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Parrish, Frank ~ Oral History Interview

Edward Glazier

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

Interview with Frank Parrish by Edward Glazier

Summary Sheet and Transcript

Interviewee

Parrish, Frank

Interviewer

Glazier, Edward

Date

July 29, 2016

Place

Honolulu, Hawaii

ID Number

VFF_HU_FP_001

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Biographical Note

Dr. Frank Parrish was inspired to pursue marine science by his Dad and his work. He learned to SCUBA dive at age 11 while living in Puerto Rico. His family moved to Hawaii just before he began high school where he spent these years volunteering for his Dad and recreational diving. He earned his Bachelor's degree in Zoology, his Master's degree in Geography, and his Ph.D. all from the University of Hawaii. He began working at the Pacific Islands Fisheries Science Center as a biological aide, and is currently the Ecosystem Sciences Division Chief. He earns his 30-year pin from NMFS this year.

Scope and Content Note

Interview contains discussion of: Hawaiian fisheries, artificial reefs, Tripartite Symposium, divers at the Pacific Islands Fisheries Science Center, tow-boarding, emergence of ecosystem based fishery management, monk seals, cooperation between NOAA and National Geographic, use of technology in fisheries, National Environmental Policy Act, evolution of fish tagging, Hawaiian Undersea Research Laboratory, coral growth, recruiting young scientists, future of marine science, impact of social media on science, use of science in policy decisions.

In his interview, Dr. Frank Parrish gives a rich description of many of the projects he has worked on at the Pacific Islands Fisheries Science Center in Honolulu. He particularly details his work with monk seals, and many of the technological devices he helped create. As of this interview in 2016, Dr. Parrish is currently the Acting Ecosystem Sciences Division Chief.

Indexed Names

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Boehlert, George
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Brainard, Rusty
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Transcript -FP_001

Edward Glazier (EG): This interview is being conducted as part of the Voices From the Science Centers project funded by the Northeast Fisheries Science Center. It is also a part of the Voices From the Fisheries project that is supported by the National Marine Fisheries Service Office of Science and Technology. I'm Edward Glazier and today I'm speaking with Dr. Frank Parrish at the Pacific Island Fisheries Science Center in Honolulu. It's the morning of July 29, 2016. Frank is Acting Ecosystem Sciences Division Director and longtime supervisory research marine biologist. He's had a long career with NOAA Fisheries and, Frank, I thought maybe we could talk a little bit about what you got started; what was the inspiration for your long career? Frank?

Frank Parrish(FP): I guess, if I had to, if I had to pick one thing, it would have to be my father. But my father got into marine science because the, the whole, the whole society and environment was looking at science and marine science as the new frontier because we had the space program and there was this mirrored program also occurring where they were going into oceanography and marine science and you had the popular, popular things happening such as Jacques Cousteau and all of the, the media stuff. That all played a role in, in me being interested in marine science.

But most importantly, my Dad decided to become a marine scientist himself. And so because of that, he was working at General Electric in upstate New York and started to go to school at, at University of Rhode Island and got his Ph.D. in oceanography in 1972. And even though there was this nation, national interest in marine science and going that direction, there really wasn't a lot of work at that time. It never seems to be a lot of work. So he was moving every two years. And so I moved all over the place and probably the next big thing that contributed to my interest was about the time that I

was eleven, we were living in Puerto Rico, on the west coast of Puerto Rico, my Dad was down there working at the University of Mayaguez Nuclear Center and he was one of the aquanauts that was working in the habitats out there.

EG: Oh wow.

FP: So, you know, while I'm watching *National Geographic* and, and Jacques Cousteau on the TV, the two English-speaking programs that, that we got in Puerto Rico at that time, that was it, everything else was in Spanish--

EG: How about it.

FP: --you know, my Dad was one of these guys who was going out, getting into the habitat and going down and swimming around. And so for me what was very exciting was that my Dad taught me to SCUBA dive in Puerto Rico at that age--

EG: Wow.

FP: --and that was, that was a big turning moment for me. I specifically remember that one day my mother sent me up the street in the neighborhood, she said there's something I had to pick up from a neighbor's house, and so I walked up there and knocked on the door, and said to them, "my mother said that I'm supposed to pick something up here." And they pulled out a little forty-five cubic scuba cylinder, and they said, "yeah, your Dad wants this." I still have that cylinder today. I was in love with that cylinder. That was my tank. That was my scuba tank. And I went home, and I was not fit to be around. I was just completely excited about what this could do for me. And so that little forty-five cylinder and a double hose regulator and, you know, suddenly I was living the life of Flipper. I mean, it really was very much falling into kind of that vein. I was only there for two years, then we moved and we went up to Massachusetts, and then eventually my Dad's work came out here to, to the University of Hawaii where he was in charge of the Hawaii Cooperative Fishery Research Unit.

So I got here in time for high school, the diving continued, the enthusiasm continued. I volunteered with my dad to help with some of his work. I went through the University of Hawaii; I didn't apply anywhere else because this was Hawaii and this was the ocean, this was where I wanted to be, and so I spent my, my high school and college years diving for fun on the weekends out of boats and activities, and, and volunteering wherever I could.

So I probably, you know, during that time there were some other motivating things. Because marine science was kind of an area of expansion. I had a high school teacher named Kerry Chesser, who had a marine science program. So he put together the curriculum, he assembled the materials, he basically had an oceanography club and he would go SCUBA diving with his students on the weekends. I can't even imagine that right now, with, you know, the core curriculum and the certain minimums, the fundamentals that people are required to have and there's very little flexibility for teachers now because they have to deliver on a certain, you know, core mandate. But at that time it was amazing. He inspired so many people in that direction.

EG: What high school did you go to?

FP: I went to Kalaheo High School. It's a public...

EG: Kalaheo.

FP: Yeah, it's a public high school over on the windward side.

EG: Windward.

FP: And then when I went to the University of Hawaii they had the Marine Option Program, which was focused on just getting a cross section of students interested in marine science, and so you had, you had, you could have oceanographers in there, you could have zoologists in there, you could have artists in there. It was just people who were generally interested. But they did have some training. They had, uh, you know, marine, quantitative surveys that still functions today. They provided opportunities to work with different segments of the marine community. And foremost in that was Dr. Sherwood Maynard, I mean, he was, he was a great guy. He was a mentor to a lot of students and, and he made that possible. So he played a role in that as well.

I guess the, I graduated from, from the University of Hawaii with my Bachelor's Degree in Zoology in 1986, but prior to that I took a whole series of small, little, short jobs and volunteer things that got me in the Northwestern Hawaiian Islands, diving up there routinely. I worked with the State of Hawaii and I was on one of their ships and went up there, did a lot of work with them. I volunteered with Bishop Museum, did a bunch of different things that gave me a lot of opportunities. And in the end when I, I graduated in '86, it was, the interaction with the range of those people, one of the people who was working at the Honolulu Lab, which was the National Marine Fisheries Service here, was, was looking around for a body to, to do some, some work on a nehu project, and they, they...

EG: Nehu?

FP: Nehu.

EG: Yup.

FP: It's a small, little, anchovy.

EG: Yes.

FP: And, and they called me. They called me and I said sure and that was it. That was pretty much, that was the beginning of my NMFS career. I was, I was hired as a GS3 Biological Aide, and you know, I was picked up to do, I was picked up to do work here at the Center, at the, at the Honolulu Lab.

