategy and in our operations of carrying out that strategy, that social scientists, economists, anthropologists, political scientists could contribute to in a much larger way than they do. It's not just NMFS, I think it's NOAA as well. It applies to how people react to weather forecasts and when they told them to take cover and warnings. Well, how do people perceive that type of information and how do they act on it? If it's only in English and they don't happen to speak English, well, maybe that's a different sensitivity. Or they're not literate to get on the internet and listen to their fancy expensive radios because they can't afford NOAA weather radios. So, the gamut is one of—I'm getting on a soapbox and I'll get off of it, but I mean the social sciences I think really continue to be underrepresented in the workings of NOAA.

RS: Do you believe that that gap or absence is felt both in the regional offices as well as at headquarters, or is it felt differently?

MH: It's probably worse in the regions than it is in headquarters.

RS: That's what I was guessing, because they're right there, kind of facing that audience.

MH: Yeah. And I think they would offer that they don't have time to—I shouldn't speak for them. I don't know what they would say [laughter]. But I think it's even fewer people, fewer resources, and fewer hours available to focus on that even though they're on the front lines. And they do—I think there's been a great improvement. Not that there's... a four is better than a two, that's an improvement, but if you're looking for 100, there's still a lot of ways to go. But there's been an improvement in communications to our constituents and our stakeholders and all the other labels we give people that we affect through our management. But I think we're far from being close to where it should be, and I think the regions because they're on the front line with the fishermen day in, day out, that's where the largest share of the effort needs to be. Yet I've seen efforts that are doing just the opposite—programs that we used to have port agents, federal employees who would live and work in the ports collecting data.

RS: They were called port...?

MH: Port, as in the Port of New York, or—

RS: Port agents, is that what you said?

MH: Yeah. So, their job would be to be there collecting information about the fishery that was

going on, and they were a local point of contact and they lived in the community, they were a member of the community and they were sort of the eyes and ears of the—sort of like local policing, you know. So, that part of the agency's contracted over the years, not expanded. There's less and less visibility. The only visible people they probably see are the police, the fish enforcement officers nowadays.

Cooperative research, research in concert, cooperation with the industry on a commercial fishing vessel. You think that would be a huge part of our budget, out of a \$800 million budget... what's 10% of that... it's a very small percentage of the work that we do. Again, if they're working with you, conducting the science side-by-side with a scientist on their boat, there's much more likelihood that the eventual regulation will be meaningful to that person, rather than how can they avoid it or how can they get around it. Or if we devise regulations that are unenforceable—there's just no way that someone can follow these rules because there's no feedback mechanism about well, did we show it to these people and give them an opportunity to come up with a different way of achieving the same outcome without these Byzantine restrictions on their behavior? I go to all these meetings with fisherman, still. One activity that I still participate in that I interact with the industry, and it continues to amaze me that you guys have no clue what it's like to be out on a fishing boat—"you guys" representing scientists or fill in the blank. So, I think there's a lot of work to be done still.

RS: Do you believe that the development of new technologies, new methods of communication and everything, has resulted in a pullback of the physical presence of people? Has that been a component?

MH: I mean, that's the direct reason for the pullback of the people, but my counter would be, well, I think there's other reasons for leaving them there besides completing the data, right? I think that being the liaison and call them different things—

RS: But it gives them the opportunity to say, oh, well maybe we don't need somebody out there, right?

MH: Right. It's like oh, we can replace them with a computer. You're complaints with somebody—they've been on the phone for three or four hours trying to get their permit issued so they can go fishing and they're talking long-distance to some guy in Gloucester from Cape May, New Jersey, whereas they used to be able to go to somebody at Cape May and they would help them run the tripwires to get their problem resolved. Maybe it's like customer service, maybe it's the model or the oversimplification is more oriented towards the customer than the—the fish are not the customer, it's the fishermen or the community or the protected resource person, or the fellow who's trying to get a permit to put a dock in his backyard or something, I don't know.

RS: Well, you actually have covered a lot of my questions because you've been so thorough [laughter]. That brings up the impact of changes in technology and how they have—the classic thing is the intended outcome and then there's the unintended consequences, you know. What are—thinking back over your career, what are the striking changes in methodology or analysis,

or adoption of technology that you feel had a big impact here? I mean some people talk about big data, things like that.

