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Manderson, John ~ Oral History Interview

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Voices from the Fisheries
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Interview with John Manderson by Michael Chiarappa
Summary Sheet and Transcript

Interviewee
Manderson, John

Interviewer
Michael Chiarappa

Date
August 5, 2016

Place
Phone interview

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Use Restrictions

Biographical Note
Dr. John Manderson is a scientist with NOAA National Marine Fisheries Service. He has a degree in Field Ecology from Connecticut College, and worked on charter boats in New England and Connecticut during college. He then taught marine sciences at a New Jersey community college before getting a job with NMFS in 1996. He then got a Ph.D. from the University of Massachusetts at Amherst in Fisheries and Wildlife Conservation. He continues to work with NMFS on integrated ocean modeling.

Scope and Content Note
Interview contains discussions of: NOAA, NMFS, ecology, marine science, fisheries science, commercial fishing, recreational fishing, ocean modeling, habitats, climate change, winter flounder, Magnuson Stevens Act,

In this interview, Manderson discusses his work experience as a scientist for the National Marine Fisheries Service. His first job with NMFS was running an experimental ecology program in the Navesink Sandy Hook Bay estuary on nursery habitats for winter flounder. He emphasizes that his extensive experience around boats and fishing helped him to get the job, and his interest in how habitats are defined by the dynamics that occur in the liquid, and how aquatic habitats differ from terrestrial habitats. His work on winter flounder had to end because of climate change: spring was occurring earlier and earlier, and now when the flounder hatched the water was warm

enough that their predators had already migrated.

He also discusses the work he has done on integrated ocean observation systems that combine many metrics like temperature, salinity, and oxygen into one model. His research goal was to develop a dynamic ocean model, and this was greatly helped by advancements in ocean monitoring technology and working with the fishermen themselves. Mandersonstresses the importance of actually working with fishermen and talking to them to gain an understanding of their intuition of the ocean. He also discusses how when there was a lot of funding in the early 2000s, the research could be more academic and experimental, but now there's pressure for research to only be applied and relevant to management. Funding and climate change are currently the major drivers for research.

In the last part of the interview, Manderson discusses his belief that scientists need to take information from the fishing industry into account because there's a wealth of data that would allow them to learn about issues years earlier. He feels that the distance most scientists place between themselves and the actual fishermen is a major fault of academic culture. Also, he describes the disconnect he sees between the science centers and the regional offices, and how that negatively affects everyone involved. Finally, he describes his passion for the water and working in the field with fishermen and fishing communities.

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Transcript

Michael Chiarappa: Okay. This is Michael Chiarappa. I'm going to be conducting an interview today with NOAA National Marine Fisheries Service Scientist John Manderson. Today is August 5, 2016. This interview is part of the Voices from the Science Center project to record the history of science of various scientists who have worked for NOAA and NMFS over the years. Ok John, generally what I do in interviews like this is to start by having you talk a little bit just about your education and your entre into the field, if you could do a little bit of that.

John Manderson: Yeah, so I actually started off with an undergraduate—or pursuing a major in

English, Economics, and Philosophy at Connecticut College. And got turned on to Biology and Marine Science there late in my time, so I ended up with a Field Ecology degree from Connecticut College. And then after that, I went back to graduate school for a short period of time for a Master's degree and while I was doing that, I fished out of New England and Connecticut. For a variety of different reasons, I didn't finish that first degree. I ended up moving to New Jersey and teaching at a college, community college, teaching marine sciences there. And then eventually I got a job for Rutgers University and the National Marine Fisheries Service actually running a project for the lab director at Sandy Hook. I worked for Rutgers at the time, and the reason I got that job was I spend my entire life around boats, and I was very good at boating.

MC: Oh, I see.

JM: I was running a study of nursery habitat in the New York Harbor area and under pier areas and under [unintelligible] and measuring growth rates and densities of one fish in different habitats in the Hudson River. So, I had a very intensive background around boats.

MC: Could you give a brief chronology of when did you graduate from Connecticut College?

JM: I graduated in 1978 and I entered a Master's program at Connecticut College in 1985. It wasn't really the right place to go. There were no graduate students to speak off and it just—it wasn't the right fit at the time for that. So then after that I went—and between those two period I actually worked at the Academy of Natural Sciences in Philadelphia for a very eminent, Harvard-trained malacologist named Robert Robertson who was…he essentially when I walked into his office and he was listening to Domenico Scarlatti and he was buried in German tomes [laughter]. My job essentially was to unbury him. So, at any rate, after not getting a degree at Connecticut College I—and during the period I was at Connecticut College, I actually worked on fishing boats to make money. That was actually very important to what ended up happening with my career, sort of fortuitously.

MC: Were they commercial fishing boats?

JM: I was actually working on six-pack charter boats out of Noank, Connecticut and Niantic, Connecticut. And I did it for three years. So at any rate, there are two things that I think I have that some people don't have, and that is a tremendous amount of on-the-water experience. I also have a real appreciation for the sort of intellectual side or scholarly side of biology, and I had a lot of interaction with the fishing industry that didn't come into play until like 30 years late.