EG: Right.

FP: The, um, the thing here that I guess I would say, as far as, you know, what got me into the field, the thing that drove me, and it still drives me today, is the key is that I wasn't really, um, motivated by getting a college experience or going after, you know, more money or anything like that. It really was all about the adventure. For me, it's, I'll shamelessly state that basically watching people go out and do cool things and get in the environment and, you know, I still keep that SCUBA tank, I still have that regulator from when I was eleven years old, you know, just because it reminds me of just how excited I was at the time and then I still find myself very much excited today. So...

EG: Really, it's still a frontier out there. We know much more than we did, but...

FP: We know a lot more than we did. But we still are going out and we still, you know, we're still very excited about, you know, what could happen. And I guess, there was never any doubt that it wasn't going to be marine science for me. I didn't know how I was going to get there, maybe it would be marine engineering, maybe it would be something else, but that was pretty much, you know, what it was going to be. And I have to tell you, I, I was worried about what, what kind of, um, you know, livelihood and how I was going to make ends meet and all those other things, so I put a lot of other things kind of on the, on the back burner. I certainly wasn't worried about getting married or having kids or anything like that. I was just interested in my--

EG: Right on.

FP: --my adventure. So that, I think that answers question one.

EG: You followed your heart, sounds like.

FP: Absolutely. I followed my heart, there's no doubt about it. Um, what's the, you had other questions?

EG: So let's see, you, you eventually got a doctorate at UH, is that correct?

FP: Yeah, that's right. So yeah, I didn't actually go through the, um, the doctorate side of it, but because the doctorate side really does include part of the whole professional side, if you want to--

EG: Sure, sure, we can--

FP: --you want to walk all the way up to that?

EG: --we can walk up, sure, you got it.

FP: All right, so then basically what I would say is that if we're going to do that, I started in '86 with the, the nehu program, which was a, which was a, an interesting, interesting program and it was kind of a, an example of what was going on at the times. So in the 1980s, we had just finished up the Tripartite Investigation Program in the northwestern Hawaiian islands. And what that was, was that was spurred by money that came down for, um, from the law of the sea, where they basically had established the Exclusive Economic Zone, which extends out to 200 nautical miles. So when that happened, they

were able to get money to say, all right, let's, let's find out what's out there in the northwestern Hawaiian islands out on those summits and the seamounts and, you know, what resources exist at that location. So you really had a, uh, an organization and an, and an emphasis on what are the fishery resources, and what protected species issues are out there, and where do we go with it next.

And so after that happened there was what was called, they had what was the first and the second Northwestern Hawaiian Islands Symposium and a lot of science came out of that. And one of the things that was probably most relevant that came out of that, was that's where the dawn of the ecopath modeling happened. So the reason I even bring that up is, that that was done by Jeff Polovina, but a lot of the work that, um, that was being done in the Northwestern Hawaiian Islands while I was an undergraduate fed into the parameters, and the diets, that, that went into that. So I had had some involvement already by basically going up there and collecting just, the, the basic data and providing it to the scientists to go forward. So then when I came on at the Center as a biological aide, the focus was, was dialed down on that tripartite and we were going into a period of, of, um, kind of stock assessment and so there was interest and, okay, we, there was lobster up there, what was the, the amount of lobster. There was, there was armorhead up there that was in the, um, a foreign fish was taking it and making use of it up there, and so as a result that was outside of our EEZ, but it overlapped with our EEZ, so there was some interest in that.

And then what's interesting here is we also had one of the oldest fisheries still operating in the main islands, which was the aku boat fishery. And that was down at Kewalo Basin and the whole fleet was lined up there. And what I was hired to do, was to work in Pearl Harbor. So we're in Pearl Harbor right now at Ford Island, at that time, thirty years ago, I was hired to basically come down here, we weren't located here, and get in a small boat and go out and do collections of the small anchovy for survey purposes.

EG: Which, which is important--

FP: It is.

EG: --food source for tuna, right?

FP: That's exactly it.

EG: Okay, yeah.

FP: Well it's an important food source, bait source, for tuna.

EG: Right.

FP: Because basically what these aka boat guys do is they go offshore and they, they first come into the, the harbors, they collect these anchovies, they're coastal anchovies. They keep them alive, they take them offshore, and then they basically, little by little put it out off the side of the boat and they attract in the aku and the tuna to aggressively go after those, those anchovies. And then the bare hooks that they've got in the water get bit and they're able to, to whip the tuna back into the water. So the bait's very

important, because you don't get the fish without the bait. And so that was what we were focused on, was looking at the bait.

With that, we have the, the, that's, that's how I did it. I just spent about a year and a half working in that capacity, and then some point you're moved to, you know, a technician, you move up one level, you become a GS4 biotech, and then they started sending me to the North Pacific and I was working on, um, on the armorhead cruises, and that's where I started to work with, um, Mike Seki, who's our current Center Director. And, you know, we would go up there and it was, you know, it was a high seas, usually it was in the winter time. It was on the NOAA ship *Townsend Cromwell* which rolled terribly, and but you know, it was bottom long lining and we had, we had bottom trawling, we had aberdeen trawls and we would process big fish and it was really kind of the other extreme. Rather than a small, little cottage bait fishery to go out and run the aku boat, this was the other side where it was the big, you know, big harvest capabilities.

EG: A couple people have mentioned armorhead--

FP: Yeah.

EG: --and I'm somewhat familiar with it. Why was that significant?

FP: You know, it really wasn't very significant at all to the local commercial take for fisheries. The reason it was of interest was because we did have the EEZ put in place, establishing where the U.S. and where wasn't the U.S., and then we had a foreign fishing fleets making use of it up there. So--

EG: Okay.

FP: --Hancock Seamount, which fell within our EEZ, was a place of interest for fishing. And then the other seamounts, which were just outside of it, were getting fished all the time. So it, in some respects it was a really interesting seamount, seamount science exercise. And, and the reality is a number of, I would say that, you know, George Boehlert who was the, the Laboratory Director, either during that time or just after it, the, when I was, came in it was Richard Shomura, he was the Director, and that was Dr. George Boehlert, and he was doing a lot of seamount related work and that was where that focus was. But certainly it's a food fish, and, you know, people were, were collecting it.

So then, you know, you, do that, and then little by little, you know, other projects happen. There was the lobster fishery that was occurring up there and so we had a lobster monitoring cruise that would go up and would do standardized, standardized trapping and when I moved over there, that was, that was a situation I originally, for the nehu project, I had worked for Dr. Dave Somerton, because that was his program and the insular resource investigation, and then I had the opportunity, I was picked up by Dr. Jeff Polovina, who is of the ecopath fame, and he was doing, he was doing, kind of fisheries development thinking at that time. And one of the projects that he had was artificial reefs. And they were putting artificial reefs out on Penguin Banks with the idea of if we could put them down there maybe we could get a handle on where the juvenile bottom fish were and maybe we could develop some habitat. Because people were interested in artificial reefs at the time. So we did that, and...

EG: So this really was some early ecosystem work.

FP: Absolutely.

EG: I mean, not many people...

FP: Oh, absolutely, this was very much, a lot of it was ecosystem work. Because one of the things that we didn't have here, is we didn't have huge fisheries, okay? We, we had, we had some bottom fish fisheries, we had the aku boats going off, but we didn't have the big East Coast and Alaska type fisheries that you think about. And, and so as a result there was a lot of emphasis on looking at the ecosystem and how it functions. Ecopath, if you look at that, I mean, the first ecopath was done on a coral reef ecosystem, the most, you know, diverse ecosystem. That's probably not the place to start doing an ecosystem model but that was the first.