MH: I'm trying to think whether to answer it from sort of an internal view of affecting NMFS or affecting the industry. One of the unfinished pieces of business that I was working on just before retirement was electronic reporting which is the adoption of technology to make it easier to comply with submitting data to the government.

RS: Is that electronic monitoring and recording, or is that different?

MH: Well, electronic monitoring is more autonomous, so that's like a black box. We, at least in the agency, we talked about electronic monitoring as putting a vessel monitoring device on your boat that sends a signal back where you were located, and that's been around—VMS, is the acronym for it, Vessel Monitoring System—that's been around for dozens of years. The electronic reporting is more some sort of device on a handheld phone or computer, something that allows you to record data at sea about what you're fishing, how you're fishing. It could be linked to transducers on your nets that talk about the depth and the water temperature when you were taking the catch, and it will provide records of that information both to the fishermen and to the agency about the biology of the fish and the enforcement of the regulations all at the same time, versus paper logbooks or recording things after the trip, or making any requirement on the part of the fishermen to record these things that are interfering with his or her behavior. And it extends to things like cameras onboard vessels to record the catch in the tote or in the net they threw. A camera that doesn't have to be manipulated by anybody, it's just electronic observations. I think that's the real big push that has yet to occur to improve the science and to improve both the quantity and the quality of the data that goes into our work.

RS: So, the technology is there but it hasn't been adopted, or it's being adopted?

MH: Hasn't yet to be adopted.

RS: Has yet to be adopted.

MH: I spent the last two or three years trying to develop—working to develop an agency policy on it, a national symposium on it, a grants program, doing all sorts of pilots, and it's still...it's still not implemented. We had developed a requirement that by the end of 2012, '13, '14, something like that, that a certain percentage of our fisheries had to have moved in this direction. We had gotten funding for it from Congress, and it just seems to be a very slow process. The whole point of this is not to say, "oh, they didn't listen to my advice or anything", it's not that at all. I think in terms of a revolutionary change in how science is conducted, that is the investment that we need to make because if you think about every individual fisherman as a research platform, there's thousands of research—we have six research vessels that we tow nets around and do things, but if we have six thousand of these vessels collecting all sorts of oceanographic data and fisheries data at the same time, I mean that's a quantum increase in the amount of information if you design it right.

RS: So, you would be collecting, a lot of it would be new data that wasn't collected before? Okay.

MH: Yeah, you can design these things to, again, be an integrated wheelhouse of information that's not just what the fishermen caught, which is what our—what did you catch, pounds and species, and how much did you get paid? That's the basic data we get from people. To on a tow by tow basis, over a ten day trip a lot of things happen, rather than the outcome at the end of ten days is 2,000 pounds and \$300. During a trip, every two hours they pull back the net and something has happened. That net was towed at a certain place in space and time at a certain depth and the water temperature was such and such, and the salinity was such and such. So with sensors and the technology that's available, you can capture a lot of this information that reveals fish behavior and fish distribution and how the fish are vulnerable, how vulnerable fish are to catching...

RS: Well, you'd also have the data real time, as well.

MH: Well, and it's all preprocessed, right. It's there before the vessel even returns to the dock, and some fisheries are managed on a very razor-thin quota and there's very little fish around so people have very little opportunity to plan to go fishing or not to go fishing, so this real-time information allows them better business decision-making. Or if they're fishing and they're seeing this by-catch, they've used this as a prototype. A certain pattern emerges, somebody's looking at these data points in real time and saying, "ah, the associated unwanted catch of this undesirable species is very high in this local over here", and they put out a bulletin to the fleet, "you've got to stop fishing in these locals and move someplace else". So, it keeps the fishery open and keeps the prohibited catch from being exceeded, that level from being exceeded, so it's like real-time management, not just real-time monitoring.

RS: So, you would have to have somebody paying attention to this in real-time, as well.

MH: Exactly, right. And not just an enforcement person looking to see if they crossed the line and they're in a bad guy situation. It's what are we learning, what can we see about the distribution and what's happening in that fishery. To me, I think that's the technology that's yet to be adopted. The other science advancements...I'm having a hard time getting off that and thinking of something that would be as salient as that would be over the last 30 years. I mean, there have been progress and things, but I don't think it has as much potential as this does.