After working for Rutgers, I was hired by NMFS and we had an experimental ecology program going at Sandy Hook. All the fieldwork was in the Navesink Sandy Hook Bay estuary. I was really an experimental field ecologist at that point, and very interested in how habitat is defined by the dynamics and processes that occur in the liquid. So, instead of thinking of habitat as defined by things that look like structure on land, the terrestrial paradigm, I became very interested in how the habitat for many of these animals is defined by the dynamics and processes that happen in the liquid. So living in the liquid is different from living in a gas, so how you

have to conceive of habitat in a liquid is different from how you'd conceive of it in a gas. I was trying to do experiments in that vein.

MC: What years were you doing that work on the Navesink River and in the Sandy Hook Bay area?

JM: So, we did that work really hardcore from 1996 to 2003 or 2004. And during that same period of time, I got a Ph.D. from the University of Massachusetts at Amherst in Fisheries and Wildlife Conservation. My thesis had to do with a lot of that work that we did on the Navesink.

MC: Now at that point, between 1996, you were working for the National Marine Fisheries Service, correct?

JM: Yes. So, 1996 I was hired for the National Marine Fisheries Service. That's correct.

MC: And prior to that?

JM: Prior to that I worked for Rutgers from '92 to '96 as sort of the lead technician for two lab directors: one at Rutgers and one at the Sandy Hook lab. And then prior to that I taught at Brookdale Community College.

MC: I see, and who did you work for at Rutgers? Who were the…?

JM: Ken Able.

MC: Oh, I see. In both instances he was the director of your projects?

JM: No, he was the Director—he was the director of the Tuckerton Marine Lab and Anne Studholme was the Director of the Sandy Hook lab. But Anne Studholme decided that she wanted to get her Ph.D., so she had planned on getting her Ph.D. with Ken Able at Rutgers, and they put together a thesis project and I ran that thesis project because she was the Lab Director. She came out in the field like, a couple times but she didn't have time—she was running a laboratory.

MC: I see. So you were—

JM: I sort of ran the project on the ground and did the analysis and worked on—she and I wrote the stuff together, wrote the stuff up together.

MC: So, it sounds like between your work with the recreational fishing fleet you worked with and your later work with the Rutgers lab, it sounds like you had a lot of fieldwork experience.

JM: Yeah, yeah, yeah. So, I had a lot of field experience and in the estuary. By the time we got to working in the Navesink, I became very interested in this who idea that habitat is defined by the liquid, right. So, if it's defined by the liquid, in order to do experiments right you sort of have

to map things based on the dynamics of the liquid because the liquid moves about in time and space the way that habitats on land don't do. And this is really true of things that are cold-blooded, right. So, if you think of something as simple of temperature—and it's of course not just that—but if you think of something like temperature, I mean the temperature of the water is moving all around and those animals are tracking that because they're cold-blooded. They don't have—and that temperature determines their metabolic rate and the process rate that drives ultimately population dynamics. So, they have to track the environment in a way that warm-blooded animals who are constrained whose motions are determined by gravity don't. So, we were pursuing that in estuaries and trying to measure that at the same time that there was a great, massive leap in the way in which physical oceanographers were monitoring the ocean.

MC: I see.

JM: So, what happened was it gave birth—around that time, people started putting together integrated ocean observation systems in which you take satellites in space and radars that measure ocean optics and sea surface temperature and you take radars on the shore and they're measuring current flows and velocities over a huge expanse. So, there's a mid-Atlantic one, and that covers from Hatteras to Martha's Vineyard and they're measuring those surface properties using radars and satellites. And then you have underwater robots, right, which are measuring temperature and salinity and oxygen while they patrol the ocean. And all this stuff is being integrated into ocean models, or similar to ocean models, that allow you to visualize what the ocean is actually doing.

MC: Right. John, can I just ask you a favor, just are you near a road?

JM: Yes.

MC: Okay, I'm getting background noise. Is it possible to move slightly? I'm getting background noise from the road, and if you could just keep the phone closer to your mouth that would probably give us a clearer signal, okay?

JM: Okay.

MC: Sorry. That's good. That would be great. We want to try to keep the sound as clear as possible. Go ahead, I'm sorry to interrupt. Go ahead.

JM: Right. So, at any rate they were developing this integrated ocean observing systems and taking data and having models eat the data and nudging themselves—the models are being nudged based on the data to be more accurate, right? And if you can access them, then you can watch a moving ocean. So, then what happened was I got together with some people at Rutgers who were involved in this movement and we said alright, "well why can't we do what we did at the estuary scale and use all this new technology and build habitat models that no longer depict what's going on in the animals at the estuary scale, but let's do it at a whole regional ocean scale."

MC: Oh, I see.

JM: We did this work and it ended up being published as a featured article in the *Marine Ecology Progress* series. So, we went through that, and then we have a cooperative research program at the National Marine Fisheries Service which works for the industry and the lead of that, his name is John Hoey, said "well, these guys can use all these remote sensing data to map out habitat in motion, why don't we get them to make us a model that people can use, that are useful? So, let's offer them some money to work with the industry to try to develop a way to use dynamic models to reduce the bycatch of butterfish in the squid fishery." So, we were given money to do that. To do that, right, now that we have to make a habitat model that somebody uses, not one that's published in a peer-reviewed journal that nobody reads [laughter]. Maybe it's a good idea to work with some fishermen, some people out on the water.