EG: Right. Early '80s, wasn't it?

FP: Early '80s, yeah, so it was probably in '82 or something like that when it came out in the, the tripartite symposium. So, so then yeah, I mean, as far as the artificial reef stuff, that was very interesting to me because that gave me the first opportunity to go get into a submarine which was very exciting, falling back on my shameless adventure thing, I was very, very excited about that. I'd seen my Dad basically working in and around them and now finally I had a chance to, to start working in them. So we had a number of dives associated with the, the artificial reef project. And it was, it was interesting but it turned out we never really aggregated any kind of juvenile bottom fish at all. But, you know, we, we made some progress on it.

EG: Where did, whose sub was that? How did you get?

FP: Yeah, the sub, that's an important point. It falls to the technology question. The sub was the Hawaiian Undersea Research Laboratory [HURL]. And that started in 1982 and it has basically turned into a real capability and we rely on it today. I am going out with it tomorrow.

EG: Oh wow.

FP: So, you know, in thirty years, I have continued to basically work with that, the group, and, you know, it, it was a turning time, you know, back in the '80s when they decided to actually take that capability on. That's when the Manned Undersea Technology Program of NOAA folded up and they turned over and became the National Undersea Research Program. But since that time, it's actually moved off and now the National Undersea Research Program no longer exists. And so things like, um, our submarines around the country are disappearing slowly, so HURL may disappear this year. This may be the last year we go out.

But yeah, as far as the, uh, working at the Center, you know, we worked on lobster, we worked on a number of things, and then somewhere in the middle of that, I started trying to go to school because I realized that, you know, I wanted to be a biologist. I was able to make the transition around the GS5 level and to a biologist by refusing a

promotion as a technician. I just simply said, keep me as a 5 and make me a biologist. And they chose to do that. Then I, I started to go to grad school. It was a little challenging, oceanography was pretty much focused on way offshore stuff, zoology, Department of Zoology, most of the science at that time was focused on basically, largely academic in nature, you know, looking at classic science, not very applied. There was some applied science, unfortunately it was being done by my Dad. So that was a real challenge because I couldn't use my Dad as an advisor. The whole thing about my Dad actually had a very big role in my career. In some respects it, um, propelled it ahead, and in other situations, I had to, I had to divert and go different directions because I couldn't go into that department because he couldn't be the advisor.

EG: Conflict of interests.

FP: Yeah. And even, actually, with the National Marine Fisheries Service, you know, because as I became a biologist I had to, I had to go to the Fishery Management Councils and I had to give presentations and I had to sit in rooms and, and my Dad would be sitting on the SSC [Scientific and Statistical Committee], he'd be part of that group, and so, so you know, I would get up there, and I remember one time in particular I got up there and it was one of my first presentations and, of course, the stuff that I'm looking at has relevance to stuff that my Dad did, so I'm talking about it in relation to what my Dad did before me. And then as I got there to make the presentation I realized, how am I going to refer to him; everybody talks to, you know, refers to him as Dr. Jim Parrish. And, and I realized that I've never called him Dr. Jim Parrish and so in mid-sentence I just made the decision to just go with what I always do, and refer to him as Dad. So I'm basically up there, explaining this, "...and if, see, if you look at this information and then we look at Dad's information here, you can see that things..."

Anyway, Bob Moffitt's in the back of the room, he's somebody that I work with, he's in the back of the room and he tells me later as he was sitting back there and I said that, that some guy leaned over and said, "who's this beatnik kid calling people Dad?" So, so it took time, but people got the, got to a place where they could put it together. But, yeah, so, when I went to grad school, I ended up becoming a geographer; that was the department at, at Hawaii that I was able to get into and GIS was emerging at that point in time, so I was just applying the spatial tools to, um, in this circumstance, was bottom fish; juvenile bottom fish.

EG: Geography is nice in that it can accommodate any different disciplines.

FP: It's interesting, you know, I, I saw it very much as a compromise but I didn't have a full understanding until later that, that it actually, um, it's a discipline that's actually where most of our sciences are moving to; the idea that, that you can do it, do your science without considering people is not working anymore. It used to be that that was always the case, and geography is the science of basically taking people and the natural world and putting them together and figuring out how it works.

And, and so, yeah, when there was this move to define, the move to go to ecosystems, in many respects geography itself was trying to figure out what its' relevance was in the world, yet it wasn't seen that it, you know, landscape ecology and things like that, in

relation to social, you know, social pressures, could, could be very important, you know, on the ecosystem approach.

So, yeah, I got a master's there and then went back and continued working and then, and then later I decided to go back and I got my Ph.D. there. But I just stayed here in Hawaii, I never applied anywhere else, and it was solely because this was where the ocean was, this was where the water was, and if you look at the, if you look at my, my education and, and you take it, you take twenty-five years from the time that I, actually you, it's almost, almost thirty years. If you take it, I was up in the Northwestern Hawaiian islands every single year for between thirty, thirty days and four months, every single year for twenty-five, twenty-six years. So that, that really did become my back, my backyard, my home. And, and I enjoyed it.

So yeah, I got my, I got my Ph.D. and that's, that was all part of being here, you know. It was, in some respects a compromise education because I couldn't very well take any class I wanted; I had to take things on evenings and afternoon hours, you know, I had to, I had to pick classes that, if I were gone for thirty days at sea, so, and then at the end we had some National Marine Fisheries Service programs come in, you know, the advanced studies programs and things like that, that helped me, you know, get a couple of classes that I really needed so that was good.

EG: I would think it would be nice that the lab was right there next to the campus, I mean, such a neat..

FP: It was essential. It would not have happened otherwise. The fact that the lab was located right on the University of Hawaii Manoa campus, it would not have happened otherwise. Because basically, you could slip out, you could do something, you could get back and then be able to still functionally put in the eight hours every day and things like that.

EG: It was a rich, rich area.

FP: It was. And it was actually a really neat time because it was not uncommon for me to be sitting at my desk and then the door would knock and open it up and it'd be a grad student from across there who had just walked over and was here for some reason and decided to come check it. You know, with the new security measures in place everywhere right now, that's a thing of the past. But the idea that, that, you know, you would just walk over and you'd knock on the door, that was, that was a very unique and charming point of being located on the, the Manoa campus, it really was great. So, um, I don't know, where are we going here. Did we, did we have something else that we wanted to hit?

EG: Well, we were, we were headed toward technological changes.

FP: Oh, technological changes.

EG: I would think that your geography and remote sensing background--

FP: Yeah, that was--

EG: --that would be...

FP: --I mean, that was an interesting thing because GIS really, we were very late to get into that. It kind of makes sense; you've got to have the data to be able to do that and there was a time when we didn't have great maps and we didn't have, you know, that all happened within the last fifteen, twenty years, we got, we got the great maps.

So, you know, I'd say the, the technological stuff, the changes that we've been seeing come on a number of different levels. If we go all the way back to, to when I started with the Center, the one thing that really struck me is that I was very much an underwater guy; very much a diver. And I came here to the Center, and the Center was not involved in that at all. We had George Balazs, who basically was doing some turtle work, so he would put on some SCUBA gear to go out and grab a turtle and [unintelligible] the turtle, but that was pretty much it; there was no other, there was no other stuff.