RS: Is that being used elsewhere in the world?

MH: Yeah. It's not universally used, but there are a lot of success stories and part of our work was sending fishermen to British Columbia and seeing how it worked there, had cameras onboard vessels to see how—to talk with fishermen who had experienced it and we brought them to workshops to have them, sort of that point-of-view exchange of what was it like? Did it change the way you had to fish? Was it an improvement? What were the good points, what were

the bad points? So yeah, it's not universally used but there are a number of success stories. I think the big crux will be if there's enough of a demand for it, the pricing will go down as well. I think part of the entry point now is if it's in ones and twos, the cost per unit is fairly high. If you get a fleet of people doing it, it'll just kind of steamroll and be more accessible.

RS: Like any technology.

MH: As technology is apt to do, right. I haven't bought my Apple Watch yet because the prices haven't come down yet [laughter], but that first one is pretty darn expensive.

RS: There are some people out there helping to lower the price by buying right now [laughter]. Oh man. Let me make sure I've got—I'm getting all my questions in here--

MH: Bases covered?

RS: --Yes. When you came in, you really started your career here. Did you think at that time you would spend your whole career here?

MH: That wasn't the plan. I had always wanted to work—I mean, we have some gorgeous locations. Silver Spring is not one of them [laughter]. It got to the point where I had a choice at one point in my career, I had a job offer to go work in the field as a deputy, and just for my personal reasons I didn't take it. But at some point, it got to the point of I'd have to be a Lab Director because the wages here in D.C. are generally higher than they are in the field. So, the equivalent GS position in the field was the Lab Director.

RS: Is there a lot of movement around?

MH: No. I think it's one of the perks of being in NMFS that you get to work in a lab in Honolulu or San Diego or Woods Hole, you're golden, you don't have to leave. If you can make a living—the biggest problem for people is the cost of living. If you're a GS9 or 11 in Falmouth or something on Cape Cod or La Jolla, California, it's pretty darn expensive to live and a lot of people have very long commutes. But if you can afford the cost of living, there's some ideal places to work. The views are spectacular [laughter].

RS: It does seem like a lot of people that I've been meeting at NOAA have been here a long time.

MH: Yeah. It's not the—as I said before, I think it's a good organization with a good mission and frankly the wages in the federal sector...I mean, if you work for a state department of natural resource, they pay peanuts. The wages in state government is very, very low compared to wages in the federal government. I think there's some, just—this is the place you want to be if you're a marine scientist.

RS: Yeah, you've got the scientific colleagues here doing interesting work. I wanted to also ask

you about the issue of sustainability. Just kind of an overview of the history of the adoption of that concept at NOAA, because I'm sure when you came in they weren't really talking about that in the way that they do today.

MH: Right.

RS: So, when did that become more of a driving concern and start to embed itself, for example, in policy considerations?

MH: Well, I guess the Magnuson Act amendment, the Sustainable Fisheries Act really brought the formal lexicon of sustainability into our everyday speech, right.

RS: It's been there a long time.

MH: Yeah, I mean it's been around...I can't do the math, but like 20 years now. I think the concept of sustainability has always been there, we just didn't call it that. I think a lot of people now use the term and they don't even realize what's involved with it, right. I don't necessarily think it's a positive thing. These are renewable resources, and if properly stewarded they'll be there for generation after generation after generation. If we don't properly steward them because we're bad managers or because of our environment and we just are letting everything else go, we're going to lose that. So, the concept of sustainability is one of wise use of what we've got. I think the sustainability bandwagon that people have jumped on is great because I think it's entrained more people and it shows up in places like seafood markets now and more popular press about buying sustainable seafood, et cetera, et cetera. But I think the principles go back in our organization way back to the predecessor agencies of NOAA and NMFS...I don't think it's good or bad. I just think it's today's buzzword, but the principles have always been there and I think they will continue to be.

RS: Yeah...yeah. That's a good point, I hadn't thought about it just in terms as a synonym for renewable resources which is a long-standing issue. The other issue I wanted to ask you about the development of work on is seafood safety. When did that become a policy issue—and by that I mean worked its way into policy considerations?