So, we began to build models with the industry. We're back at where this 30 years ago working on fishing boats made my experience. What's interesting is I understand from having that experience that nothing's a better habitat ecologist that your main predator, and fishermen are great habitat ecologists in understanding how the liquid works. And so I've been able over the last five years to develop some very strong collaborations with the industry in which what we're trying to do is to take what they know—and this is occurring during a period of time when climate is causing the system to change extremely rapidly.

So, I'm working with them to try to understand what's happening with climate change and to formalize their knowledge into ecological models that we can then bring to bear in assessment science and management so that it begins to make sense based on what's actually going on in a changing ocean right now. Because what's been going on before is we've assumed that the only driver of fish populations is fishing, and the ocean changes but it changes without trends. Now what's happening with climate change is it's changing with trends and none of the population models take that into account. So, that's my job, is to bring habitat ecology to bear in population dynamics and have the assessments of fish populations and the regulations make sense in terms of a moving dynamic ocean, and doing that with the industry using a field-based approach.

MC: So, I'm familiar with this movement towards, as you're well aware, towards greater collaboration between the scientific community and the commercial fishing fleet and as you know a lot of people call that "traditional ecological knowledge." The work of—I always forget—Mr. Ames up in Maine?

JM: Yup.

MC: So, it sounds, in a sense—you're finishing your Ph.D. kind of really coincided with this sort of reunification between the scientific community and the commercial fishing fleet. Is that a fair assessment?

MC: I would say that that's true, but I would add another component to it. That is a revolution in oceanography and how we measure it. And it's the same leap that was made when landscape ecology was developed in the late '70s and early '80s. So, then what happened was you had

people beginning to use satellite information to map out the landscape on large scales in GIS [geographic information system]. What we're doing right now with the technology, with ocean modeling technology, is we're mapping the dynamics of the seascape at the scale of the system. So, if you combine field ecology with collaborative research in which you can leverage an entire fleet of boats, can crowd source it with this technology. And you sort of use—this idea of working with the industry is incredibly old. I mean, this is what Short did at the turn of the century, and Short was a massively important Danish, I think he was Danish or Norwegian, marine scientist who was involved in the birth of ICES [International Council for the Exploration of the Seas]. All those people worked with the industry to understand fisheries oceanography. Everybody in the North Sea did that. What we're able to do now is take that same old approach and apply it in the context of these new high-tech tools and digital data-sharing, sort of crowd sourcing infrastructure to monitor what's going on in real time at the ocean at the scale of the whole ecosystem. That's only possible using a traditional approach in the context of sort of high-speed computing, high-end oceanographic modeling, and network data-sharing.

MC: Yes, yes. Just to sort of get a sense again of the chronology of this. When you started working for the National Marine Fisheries Service, again, was that '96 did you say?

JM: That was '96, yes.

MC: '96, so you've been with the National Marine Fisheries Service ever since then, I take it?

JM: Yes, that's correct, yeah. From '96 to the present, yes.

MC: And that work you're doing now sounds fascinating. Was that—were you doing similar work when you first joined the Fisheries Service?

JM: No.

MC: What were you doing then?

JM: I was doing purely experimental work in the Navesink River on nursery habitats for winter flounder.

MC: Oh, this is when you worked with [unintelligible] I take it? Maybe?

JM: Yes, yes. That's correct. Absolutely correct, yup.

MC: Yeah she was…Now that estuary research, did that serve as a—how do I say it—an appropriate foundation or where you are now?

JM: Absolutely. Everything I'm doing, everybody thinks I'm doing something entirely different. I'm not doing anything entirely different. I'm doing everything exactly the same, just the scale is bigger and I'm doing it with fishing industry people because when we were doing that estuarian work, I could spend 100, 150 days on the water doing my work. I developed an intuition for the

system, right. I can't do that at the scale of the ocean. Fishermen do that, so they're my intuition—they're the intuition I've got on the estuary. Because it's scaled up, it's now become relevant to ocean management. So, the ecology becomes relevant to ocean management because the technology allows us to do it at the scale of the ecosystem. It's the same thing with landscape ecology. Land management was a different animal until the 70s came along and GIS and remote sensing allowed you to look at landscapes at large regional scales. The same things' happening right now with the ocean, but all the pieces of the puzzle are there and sort of experimental field ecology and working with fishermen and in having friends who are on the cutting edge of this revolutionary transformation in physical oceanography and ocean modeling.

MC: So, when you were working with the estuaries which are a more contained system where you could go out and do the fieldwork and of course gain the kind of intimacy with the ecology that that allowed you. Am I correct in assuming that now that you say this crowd sourcing, you can use all this data that this—how would I say it—this array of fishermen that you're dealing with, they kind of make up for the fact? Because you can't be everywhere at one time, I assume that they're sort of doing in a sense, helping you with your fieldwork, is that correct?