Prior to, just prior to me arriving there, was Rege Gooding, who was here and I, I only met him once but I, after he had retired, and, and he had done some interesting stuff with the release of lobsters in the Northwestern Hawaiian Islands, you know, throwbacks, whether they're getting eaten by sharks or not, so that, that was, there was one project on that. And I think there's one paper on that. But otherwise there really wasn't much.

When I came here there was six scuba tanks that were underneath the staircase that, you know, there was some old gear, and, you know, there was a guy who was called the Unit Diving Supervisor [UDS] and he said, "yeah, we really don't have any projects so, you know, this is, this is really it." And that was really hard for me, because it was very hard to get on the ships and to go all the way out, look over the side, and you have to understand, we're in Hawaii, this is a pretty... you know, impoverished, as far as productivity in the water, so our water's very, very clear. You can look over the side of the ship and you can, you can see the light penetrations a long way, and our water is warm. So it's actually really hard for me to be out there for thirty days, rolling around, doing everything, looking at potential places that I could get in the water, and not get in the water. It was very hard.

In fact, I have one story where this, this manifested, and I'd be interested to ask Mike Seki about it because he was the Chief Scientist at the time. We were up doing one of the armorhead cruises up there, and one of the projects that they had going was they had a drift project for drift gill nets. And they had put a, they had put a VHF receivers with, um, on them, and then set them adrift and they had been drifting for a long time and I guess they had some kind of way of getting a generalized satellite position on it, I can't remember what the term was. But our job was simply to drive over, find them, take a look at them--

EG: Observe.

FP: --pick them up and bring them aboard. That was it. And, you know, Seki basically probably knew that I was less than, you know, he, he said, "this will be something for Frank to do. We'll put him in a small boat, we'll lower him over the side, he can go over

and he can take a look at it." And there was a printed piece of paper that he said, "this is what the investigator wants you to do." And he handed it to me. So I read through the printed piece of paper and I was delighted to find that down, buried deep in the text, was, if at all possible, if you can get in the water and make some observations about this... Now, of course we didn't have diving gear on board, we didn't have anything else, but I don't go anywhere without my mask. So I had my mask, I had the piece of paper, I got into the, the boat to go out there, and I have to confess, I, I didn't make it obvious that I had a mask with me, and so we drove out there, the guy came up to the side of the, the net in the water, and, um, and I said, "okay", I said, "before we pull it aboard I'm going to jump in and take a look." And of course he's the coxswain, he's just doing what he's supposed to do, and I'm the, I'm the, I'm the scientist, so I know what I'm talking about, so I took a nice big breath and put in my mask and flipped over the side--

EG: Oh, here's a mask.

FP: --and went down - that's right, I pulled it out underneath my shirt or whatever, put it on - went under and swam around looking at what was down there. And there were a bunch of barracuda, there was a bunch of stuff, it's actually really cool, there was a lot of neat stuff there. So I made a nice thing around, and then when I got to the surface, my head broke the surface of the water, there was a loud blast on the ship's horn, there was several blasts, there was a radio squawking on the thing on the boat, there was a whole bunch of stuff happening. And all of a sudden the coxswain's going, "I think something's going on, you need to get into the boat." And I knew what was going on. So we got in the boat, we drive back over to the ship, Mike Seki's got a very exasperated look on his face, going, "Frank, don't jump in the water!" Okay. So we get back aboard the boat, we get the net on there, they read it, yeah, sure enough, it says I'm supposed to get in the water. But it was really a good illustration of me, that NOAA wasn't ready to get in the water. NOAA wasn't, NOAA wasn't at that point. They weren't at the diving point.

EG: Interesting.

FP: And for me, that was very, very hard, because, basically, I had just joined an organization that I thought should be ruling in that direction. So for me that was the big change. I wanted to see the technology, I wanted to see it go, you know, forward, and so I really started pushing the diving side of things. And you can't say we need diving. What you have to say is, we have a project that basically needs diving as a support.

EG: Of course.

FP: So I started, I started working at it real quick; one of the first things that happened was that the guy that was in the UDS position, Al Everson, he was just supporting the Center to the, or the laboratory, to the degree that it needed to be supported, took a detail somewhere else, so they made me the UDS. And then I did some things. I made a, set up the first NOAA reciprocity agreement for diving with the University of Hawaii, so that I could have the University of Hawaii divers, because we didn't have any divers here at the, at the Center, other than, you know, myself and some others. And then we started creating projects.

So we had the lobster project and we started looking at habitat-related type problems; I consider myself a habitat ecologist, and we started doing different programs. One of the things I did was I took an activity that I did during my high school and college years for fun, because I have a boat, and it's called, it's called tow-boarding, and what you do is you have a board behind the boat and it basically tow the diver on it and he can use it like an inverted kite and fly around and survey the different bottom. So I started building pear tow boards so you'd have wing mans on the bottom. We created these things so that they would have downward-looking still cameras so they would capture things, above the habitat we had an oblique looking video camera which would give us a real-time feed. I built a telegraph systems so that the diver could communicate with the boat and then vary the speed, the direction, stop it, do whatever they needed to. We put in counters, we had slates on there so that notes could be made. We put a sonar on it so we knew exactly the height off of the bottom so that we could have that standardized so we could digitize it.

EG: Fantastic.

FP: And the whole point here was to try to get to a point where you had systematic habitat collection information and fish count collection information. What we were doing it for was one, to look at the habitat where we were doing our standardized trapping for lobster, and we were also using it to see to what degree lost traps were occurring on the bottom and ghost fishing was, was a problem. And those, that, that tow-board technique we did for a number of years, and, and now, you know, what is it, ten years later? We, we started, yeah, in 2000, we started using that as part of our coral reef program and now that is a primary mandate, they use every single, they, they go on every cruise, everywhere, they do it. It gives you a scale part of the habitat. That came from just weekend fun. That's all that was, it was weekend fun. I brought it to the Center, NOAA diving, they could've stepped in. They, Cliff Newell, who was the Head of the Diving Program at that time, came down, he came up with a way for us to do in-water recompression so we had a decompression option down there, using oxygen and a helmet and all that...

EG: What depth are lobster up there?

FP: Well those, we were working on the Banks, so they're out there at forty meters.

EG: Forty meters.

FP: So that's a hundred and twenty feet. So we're actually working quite deep.

EG: Right.

FP: And he came down and he looked at what we put together and he, I have huge respect for him, he basically said, "okay, you know what, I don't know anything about this", but, you know, he asked a bunch of questions and I gave him the answers, and he says, "okay, all right, make this work, you know. Make it work." And it did. And, you know, when it, I first talked about doing this, people were calling it the trolling for tiger shark program, there was all kinds of, you know, the bend-o-matic machine, there was all kinds of stuff. It is without a shadow of a doubt a functional thing. Now, the

Australians use it. They would never put SCUBA divers on it, ever. No one else does. And the reason why is because it's assumed to be too dangerous. But we've shown it to be a very valuable tool.

EG: Excellent.

FP: So that's, that's a technological advancement that we now have today.

EG: That you were more than directly involved with...