MH: I think it's always—since '81 when I first came into it—there's always been some thread of seafood safety involved in the organization. We've always had a seafood inspection—not always, but we've long had a seafood inspection program. Voluntary, the industry pays for it to come in and look at their quality processes as they move seafood product through the chain. So that goes back into the '50s, at least. We've had, in previous iterations of the organizations, we used to have consumer information people, food technologists. We used to have a food technology laboratory, a seafood laboratory—

RS: Really?

MH: —up in Gloucester, stand-alone. We still have a number of highly skilled, world-class

seafood technologists looking at, in Pascagoula and in Charleston and in Seattle, the seafood technologist area about seafood safety. So, it's not like it hasn't been there for us because it's been a—the seafood inspection program is one of the performance-based organization. They receive no federal appropriated funds, they're self-funded through these fees. They have a very low profile and not unlike FDA, they're not a regulatory—it's a voluntary program. The FDA inspection program and the USDA program, there's this division of labor between these three organizations. It's very confusing to the consumer and to Congress and to everybody else about who's responsible for the safety of U.S. seafood, particularly imported product. There's a lot of adulterated product that comes into the country from various sources, a lot of unregulated product that could be from aquaculture or from wild fisheries that is either underweight or has been treated with antibiotics. So, there are issues. Those are the current issues, I think, that are troubling people today, mostly with the imported product.

I think the countervailing trend for seafood quality today in domestic fisheries is the same as it is in this farm to table movement on the agriculture side of traceability and finding where your fish came from back down to the boat. There are a number of different industry efforts that do that, so you can tell where that fish came from and where it passed in the chain of custody from one level of processing to wholesale to retail. People want to know where their food comes from. So, I think that aspect of it is driving a lot of the interest today—not just for seafood, but for all food products. It's taken hold in the seafood industry, as well. A lot of effort going into that.

RS: How much of the seafood would one be able to trace? I mean, is that a small portion or is it widely available, the information?

MH: Traceable to what level? So, there's a federal law on country of origin labeling, so you're required by law to at least know what country the product came from, how well that's enforced is another question. Then, at the second level is how far down do you want to get to what firm and what product—was it from China? Was it from an aquaculture? Is it labeled? That's a whole other can of worms I guess [laughter] about what's natural or what's...there's this whole debate ongoing about the labeling of product and what constitutes these different labeling concerns. And again, that's not our prerogative, that's other federal agencies, but we're—we the agency, not me—are caught up in trying to keep pace with that demand, which the public wants to know. Is it antibiotic free? Is it natural? Is it wholesome? All these different labels that people are—and these standards vary widely. They're all voluntary standards, industry-wide standards. There's no federal standard for most of these things. So like for wood products, there's a Forest Products Board or something that sets the standards for what constitutes sustainable fisheries, I mean sustainable forest products. Food products that meet certain standards are generally regulated but there's very little in the way of inspection of a product that's done by FDA. I mean, they're just so...they're—well, there's two ways to look at it. They do very few inspections of food coming in for quality, but those that they do are very highly targeted, so they use sort of a data mining approach to target those shipments from certain countries from certain vendors that have a higher probability of being tainted or problematic. So, they don't need to inspect it all because they can't, and since they can't, they target their efforts on—

RS: So they feel like they know where to look?

MH: Right, I think that's their...and the big box stores that they're all involved in voluntary seafood inspection, like Costcos and Walmarts and things. They pay for the seafood inspection program to inspect their products that are coming in on their behalf. So, a lot of the product actually winds up being inspected one way or the other. Sixty percent, I think, 60-70% I think of imported product is inspected.

RS: Imported in general or that's going to the big box stores?

MH: Overall.

RS: Overall, really? That's higher than I would have thought. And so NMFS is kind of on the—they're not directly involved, but they're—

MH: Well, we're involved with the seafood inspection program is part of NMFS, it's housed in NMFS, but again it's...So, we have that group that does inspection, and then we have the seafood technologists who do the analytical chemistry to determine contaminants or investigate fraud or adulteration or toxins, they're subject to red tides or all sorts of other natural health risks in fish and fishery products, vibrios and all these other things. So, NMFS has a role—is it a triad, I guess. There's NMFS, FDA, and USDA, and so NMFS is one of three federal agencies involved in the quality and safety of seafood products in the US.