JM: Absolutely. They're doing the fieldwork and I go out with them, too, but I can't go out with all of them at once. And it's not just—a lot of people in sort of fisheries research talk about fishery-dependent data, right. There's a big emphasis on fishery-dependent data. Well, fishery-dependent data is one thing, fishery-dependent understanding is another thing. So, it's not just data, it's actually talking to these people about what's going on because people sit behind their desks—the problem these days is you have tremendous computing power, big data streams and you think you can sort of use data mining techniques to figure stuff out. Well, you actually can't ask the right questions in the first place unless you have a real intuition for what's going on, right. And one way to get that intuition at the scale of the ecosystem is to work with fishermen and actually talk to them, and talk to them about what they think is going on in the system and then trying together to work out modeling approaches that allow you to capture it in a formal way that you can then bring to bear in scientific assessment.

MC: Well, that's an excellent description. Would you say based on your earlier years in the field that this has been a—as we know, you were pointing out, and as a fisheries historian myself I know that these collaborations have existed since the late 19th century and that it seemed gradually through the course of the 20th century those relationships frayed a little bit and it seems like now we're back to that. Is that what you've seen during your career, this sort of rapproachment or reunification going on?

JM: I think that that's true, but it's a hard—there's tremendous distrust. Somehow you have to overcome that tremendous distrust, and the distrust is everywhere. So, what's interesting is there's a human dimension to all of this, and it's also—when I started out, I was an ecologist. Now I'm kind of an ecosystems scientist where if you're working with the industry, you have to understand not just the effects of the ocean on the distribution of the animals and the dynamics of the fleet, but you have to understand the effects of global economics on fish prices and the incentive to fish in the first place. So, it gets very complicated and it's a wicked problem. It's not a deterministic system that you can come out with one solution and that's it. It's a process of sort

of mining what's happening right now and coming up with the best solution in an environment where there's very little trust. But if you can find a few collaborators and develop very good relationships with them and they are leaders in the industry, you can go a long way. It's clear in my mind that you can lose that trust in a heartbeat.

MC: That's a fascinating…it's interesting that you're saying—I was just talking with a friend of mine, a fellow environmental historian, and we were just talking about that sort of spectrum between what the human agents do on the one hand, which is often culturally and economically driven, and on the other hand we talk about these very deterministic factors that people see the structure of nature and so forth and how so much of these things that we study are sort of influence by both of those poles.

JM: The truth is in the integration of them. Economics and ecology are not separate field, in the end. They're the same. That's the problem that we are walking into now, is that ecosystem science is all of it together and they're not independent. We're near carrying capacity for the planet and we have to figure out how to harvest resources in a way that we don't crash the planet. So, that's our job. Economics and ecology are inextricably the same thing. Human beings or animals are inextricable parts of the ecosystem.

MC: Yes. Well, you did your work on estuaries. Were you the project director of that, or were you working under someone?

JM: I was not—I worked under Al Stoner. I was kind of the idea guy, but not entirely. Al Stoner was a guy who was hired—there were a bunch of hires made in '96 that came into the Sandy Hook Lab. I was one of them, but I came as a technician. Al Stoner was hired out of Lee Stocking Island in the Bahamas to run the branch, and he was in the Behavioral Ecology branch until about 2002. And then he moved on to the West Coast, to a lab in Oregon, the Hatfield Lab. He was a great field ecologist. Very pragmatic, very practical, very productive, and an extremely good leader. He's the best leader I've seen in the entire agency. Although I can think of one who'd emerging right now who might be as good, and that's John Hare.

MC: John who? Say that again?

JM: Hare. H-a-r-e.

MC: H-a-r-e. And what was Stoner's first name?

JM: Alan.

MC: Alan Stoner, yes.

JM: He's since retired.

MC: Yeah. Linda Stehlik mentioned him as well.

JM: I'm sure she did.

MC: When you finished up the project working in the Navesink River and excuse me, the Sandy Hook Bay, what project did you move onto after that?

JM: So, I started using that ocean observing system, right. What was happening was we were able to get internet connection on a boat, which you couldn't do before. So, what I was trying to do was I would take a bunch of computers with internet access to the ocean observing system and I was trying to figure out how to sample in that moving ocean. So, we would get real-time satellite information and try to sample across dynamic gradients. So, I started doing that—I was trying to do field work in the context of a moving ocean because normally what you do is you design experiments with sort of this classic design and your stations were fixed in geographic space and you would turn to them or you would do a stratified random survey, but your strata are all fixed in space. So, what I was trying to do was to take all this oceanographic data and information and do in real time sample with respect to the moving ocean. So, I would say moving from a Eularian view, a Eularian approach to sampling to a Lagrangian approach where you're trying to stay—you're trying to stay within fixed properties of the ocean, but in order to stay within certain properties or conditions in the ocean you have to move.

MC: And that work that you were doing, was that in close collaboration with the commercial fishing industry, or was that not…?

JM: No, that was just—Linda was part of that. I was doing that as purely a scientist. I didn't really get into working with the industry until after we had published that paper, that paper in [maps?] and we were asked to make something useful for management.

MC: Oh, I see. And what—

JM: All this was totally serendipitous [laughter].

MC: Right [laughter].

JM: My whole career, I'm just darn lucky.

MC: Right. Was there a particular—you were working doing the ocean-oriented work you were doing that you just described. What years was that taking place?

JM: My guess is 2004 through 2008.

MC: Ok.