FP: Yeah, yeah, absolutely. You know, basically, with the habitat surveys and, and, and the things that we were doing, we started doing, getting into telemetry, where you get the tagging, but at the time those tags were so small and the fish we were tagging were, well, the tags were so big and the fish were so small, the tags were actually bigger than the fish. That was a problem. We ended up finding the juvenile bottom fish eventually; they were not where we thought they would be. They were out on a featureless mud plane and there was a nursery ground, and so we wanted to see what the movements were. The problem is you have this fish that's probably between six and ten inches...

EG: What species is this?

FP: It's the, this is *Pristipomoides filamentosus*, so this is the Opakapaka.

EG: Ah, yeah.

FP: The pink snapper. This is what shows up on everybody's plate and they love to eat. But we were trying to figure out where the juveniles went, and the problem is the fish is probably, it comes in at ten centimeters, and maybe at twenty-five centimeters it leaves the grounds, and so you've got a twenty-five centimeter fish that you've got to be able to, to acoustically tag, and then your tag is, is pretty big and so you fish, bring it all the way up from deep water then you've got to, you've got to bleed all of that air out of its' bladder, then you put that tag inside that fish and then you let it go over the side and unfortunately the tag only lasts for five days. So you have this fish that now lost all of its' buoyancy and you've added payload to it, and now you let it go back down to a couple hundred feet where it gets compressed; it's probably going to sit in the mud.

So we came up with a method that basically allowed fishermen to fish, they bring the fish up, and then the divers would intercept them at a hundred feet, and so we would get the fish, we'd take it off the hook, we'd put the transmitter in the fish, we wouldn't pop it, and then we'd put it inside a cage that was suspended to depth and we'd see that they swim around and then we'd send the cage back down and release the fish, so the fish basically would have the additional weight without losing its' flotation bladder, and so then it would be able to, it'd be as if it just had a big meal, but it'd be able to move around. So we were able to track them over those five days--

EG: Ingenious.

FP: --without them being...

EG: Yeah.

FP: So we also used that technology so that, or that methodology so that, um, when we were studying the diets of fish, what happens is that you reel them to the surface and their bladder expands and it pushes everything in their stomachs out their mouths. So, instead, we had them reeled up and the divers would intercept them and bag them. And so they'd be bagged and they'd come up and they'd barf out, but all of the food contents would be there--

EG: Intact.

FP: --so that you'd be able to do that. We did series with a ghost fishing experiments where we had the traps on the bottom and then we would, we would take lobsters and we would tag them, we would put them in the traps, and we'd leave some baited and some unbaited and we'd look at the movements of where the lobsters were and how they would come out. And we found out, you know, to what degree that, were lobsters stuck inside the trap, or were they able to come out when they wanted to. And we found they actually could get out when they wanted to. So that, that allowed, you know, because there were a lot of people pushing for a rot-out panels, but it turns out that we really didn't need them for the lobsters that we could see.

So, yeah, it was a number of different things that we worked on. There was just general surveys looking at fish communities, things that were never described before, no one had ever described the fish communities on the Bank Summits, so there's a bunch of stuff that started getting us, you know, in that direction. The diving stuff was a big part of it for me because that was what I could bring to the Center. I could bring that and the Center didn't have it. And then the question was just to what degree did it contribute to the range of projects that we had at the Center, and you know, initially they were fisheries projects but then they started to shift to protected species products, projects, and then ecosystem projects.

So for me, I was making good progress on the bottom fish thing, we did some great stuff associated with the, with the lobster thing. And then one day the, uh, the Director, I guess, talked to, I think it was Jeff Polovina who was my supervisor at the time, and Jeff called me in and Jeff said, "yeah, we need to change your emphasis. There's a, there are some issues that need to be worked on, and, you know, you need to choose. You can either work on turtles or you can work on monk seals." At that point I said, "okay, I'll work on turtles." And he said, "wrong answer." And he said, "no, you're going to work on monk seals." And, um, and the reason that was, is that there was, there was concern that the monk seals' decline was tied to the lobster fishery. And so I got moved over to work on seal foraging, which was a Director's decision, or a Center, or a laboratory decision. And I have to tell you, I wasn't real thrilled about it. Um, you know, when I got, when I got brought on to do that, I certainly knew where I wanted to go with these other projects, but this is what they needed. And they moved me over and what I appreciate is they said, "Frank, work on it any way you want, but we need progress on that. We have people that are working on seals and they're doing it from the beach and we have people complaining that, you know, but we don't really know where the seals eat, we don't know what they, what they feed on."

So I, I, you know, I looked at it from the underwater side. I said, "okay, the problem is that, you know, we don't know what these seals do once they go down there. And what I'd really like to do is I'd like to eavesdrop on the seals; I'd like to be able to see what was going on", and I, I daydreamed about building a camera that we would put on the back of the seal. And I remember thinking, man, that's unrealistic, I don't see how I'm going to be able to do that, I just don't have those kind of skills. But, once again, watching TV, watching *National Geographic* as I did when I was seven and eight years old, ten years old, I'm watching it, and then they have one of their little serial shows and they show a turtle with this really big camera--

EG: Camera.

FP: --on the back of this turtle, and I remember, okay, that's the right idea; it's way too big, but that's the right idea. So I picked up the phone, I called *National Geographic*, and I talked to, uh, Greg Marshall, who was building Critter Cam at the time. And I just simply said, "hey, you know, I saw this thing on the show, it's too big, I just think that it, you know, it might be, it might be the right idea." And he stopped me mid-sentence, he says, "okay, what you saw on TV is way old. That's not, that's not what we have now. We have totally different stuff now." So he kind of detailed what he had, which, now all of a sudden was down to the size of a small thermos, which for a monk seal was, you know, was manageable.

EG: Reasonable, yeah.

FP: And, you know, I told them, "look, I need you, I want you to come out and I want you to work for us, not work for us, I want you to work with us collaborate with us." And, and I said, "you know, we're, we got the story for you. We got an endangered species, we're going to put a camera on the back and you're going to have crystal clear water, so even, no matter what it sees, you're going to get great images because we have spectacular visibility and I'm going to take you to the Northwestern Hawaiian Islands, which is just full of apex predators, and there's just going to be lots of great stuff", and I didn't even have to pitch it that hard, he was like, "hey, I'm on, you sold me--

EG: On the plane.

FP: --on, on the fact that it's an endangered species and we could, you know, we could help." That's, that's what he said. So that started an eight year project, and one of the first things we wanted to do was move the cameras to smaller sizes so we could get it on smaller animals. So we wrote, we wrote a number of proposals, we managed to get some money for them to develop the cameras to meet our needs, and so over those eight years, you know, we really pushed that whole technology. And, you know, that, that resolution of, of information, being able to see a seal go down, say "okay, I only want to see it below a certain depth", have the camera turn on, have us be able to see, you know, what's, you know, what's going on, whether the animal's eating, what kind of habitat it's in, what its' activity is, being able to record the sound, some of the cameras basically had night vision so you could do it at night, I mean, we really, we really were able to push this.

And what I want to say, what I want to say about that camera system is it wasn't the whole story. It was the compass that pointed us in the direction to use our other tools, and we had lots of other tools so that was just, the SCUBA divers doing the surveys, that was putting archival instruments down to, to record when the seals would go and search a rock, we had electric rocks that would basically, when they moved, because they were so big, the seals could move them, they would record the, you know, the, the presence of the seals at that time. So it's kind of like a turnstile in the subway--

EG: Interesting.