RS: It sounds like that's kind of an issue that maybe it's not growing in concern, but the publicity around it has been growing.

MH: Yeah, and it wasn't too long ago that we were trying to get rid of the seafood inspection program, trying to give it—I think we're trying to give it to the FDA, part of a restructuring activity at some point that we had to get rid of s many FTEs [full time employees] we said, oh, let's get rid of the seafood inspection program. They're not appropriated funds, so let's just, you know, count against our total or something.

RS: And for some reason that didn't happen?

MH: Well, thankfully it didn't happen because I think their mission is so parallel to what we're doing in the agency that it probably belongs best here with us.

RS: It would have been ironic if it disappeared.

MH: It was just a budget exercise at the time.

RS: I wanted to ask you, thinking back now on your career, now that you have had a little bit of distance from it.

MH: I don't think about it much at all, to tell you the truth [laughter].

RS: [Laughter] Can you describe a project or contribution that you're really proud of that you worked on at some point in your career?

MH: Sure, there's lots of them. So, one of the revolutionary ideas at the time was the creation of a National Fisheries Information System, FIS. Everything has an acronym, so pardon the references. Fisheries Information System was a report to Congress that we, my division, was responsible for developing on behalf of the agency that involved a multi-stakeholder process of trying to integrate all these little Balkanized state, federal, tribal, independent systems that didn't talk to each other.

RS: Oh yeah, different databases for example.

MH: Different databases, different sources, different coding systems, different time frames, different software. There was no concept or unanimity that we could proceed because it was just the way it's been done for a hundred years, you know. It wasn't planned this way, but there are probably fifty different entities involved so we had to come up with a plan for how to bring this all together and a model and a concept on a budget of how this would work. Congress had laid out—I had worked with the staffers on drafting this particular bill, so that was part of it. To make a long story short, because we don't have all day, the end result of all of this was after a year or more of work with again an extended group of people on a team of state and all these other partners, we had a consensus on a way forward and we had consensus on what it would take to do it, and we had a consensus on the amount of money and where the money would go on a report to Congress that was submitted, presented, and it didn't go anywhere that first year. We didn't get a dime. The second year we got a little traction and got some more attention, and like three years after the fact, there was a line item in the budget that said Fisheries Information System, and that was the start of and continues to be a source of money for integration. Do we have the full concept implemented? This was 20 years ago. Of course not, but I look back and say, you know, the seeds that I planted in that project actually took root, were able to grow, and I can look and see the consequence of work that I've done. So, I think that for me the kinds of things that I'm proud that I've been able to accomplish are those that had some longevity, some lasting action.

The reauthorization of one of the Magnuson Act—there are sections that I provided what they call “technical drafting assistance.” I wrote the sections of this bill that became law, and it's like, wow, that was pretty cool. But again, it has a lasting effect or consequence and I think really what I should have said is the project that I'm most proud of is the fact that I've been able to bring people into the agency and to see them today. That they started working for me and now where they've wound up as leaders in the organization because I think that's really the satisfying part of...Rita Curtis, I hired Rita.

RS: Yeah, I'm talking to her in a couple of days.

MH: Right, I'm just trying to think of people that you'd mentioned. So, developing people and developing programs that now people have made a career of in the organization and they're excellent, creative, dynamic, and leaders of the agency. So, those are things that make me most proud. Those are the sort of substantive things—the other stuff is just [inaudible]. I think the people part is the most important.

RS: Leaving a stronger organization that's well-staffed.

MH: Leaving it in a better place than you found it. I think I can say that was true for Fisheries Statistics and Economics—that was my first job. The policy office, I don't know what its' future is but I think it was worth the investment, that there still is a policy office up there. What they're doing, I have no idea, but I think it's a necessary component for an organization this size to have a group do that and I think that's important. I'm not unhappy with my career, but I'm glad it's over. Not glad it's over, but I'm glad I'm retired. I'm happy in my retirement.

RS: Well, it sounds like you have a lot of successes to look back on.

MH: [Laughter] A lot of good people along the way.

RS: Yeah... Well, I'm probably running out of time here, taking up most of your afternoon. Let me turn this off.