JM: What happened—so the other thing is interesting. So, in the estuary we're working on winter flounder, this is in New York. These things were like white rats, I mean, there were millions of them when we started in '96. But essentially there was nothing left by 2002. Climate change had gotten them.

MC: Oh really?

JM: So, we lost our organism, right. We lost our central organism that we were studying. We worked on that animal for eight years. I mean, I grew up fishing for them when I was a kid and Easter weekend in Barnegat Bay, used to go fishing all the time—now they're gone.

MC: Right. So—

JM: We had to change focus.

MC: And what was it about the climate change that affected the winter flounder?

JM: Well, I believe that winter flounder are—there's a name for it—but they began to mobilize their reproductive system towards spawning in the early fall. If you ever see one in spawning condition—after spawning, they look like concentration camp victims afterwards. They look terrible, and essentially they are programmed to spawn at a certain time. I believe what was happening was that they were continuing to spawn while spring was occurring earlier in the estuary. They spawn in early February and their larvae take—they're about 30 days to hatch and settle in cold water, and then they settle in pretty cold water, right. So, what was going on was spring was happening earlier and it may have been triggering the onshore migration of a bunch of predators into the system, into these shallow estuary systems. Things like sea robins down in the mid-Atlantic, maybe red hake, and those things eat winter flounder like dogs. I think that climate was triggering—the animals were settling late with regard to spring, a new timing of spring, while the offshore predators were moving in, and so there was a mismatch and there was very high mortality. That's my guess as to what was going on. You could see it in the adult population dynamics. I wrote a paper about that in one of the Canadian journals about sort of what it looked like was happening was this sort of repeated early spring warming was causing these boom and bust dynamics in the populations. It looked like what was happening was that those climate signals were aimed at early juvenile stages and nursery grounds in the mid-Atlantic.

MC: I see. And that publication was again, that was the Canadian…?

JM: That was the *Canadian Journal of Fisheries*. I think that was 2002. Really haven't had many publications.

MC: I'm curious. As a scientist during particularly your career with the National Marine Fisheries Service, I was wondering if you could describe—this is something that we historians of science in the fisheries are always interested in—what contexts, both it could be cultural, economic, or political, were kind of driving the research that you were encouraged to do? Could you talk a little bit about that?

JM: Ah, yes. I would say when we worked in the estuary—well, a lot of this is financial. So, when we were working in the estuary in early 2000s, there was a lot of money around. That

money has gone away. I mean, everyone's work now at the Northeast Fisheries Science Center had better be focused on applied work that's relevant to management now, because there just is no money left.

MC: I see.

JM: So, the other thing…and it's interesting as a scientist because you think you're objective and you aren't at all [laughter]. Essentially you're telling a narrative and you're not really sure what you're—you'd like to think you're purely objective, you're just pursuing truth, but it's actually not true.

But the whole climate thing, the climate change thing really concerns me. Watching that play out in winter flounder and then being involved in a project where we built a habitat model for this animal called cusk and worked with people at the lab in Boulder to sort of forecast what was going to happen to these populations in 2050 and 2100 and look at sort of the habitat dynamics and how those would change over time. That was a real eye-opener. So, the whole climate thing, climate-change thing—it' important to me and it's become a major driver for people in the agency. I've never, I think it's really startling and scary as an ecologist. I'm not sure we don't over-emphasize it a little bit, but it's playing now in fisheries constantly in a massive way. It's played out in a massive way in a governance system that doesn't take into account the ecology of what's going on. So, the whole thing is sort of management and regulations without ecology when things are moving around because ecology is changing is a train wreck. It's causing people—we're driving people into bankruptcy for reasons that I think are not…I mean, sustainability is one thing, but people need to eat, also. I think it's a great—so, climate change is another driver and there's money available for it despite what half of Congress seems to think, of three-quarters, I don't know. So, I would say that those two, sort of climate change and money, the money available to do different kind of research and having it go from being a more academic sort of focus to being required to be absolutely applied now because of a shortage of funds are the two things I can think of.

MC: Right. The two questions that come to mind—number one, Rich Langton brought that up, the issue of, and I think you're alluding to that, which is this reactive nature to the research rather than being more preemptive and being more pure science oriented, let's just do the research and do some forecasting for maybe the next 50 to 100 years whereas a scientific agenda being driven more by a crisis.

JM: You know, we make our own crises. One of the things I did last year was I moved to Cape May, and the reason I moved to Cape May was I wanted to know what was actually going on in the industry in real-time. I was able to get a hold—I worked out of the Port Agency's office and I was able to get a hold of software that shows you real-time where the industry's going. What they're fishing, what they're landing. Now, we don't take *any* of that information into account. That's real-time stuff that's going on. The law enforcement people take it into consideration, but no one in a science field will touch it. The reason we're reactive is we don't pay attention to what's going on. By the time we realize what happened, it's three to five years after it's happened and it becomes a firestorm. If people would just—if as an agency had just paid

attention to what was going on, we wouldn't be reactive [laughter]. It wouldn't be such a train wreck. And the data is all lying there, waiting to be picked up.

MC: So, what you're basically saying is, for instance, people go out and do trawl surveys and so forth, but what's obviously equally important is to pay attention to actually what's happening in terms of the harvesters themselves and they're not doing enough of that?