FP: --you would know when somebody came through. You know, we had, we had shrimp trawls that would be on the sand, because we found the seals were feeding in the sand, we stopped thinking about coral reefs. Everybody told me that when we started working on the seals, the seals live in the atolls and that's what they feed on. Our project basically showed that they feed outside the atolls. They feed out on the open bottom, they feed in the sand fields. They feed on things that, they're not feeding really on the lobster. We actually have video images of where the seal was feeding, came up in the middle of the night, and there's a lobster right in front of it, standing out in the open, and it swims around it and then just keeps feeding. So maybe they did, at small sizes, maybe they did when there were lots of lobsters around, it was a very contentious issue. It got debated in every venue. But in the end, we were never able to really show that that was, you know, that's what it was. What we were able to show is that the seals eat a cross section of bottom associated fish; mostly outside the reef, sometimes inside the reef if the, if the, the sun is down. And, and we were able to use a number of different tools. We also saw they went sub-photic, which brought the submarine into the picture. So then we were using the sub to go down and look at the, the habitat areas that they were foraging.

EG: How deep is that?

FP: Well, the deepest they got was down to about 500 meters.

EG: Wow.

FP: And one of the, one of the most interesting things was we were using tags on the backs of the seals, so they were satellite tags, they would give you the positions on the surface, and you would see these clusterings and you'd say, "okay, why, why are they clustered here and not here. They're swimming all the way offshore, going to just these sites." So they were deep sites so we got the subs, we went out and we surveyed those sites and then we surveyed the adjacent areas which, they weren't spending their time at. And at the sites where they were, they were focusing their dives, we found patches of deep-water corals. And with those deep-water coral patches, you know, that, that was, that was an interesting question, okay, are there more fish associated with deep-water corals? And, and the reality is, you know, we really couldn't show that there were more fish associated with deep water corals. But we did show that if there were fish in the area, they made use of those corals. And so, you know, we put some cameras with night vision on seals and we found that, you know, they were going offshore, and we found that they were actually feeding amongst the, the coral trees and, uh, and then they

would come back to black coral whips, and so, you know, it, it, this technology played a huge role in redefining what was going on.

EG: Some aggregation going on?

FP: Oh, yeah, some, some big aggregation.

EG: Fantastic.

FP: Yeah, now it's, we also, you know, applied other things. We used, we created drop cameras, I remember that was something we did for the juvenile snapper thing. The idea was just make a frame, put a camera in, run the camera, put some bait on the end of it and run it down. Well, now we have baited cameras, okay, so that first paper I think they got written on that was by, um, I think it was by Denise Ellis and Eddie Martini, they took, because I put this camera together for it and then one of the things about, one of the frustrating things about being a young scientist, especially if you're a technician, is you can come up with ideas and they get handed to other scientists. That's hard. Ask anyone who's out there, you'll never get over that. You'll build things and they'll get handed off to other people. And it's supervisors trying to hand it to people who have the talent to basically carry it through to a full project. I think that, that probably, that probably occurs everywhere, in every situation, it doesn't change. So you build these, you build these things and then they go off. And, and that, the baited camera thing was one example. But we also used those cameras to scout diving grounds and look for habitats and we still use it today, when we go out, we throw a camera first and then we can invest the diving.

EG: Working with these species, endangered species, did you have any NEPA trip-ups, or, was, did you, how did you deal with that?

FP: In the early days, we were pretty unaware of the whole NEPA [National Environmental Policy Act] thing, simply because we were part of the Southwest Fisheries Science Center. We didn't become the Pacific Islands Fisheries Science Center till, you know, much later. And when we were part of the Southwest Fisheries Science Center, all of our NEPA was handled by them. So they did the NEPA for the whole region and we fell under it; they knew what we were doing--

EG: Okay.

FP: --and they would just basically write it in.

EG: Yeah, yeah.

FP: So yeah, that is, that is, that's a relatively recent thing. It was, it was a tough, it was a tough, um, it was a tough time when we, we came on as a Science Center because all of a sudden there were all these things that the Southwest Fisheries Science Center used to do and we had to learn how to do that. And, you know, NEPA coverage and all that kind of stuff, suddenly we had to accept all of that.

EG: Your workload would've expanded.

FP: Yeah. So. Let's see, are there any other technology things that, uh, trying to remember. I mean, there's certainly specifics on the technology if you wanted to just think about how things changed over time. If you just look at the tagging; tagging went from spaghetti tags that we put on animals that you would throw them in the water, then you'd catch them again and you'd go, I marked him and now I've caught him again, maybe he moved from here to there, maybe he grew this much, that's what you used.

EG: So direct observation.

FP: Yeah, direct. And then we moved to the electronic world where you could, you could put a tag in there, you could track it real time. Early on tracking it real time meant that you, you had to stay on top of the tag if it was moving around. So we would, we'd go on a little seventeen foot Whaler and we would sit on our fish for the five days that we tagged it, and you know, we would just, the sun would go down, out there at night, sun would come up, we'd trade out people in the boat and then it would keep going.

EG: Wow.

FP: So you just, you'd stay on it.

EG: Labor intensive there.

FP: Very labor intensive but then high resolution, you knew everything that the animal did. Then they moved to receiver stations, which you could have certain areas monitored but if there was time spent between those areas then you wouldn't know, right? And so. But most people have gone to that now. And now the sensors, you know, include depth, they include accelerometers, they include, um, you know, the ability to, to use tags as bio logging so they'll give you the environment conditions. You know, then there's the satellite and there's the, the being able to just track it over long time, the pop ups so they archive and then they pop up and they come up.

EG: For, mainly for tuna, or, or do some of these work for other fish?

FP: They use them for everything.

EG: Yeah, is that right?

FP: They've been using them for the big fish and, you know, they're using them for protected species, so, you know, the whole satellite tags and, and, you know, now they're using acoustic tags on cetaceans so they actually can hear what the cetacean noise is that they're making, so in a, it's really moved from mark recapture to basically being much more environmental, behavioral studies.

EG: Right.

FP: Um, as far as the, um, as far as the other thing that is big for us is our, our submarine capabilities, as we talked about it, in 1980, they formed the Hawaiian Undersea Research Laboratory. It was, it used to be the *Deep Star II*. It was a, a sub that was used for commercial harvesting, it got donated to the University of Hawaii, so they formed this, this group which was part of NERP, was the University of Hawaii and NOAA, and

then, you know, in '86 they got the *Pisces V* which is a, the yellow submarine and it goes deeper, so the, the Star II or the Makales [spelling?] what they call it, it's sitting at the Hawaii Ocean Center right now; only went down to about 500 meters. But now the *Pisces V* goes down to 2,000 meters and then in 1993 they got a ship, the KOK so now they had a ship that would allow them to take it all around the Pacific, whereas before they could only work in local waters. And then in '98 they got an ROV so they had a camera that they could survey with so then they could invest the dive. Nothing's worse than getting in a sub, getting down, and seeing it's sand. It's a bummer, all you can do before was maybe some crude mapping, but now they had the camera that they could actually look with the ROV. And then, what is it, in 2000 they got the *Pisces IV*, which is their white submarine, so now they had two submarines. They were the only operation in the United States with two subs so that if you got stuck on the bottom, the other sub could come down and get you free. Or you could down with two subs at the same time. And then in...

EG: Wait, are these at Coconut Island, or?

FP: These are located at the, um, these are located down at the University Marine Center at Pier 35 in Honolulu.

EG: Okay.