JM: Absolutely. Absolutely. What are they seeing? Are they seeing blueline tilefish on the shelf break which used to be down around Hatteras and now they're landing them up in—I mean, that's a great example—now they're landing them up in Hudson. This year it became a bug management problem. Well, if you look back at the study fleet data and the observed data, you should have known seven years ago that this was going to be a problem [laughter].

MC: Right. Yeah.

JM: I mean, now they're reacting to chub mackerel up here, and chub mackerel are hot water fish and they're starting to show up on the shelf break during the summertime. They've been harvesting them for five years but all of a sudden they're a crisis this year? I mean, come on now. Just pay attention. These guys are data collecting for you all the time, you're collecting all the data, it's stored on computers, yet you're too *pristine* and academic scientists to actually look at it? I mean, come on now. We're not academic scientists. We're public servant and we're supposed to be figuring out how the ocean works and how the ecology works so people can eat without crashing the ecosystem. That's our jobs, not to act like academics.

MC: Right, no that's interesting [laughter]. Wow, as a social scientist that seems patently obvious that you'd want to pay attention to that particular variable and the information that's coming in via the actual harvesters themselves, that that's going to obviously provide you with lots of insight, so that's…the fact that some scientists choose to sort of remove themselves form that dataset is fascinating.

JM: You know what, Mike? It's not some—it's nearly all. Nearly everyone. Everyone is trying to look at this from 50,000 feet and they're completely detached from the ecosystem and the industry because they're tasked to figure out how to manage so we don't crash the planet. It's really…it's truly an outrage when you get a handle on it because it's all there. It's all lying there waiting to be looked at. Every day. [Laughter].

MC: Now, this is an interesting issue. You could probably shed some light on this because I know that oystermen that I've worked with, because I do a lot of work in the oyster industry, they often lament the fact that scientists don't you know, interact and communicate with them enough and get their observations. I think this is an interesting issue. Why do scientists ignore or seem to display a certain obliviousness to the very data and actual process that you're talking about? Can you kind of describe that? Why that's occurring?

JM: You know, it's a culture—you're a social scientist?

MC: Yeah, a historian.

JM: [Laughter] I'm going to ask you to tell me that.

MC: Well, I know—

JM: I have no idea [laughter]. I have no idea. Because we don't know. I mean, we go out—as fisheries scientists, we have two large-scale snapshots surveys of the system where the distance between the stations is 20 kilometers so you can't resolve anything that's going on less than 40 kilometers, and you can't really resolve anything that's not happening on a…except in the spring and the fall. And yet we've refused to look at data that's being collected at a much finer scale by people continuously at other times of the year. Why would you not work with them and talk to them and look at the information? I don't understand it. It's a cultural thing having to do with academics and thinking that somehow they'd get their hands dirty by working with people in the industry. I'm not sure. It's a very, very interesting problem.

MC: I know it's an intellectual institutional issue. I mean, as an historian I do a lot of fieldwork and oral history and field observation in addition to doing the traditional document-based research that most historians do, but on the other hand, there's lot of historians who would not go out and look at the material culture or the technology or do the oral history. Again, to my mind, they're missing some really important data.

JM: Oh, absolutely.

MC: It's sort of a weird—I don't know how to describe it—a bias or a dismissal of this data. I know that a lot of times scientists will say, "oh, we can't listen to fishermen, everything's anecdotal and biased." I said, well again, you can make—

JM: Every hypothesis I ever came up with wass anecdotal [laughter]. Until I got in the field and tested it and evaluated it. Everything that we do is anecdotal, and so you just get in the field and do it. All the scientific wild-ass guesses we make are just purely anecdotal [laughter] until we test them.

MC: When you referred to the money that was available, was that just the flusher times? When the winter flounder project, was that information meant to help the recreational fishing community more or the commercial fishing community? Your earlier work.

JM: I think that—what was interesting was I don't think…it was something that we could do, it was something that Al Stoner could help us do and really have a full-on research program on a species that was commercially and recreationally important, and on a life stage that was extremely important. But it was never really targeted—it was never…the goal was never to walk into an assessment with that information. The goal was to try to do some groundbreaking science on nursery habitat using a commercially and recreationally important species as a model target species. So, it was sort of spun in a way that people say, oh the work on marine [unintelligible]. And it was a Clinton year, so you know, we were all pretty flush [laughter]. There was a lot of

money around. We didn't have a collapsing banking system. I don't know where all the money went, but I'll tell you what, it went pretty quick. [laughter].

MC: Right, yes.

JM: Hurricanes, a collapsing banking system and boom, it's over.

MC: Right.

JM: The luxury of doing academic life science disappeared early after the crash.

MC: Yes. You've worked at a number of research sites it sounds like. Sandy Hook, did you say Tuckerton as well?

JM: I worked at Tuckerton, I just spent three weeks up at Narragansett. I worked at Cape May all winter and I'm going to go back there this winter.

MC: Over the course of your career, have there been certain—I'm very interested in scientists and the locations that they work from and I know some of those reasons are probably practical—could you describe some of the differences that characterize the various research locations you've operated from?

JM: Well, I would say that Sandy Hook and Narragansett—I think frankly everyone benefits by being out of Woods Hole [laughter]. There's a certain amount of freedom working out of Woods Hole. I actually think Sandy Hook was a great place to live and work for a fairly long time for me. It ceased to be a great place to work after a little bit, probably a little bit after Sandy.

MC: Hurricane Sandy?

JM: Yeah, Hurricane Sandy. Maybe a little bit before that. But at the time, we had a lot of freedom and there was some intellectual comradery. I think I've had the same experience in Narragansett working with a few people up there. There's some really good comradery, there's some people who are intellectually interesting and stimulating —there's sort of a central mission and game people are playing. So, I've been out of an office…I've actually been out of an office, a full-on laboratory situation, currently for four or five years now in truth. At least hypothetically, until just recently. The whole time I thought Sandy Hook—when Al Stoner was there it was great. The group was great, the group dynamic was great. I was up at Narragansett for the last three or four weeks and I commented to them I haven't felt this good in an office since 2002. There's a group of people up there fired up about marine science and making a difference and it's fun being around them.

MC: It's interesting that you were saying basically being away from Woods Hole maybe gives you a little more—has given you a little more creativity in your research?

JM: I think that's true. Absolutely, yup.

MC: Yeah, that's…and in each of those locations, Cape May—

JM: Cape May was fascinating too, because Cape May there was a guy down there named Josh O'Connor and he's the port agent and he's a young guy who's an Iraq veteran and I never understood what the regional office did. I had no clue what the regional office did, GARFO [Great Atlantic Regional Fisheries Office] or NERO [Northeast Regional Office]. Not a clue.

MC: What's the regional office?

JM: The regional office, so they're the people who are in charge of finally designing the policy regulations and implementing them and policing them. There's a distinct wall between—there's a pretty hard wall it seems like between the science center in general and the regional office. But it turns out, and I didn't realize how crazy that is, because it's really crazy because then you get policy people making up regulations that don't take into account the environment, and no understanding of from the science side that there might be some relevance of their ecological work to the policy side. So, that's actually been a really interesting—that was a fascinating thing, was understanding what the regional office does, how it operates, what it does better than we do on the science side, particularly in terms of having people at the bottom, sort of the boots on the ground communicating up the chain of command and having—John Bullard, who's head of the regional office who makes the final call of things on that end—understand what's going on on the ground.

MC: So, the regional office is based where?

JM: It's in Gloucester.

MC: Oh, it's in Gloucester. So, they're in Gloucester, the policymakers, and the actual scientists are, of course, in Woods Hole.

JM: Correct.

MC: Trying to coordinate those two, I could see, as you say could be a challenge.

JM: Yeah, well there is—there has been…I mean, there really does need to be—a lot of this is about breaking down stovepipes, every stovepipe, and see what you can, how you can make groups work across lines. It makes sense.

MC: Were there certain—one of the things that we're interested in in this project is understanding, at least from a scientist's perspective, how the Magnuson Act shaped their work or influenced the projects they worked on. Does that come into play in terms of your career?

JM: Yes, absolutely. As much as I hate the term now because I think it's so poorly understood, everything I have been involved with usually explicitly has been cast under the essential fish habitat provisions. That includes me making statements sometimes, fish live in the water and

people don't seem to understand that when it comes to habitat. But Magnuson was the framework that has defined my career.

MC: Are there particular examples of how that did that that you could sort of show that correlation or maybe describe that?

JM: All the winter flounder work had to do with essential fish habitats for a commercially important stock. EFH [essential fish habitat] at a level 3, where you're looking at habitat effects on growth and mortality rates, and then finally in that paper I was talking about, that Canadian journal, trying to relate that to level 4, which is stock productivity. Everything I'm doing now is—I've focused on butterfish and on butterfish habitat and taking into account how those shifts in thermal habitat are affecting how effectively the survey measures the butterfish population. Then I've been working on squid, looking at thermal habitat dynamics and how that might be affecting winter mortality rates and population dynamics in squid, and I'm doing work on mackerel but it's all habitat stuff. It all falls under ESH - essential fish habitat provisions of the Magnuson Act.

MC: Oh, I see. I see, interesting. I can understand how that does provide this sort of large framing mechanism, if you will, for your research. Boy, these are all very interesting topics. Is there—I know you spoke quite eloquently about this work you're doing now, of course, on habitat—what have been some of the, if somebody was to say, some of the high points, things that really jump out in terms of your satisfaction as a scientist? Are there certain things that are particularly telling, particularly poignant in terms of your career?

JM: I've really enjoyed a couple things. I really like thinking about the water and how that defines habitat and I just had a paper come out in ICES journal about the frontiers of seascape ecology on the differences between landscapes and seascapes, and writing that and suffering through writing that has been an important thing. It's sort of based on my field experience, so I've liked that. I mean, I have to tell you, I *really* love working with fishermen. I really have very good relationships and some of them have become friendships that are better than friendships that I've had with colleagues actually. I think…that's actually more than papers, more than an award or two. That's actually been more important to me than anything.