FP: And, um, and then you know, it, uh, 2012 that was the end of NERP. So we're looking at, you know, they didn't die, it's 2016, they're still alive but they're saying they're probably not going to be here next year. So now we, I mean, what happened when they ended NERP is they created the, um, the Office of Exploration and Research, they have their, they have the *Okeanus Explorer* and so, you know, we have new technologies now with kind of less addressing our fisheries issues and are more addressing the ecosystem issues. So in the last years, rather, with, with the *Okeanus Explorer*, we have like our deep sea coral initiative for about three years going on here in the local areas, it's going down and it's exploring. So there's some overlap, we use the sub for some and we use the *Okeanus Explorer* for others.

Now, these are the real time, uh, you know, broadcast of what they see on the bottom. They send these down, they basically send signal and they stream it out so people, you know, in their living rooms can basically see the dive while it's happening, so it's a totally different type of technology and a way of operating. So, um, that's the submarine side of stuff. I guess when we were talking about protected species we... what questions do you have, I want to make sure I address whatever your questions are.

EG: Sure, sure. Well, we were walking through the technology, I was going to ask you a bit about some of your favorite or most important projects and outcomes...

FP: Well, I guess, yeah, I guess the favorite project would be, I have, I have about three of them. The first one, the one that probably made the biggest difference in my career was the monk seal one. And that's the one where leadership decided that I needed to work on something else because they needed it done; that was the one that I wasn't thrilled about doing, that was the one that turned into the wildest adventure. That's the one...

EG: It had quite an outcome, I mean people didn't realize what seals were doing.

FP: Quite an outcome, it got me much more exposure. I mean, normally you don't get any exposure at all, then suddenly, they made a one-hour *National Geographic* special on the findings of it. It was an interesting situation for me because I was out on the, the sub, on the KOK with the submarine and I, we were doing an ROV operation at night, I was down in the galley getting something and they had the, the live feed, or the, the television feed from shore coming in and the crew was watching TV and I'm sitting there filling my M&M thing or whatever and I look up and all of a sudden they come up and there's this show about the monk seals and everything like that, and there's me on the TV show and I'm thinking, holy smoke, you know. And then I come home from that cruise and everybody's talking about it and then the next thing that's happening is it's being played on, on a Hawaiian Airlines, from the mainland, they're showing it so I'm getting texts from people saying, yeah they're showing this. It got a lot of exposure. And it did a really good job at, at addressing the message about what the problem with the monk seal is. Because what was happening is monk seals were going down and nobody could explain why it was. We, we limited our fishing, we, we were closing it off as a, as a monument. We put long liners fifty miles offshore, what, why is it continuing to go down? And what we did is we basically got a good handle on what the habitat was that the seals were feeding, the fact that they were feeding a cross-section of fish that were basically tied to the Hawaiian archipelago so, you know, the oceanography's got to come here and inject it into us, or else, you know, it's not like the seals are going to be able to go off and get those nutrient rich environments where there are fish. They, they, we really are dependent on the oceanography that drives the system down here. So the environment changes, the seals will suffer.

EG: Yeah. So at the same time, the population was improving in the main islands, but--

FP: In the main islands, it was improving--

EG: --you're saying that--

FP: --and so that was--

EG: --yeah, the conditions.

FP: --people were saying that the reason we were losing seals in the northwestern Hawaiian islands was because we had harvested all of the lobster up there and they had nothing to eat. Well, we have no lobster in the Main Islands, none, and yet our population is growing. Clearly something else was happening. And so there's a number of things, it isn't one thing and that's what's important here, is that people need to realize that it isn't one, one problem. It's a number of problems.

EG: These are complex systems.

FP: It's a complex, you have the oceanography changing, the environmental situation changing up there. You have marine debris coming in and basically creating entanglement hazards for them. You have a situation where we did have fisheries

operating and they weren't removing the competition for, of the, um, of the, uh, they weren't removing the, they weren't creating competition for the actual prey items that the, the seal was going after, but what may have been happening is they may have been dis-, unintentionally advantaging the competitors with the seals. For example, when you throw back old bait or when you throw back, what are the, the, when the traps are pulled and you have all the little fish and the little crustaceans and things like that falling out of the vents like they're supposed to. You may also have jacks down there consuming them. If you look at the Critter Cam footage and you look at the seals out there, when they're basically trying to forage, they're escorted by jack and sharks which are there taking advantage of the fact that the seals can flip over things and spook the prey. Well those, those other fish can't do that. They are very good at outcompeting the seals for the item once they're flushed from cover--

EG: Interesting.

FP: --so we're not talking about competition because one animal eats one, one species of animal and this animal happens to eat the same species. No, it's competition in that these jacks are trying to get the exact same fish that the seal is going for. So that's another thing, you have that competition, you have the, the marine debris, you have the oceanographic changes and you start adding all these things up and there is, there's low.

We had sharks start taking pups off the beach at French Frigate right in the middle of our time series where we'd been watching seals. So we had ten years where that wasn't a problem, then all of a sudden Galapagos sharks which we'd never seen before start eating pups and they've taken 200, they've taken 200 pups in the last twenty years or whatever, or fifteen years, I'm trying to remember what the number is. And so as a result, why would that change? What is the difference there? Well, the oceanography went down but we also stopped the fishery, right? So then the fishery, maybe the throwbacks, maybe that played a role and that's about the time that that started to pick up. We don't have the answer but we now know that we are supposed to be asking certain questions and so we did make a transition from fisheries to protected species to ecosystems. And so that's what I, a big part of it was the ecosystems and now you're starting to see ecosystems being driven by climate and so now they're moving to climate.

EG: Interesting.

FP: So.

EG: So you've got a much better grip on the parameters if nothing else.

FP: Absolutely. That was the big story for me, is it got, it got me to a place, I mean I was not the least bit interested in the project, and then I found that by working on seals and seals live on the beach, they, they swim in the atolls, they sleep in the atolls, they go out and they, they fish on the slopes, they feed in the sub-photic, they travel between the islands; it turned out to be the single best guide for me to the underwater world. So, seals actually was a way for me to start working on other projects. I mean, the fact that the seals went down and started showing interest in deep sea corals, at the same time I

had been put on as the, the Precious Coral Planning Team Chair, so those two separate things all of a sudden--

EG: Came together.

FP: --came together. I'd say the other projects that I've enjoyed, I've enjoyed the Precious Coral Project, you know, it's, it's very interesting to me, most of it occurs in the sub-photic. We have some black corals that are in, in the, in the upper, upper photic zone...

EG: Is this Malukihi [spelling?]?

FP: This is the, the deep sea, when we have deep sea corals which is what, you know, people are typically thinking about now because we're studying the deep sea ecosystem, but before, where we learned the most about deep sea corals was when there was, people were interested in precious corals, and this is the jewelry that people wear.

EG: Right, there was the dive fishery.

FP: That's right. So, off Maui, there was the black coral fishermen and they were deep divers who would go down and harvest, bring it up and then basically sell it for sales, but then there was also the early stages, there was the *Deep Star II* which was the submarine that worked out of Makpu Bay [spelling?]. And it would collect the pink corals and bamboos and the golds. And so, you know, when we started working on this there was a, the nature of the fishery is that it's a pulse fishery for the, uh, for the submarine fishery. Because there's only a certain amount of money you can mobilize to do it. You do it for awhile and then it folds up and you've got to let the corals recover and then you go back out and you, you do it again. And so with that pulse fishery, we were doing some research to see that, do we have the growth rates right, you know, do we have the, the estimates and the numbers right. We were looking at things like the, and for me, it was pretty exciting, I got particularly infatuated with the gold coral and I just found that to be a really, really interesting story. It was one that we were harvesting and I couldn't really explain, based on what we, we didn't know anything about its' life history, how it could be growing as fast as our estimates were, and our estimates were largely based on using black coral that occurred in shallower depths as a proxy...