That period of time I spent in Noank working in the fishing community, I really enjoyed being in a community. Those people took care of each other and they were sort of the salt of the earth. They cared a lot about families and stuff like that, and I have to admit I like working with these guys, they're really fun to think about the ocean with and how fish work in the ocean and then they're really sort of real people. They're not really stuck up, they're not worried about how many papers they've published or whether they've published in *Science.* They're not arrogant, really. They're just trying to make a living. They're a little bit easier to deal with—they're better collaborators and they're better scientists because they're willing to announce they don't really know what's going on [laughter]. Scientists don't like saying they don't know. We're supposed to go to work every day like happy when we don't know, but nobody wants to admit that they don't know. Fishermen will say, "well, it looks like this, but any time you see it and it looks like this it changes."

MC: No, that discovery issue is very important. Like you said, that's part of the allure I would imagine of the job as a scientist, is the questions, right? Not necessarily having the answer. You and I are going to have to talk more after this interview at some point, I'm going to save that for now because we have a lot in common in terms of our approach—I mean, from different disciplinary perspectives, but I'm going to stop you. I don't want that on tape right now [laughter]. But I understand what you're saying. It is interesting to, I think what you're alluding to as a scientist, which is really I think quite striking, is your work with fishermen sort of put your work in a more holistic context? Is that…?

JM: Yeah.

MC: I like that. To think about one's work in a broader context like that—not just this immediate task-driven sort of scenarios sounds interesting. I agree. It sounds interesting when you can each, from a different perspective, one who's a harvester, another who's the scientist, can sort of mull over these questions. I think that's…

JM: I figure now together, right. It turns out originally when I started, I would say that I learned maybe a little bit more from them, but now they learn from me. So, now we have this mutual…we're all learning together and we don't know. We should be tickled to death when we get up in the morning and we say we don't know something [laughter]. That's what makes us scientists, right.

MC: I know what they say in social science terms, what you're involved in is this "information exchange" which is fascinating. I know a lot of people that are involved in anthropology and sociology and so forth that information, that exchange between parities and it's sort of a shared knowledge, you know. What we call in history circles "shared authority." Sometimes when you do oral history with certain people, you're basically listening to their account and you have your perspective as an historian, but together you're really sharing your authority and your perspective, and that sounds very similar to what you're doing in terms of the living ocean and the species that you focus on and that the fishermen focus on. That's really quite intriguing. Wow, so…yeah. So, you're still at this point—again, the project you're working on now, how many more years do you think you'll be working for the Fisheries Service?

JM: My wife tells me six.

MC: Six [laughter].

JM: My wife tells me six [laughter].

MC: Wow, I mean, it's very interesting work.

JM: Yeah, it's fun. It's fun and I don't actually want to leave yet because I'm trying to push a different way of working into the mainstream maybe. I mean, I like to think that I'm trying to do that. That would be fun to do. Then I would feel successful, actually, if people were sort of

applying this approach and paying attention, trying to make the same—and sort of this ecological knowledge, whether practical or academic or some sort of amalgamation of that underlying their management and regulations of the ocean, then that would be a real success. I mean, that would be huge success. I'd be far happier than I would be about anything, really.

MC: Yes. I'm going to email you about that article that you — did you say you published in ICES?

JM: ICES, yeah.

MC: The International Commission for the Exploration of the Seas? Is that their journal?

JM: Yeah, yep.

MC: I'll do that. I'll email you. You know John, is there anything else you want to comment on? I mean, this has been really—this information is really great.

JM: I don't think so. If you want to talk again, I can do that, but I think that's most of it. If I think of something, I can email you, but that's pretty much it.

MC: Yes…yes. Well, this has been great. I'm going to say we're going to conclude the interview now and I will—what I'd like to do is I'm going to send you via email a permission form which allows this information to be used by researchers in the years to come. So, what I'll do is, if I could, I'm going to send that to you as a PDF, in PDF form, and then you can download it and sign it and then could you send that back to me as a PDF?

JM: Okay. Yeah, great. Can I sign it digitally?

MC: I guess if you could do that. Whatever way will work for you.

JM: Perfect.

MC: I'll send that off to you. I'm in southern New Jersey a lot, you know, I'm calling you actually right now from Camden County, New Jersey. I'm down here all the time. I'm here all summer because I do research in South Jersey and so I do get down to Cape May a lot, so it would be great to hook up and talk.

JM: Yeah, you should come down in the winter. So, I'm going to be there from October through May probably, this year. So, what I'm trying to do is get out of Dodge when it's hot, when my rent goes to $14,000 a month and when the scallop boats are in there because I can't—there isn't any room for me on scallops in terms of doing innovative science so I'd rather just get out of town and continue to work on squid and mackerel up north. So that's what I'm doing now. But I intend to be there, I'll be there from October 1st through May for the winter season. So definitely come down.

MC: I will do that.

JM: I'll take you to the port and we'll talk to some fishermen and talk to Josh at the NERO offices with me and yeah. You'll find it interesting. Meet some fishermen [laughter].

MC: Yeah, absolutely. I've been to [Lauterman's?] quite a bit on the water. So, yes indeed, it will be a…Well, John, thank you very much. This has been—

JM: Great time.

MC: Same here. Linda told me that I would enjoy speaking with you and she was absolutely correct. I'll get the form off to you and I'll be in touch. I want to get some of the citations from you. So again, thank you very much John and I'll be in touch.

JM: Alright, thank you.

MC: Take care. Bye-bye.

JM: Bye.