EG: Sub-photic...

FP: Yeah. So, the sub-photic ones, you know, they were, at one point there was something that said it grew about six centimeters a year which is just, it's just too fast. But I did some, some work where we went out and we put some, um, some pots down, I went and put little pots, I marked them and I said, "you know, maybe I'll be back in a decade and we'll take a look at it." And, um, and before I could get back somebody did radiometric work on them, samples, and said "hey, we've got, we've got thousands of years here." And when that got said, you know, we're, we're commercially harvesting it, and that was, that was something that we really had to struggle with. The Fishery Management Council and all the researchers, we spent a lot of time debating well, is it

real, do we believe this, this radiometric stuff, it's, it's done on a protein skeleton, does it make sense.

So when we went back out after a decade, I was able to go back and find all my corals and we were able to measure them and that was the validation point. So there was a lot of debate, yes it is, no it's not, but putting some tiny little flowerpots on the bottom of the ocean with numbers on them next to the coral trees and just setting them up, taking some measurements and coming back ten years old, ten years later, and then measuring them again, gave you, you know, a sense of whether there was any appreciable change. Certainly in ten years, if it's a six centimeter a year growth you would expect sixty centimeters, which you should be able to measure without even any kind of a yardstick or anything like that. And of course, we, we didn't see any difference at all. So yes, indeed, they do take a thousand years or more to get there. So, you know, the Fishery Management Council...

EG: Quite an implication for management.

FP: It did. And you know, they chose to put in a moratorium at that point. They just said "okay, that's, that's not the way to go."

EG: Well that's, that's fulfilling for someone like yourself, I would think, to be able to...

FP: It was, it was but you know, it's tough because there's, being a National Marine Fisheries Service biologist, you're an applied scientist. And the applied science gives you the ability to go out and start looking at a topic. But what happens is, you get to the place where you get your answer and then there's this desire to have you work on something else. But when you look at it, you may have gotten the answer to your applied question, but you see the way to answer the bigger life history question, or what's going on, or why something would happen. And a lot of times we have to walk away from that. And it's really hard to walk away from what is, at the core, probably the most interesting scientific question, and then go to the next thing that needs to get done, because it needs to get done, you know. People have needs, scientific products and support they need to, to know for management, and they've got to direct you. And that's what got me into seals. They redirected me to get me into seals, and that's just the nature of the business. So.

EG: Can you, can you hand off some of those questions, or data to...

FP: Well, certainly they do. I mean sometimes those questions get handed off to, to university types, they pick it up and, and they go with it. You know, as a scientist here, the primary mandate is on whatever the applied science is that's deemed a priority that we need to work on. At the same time, you don't, you don't give up the project. If you look at my resume, you will see that, that my stuff that I started back, you know, early on with juvenile bottom fish continues to appear periodically throughout, you know, papers come out. All of a sudden, I'll see an opportunity somewhere for some money and then I'll get a sub dive, you know, that I can go out and I can actually continue to work on the life history of gold coral. And a paper will come out. So it's not your fulltime job, but it kind of, kind of becomes your hobby on the sideline because you just, you just, you can see that the story is there and it needs to be told and you're trying to, you're

trying to make sure that it gets out. But you still get, you know, you still get redirected to, to whatever the primary job is.

EG: I ended up asking someone else, these are some fantastic careers, do you feel like you can transmit the knowledge, or, or, are there folks coming in from universities that can, can carry on this kind of work? Can you play a role in, in nurturing, you know?

FP: I would, you know, I would like to play that role. I think that one of the things that's been, I think we have people at the Center who've done a very good job at going and interacting with university, being on committees. There was an interest in that. I offered my services at one point in time, but a lot of times it just comes down to whether the person finds you and decides they, you know, that you can help them. And I've had two or three people do that, maybe more, like maybe five people, I think about. You could count them on one hand. It's not a lot. Because most of my stuff has been basically out generating the products.

We have people at the Center who, you know, tend to be modelers, tend to be program leads, and those people they tend to, they tend to be moving, you know, they have money, when you have allocated money and you can put money towards something, you can bring people in. But I've had, I've had a number of people approach me typically because of my expertise. So somebody from all the way over in, uh, in Halifax, you know, basically said, you're working on that fish community and you know that can, and so I sat on their committee and, you know, somebody on their deep coral committee, I just, I just did that, you know, I sat on their committee. So yeah, there are people who can do it and they can pick it up. I would, would like to actually do more of that in the future. It's one of those things that at the same time, I don't want to be the guy who's promoting it or pushing it if, you know, if it's something that they want, they should, they should let me know and then it'll be there. We do have some great people here at the Center who've done a lot of that though. But for me, it's actually been a small amount of the, the work. I've been much more the field guy, much more the operations guy.

At one point, the field and operations no longer was a pioneer effort. If you think about it, you know, going out and doing the diving, they hadn't done this at the Center before that way. I was a pioneer in that respect. Even just going out and having them put a boat over so that I could work independent from the ship as it was operating, that was something they didn't do. Well, that's what we do now; we have all these boats that go out. We have a whole yard full of boats. We had one boat and I got, I grew to three boats when everybody who had a boat they wanted to get rid of, they would dump it on me from different agencies and I would use them. So we, you know, we kind of got this whole period of time where I kind of duct taped it together.

But then we finally got the resources that we needed and it came in through a variety of sources. We had the coral program, you know, I was working on coral stuff and then we had the coral program and then Rusty Brainard pitched it and we got real money. Marine debris, Ray Boland had a volunteer group of divers who went out and did it and they brought in whole marine debris funds and they built the coral reef program based on that. So suddenly there was money for boats, there was money for charter ships, there was money for staff, there was money for all these things. And with that, you

know, came all the, all the university involvement and so that played a, that played a big role.

One of the things that happened is once that happened, then NOAA also had a bunch of rules. We had a bunch of rules and regulations so for example, we used to put a boat in the water, go out, throw an anchor, flip over the side, do our work. Now you've got to have a boat driver, now your boat has to go through certain qualifications and inspections, these are all things that just improve the quality of life. I just recently went out and did an operation for the first time, I just told people where I wanted to go, they got the boat together, they put it all in there, they set up the plan, they did everything, I just stepped into the boat, they took it out, put all the gear down... I didn't even have to be there. So we've gotten that professional and that well put together.

Problem with that is that kind of leaves the pioneer kind of standing on the side going, okay where do I fit in? And that's how I, that's how I ended up kind of being a, a Division Chief. I think they, they were trying to figure out what they were going to do with me at that point. So they moved me over and to kind of being in the administrative thing. So I still try to do a little of both. Because I, I love the stuff out in the field, I love it, so I still try to do a little of that.

EG: Well, can you envision carrying on after your tenure is over?

FP: When you mean carrying on, what do you mean?

EG: Carrying on, carrying on, I don't know, getting into the water with dive gear, I, I can't imagine you ever--

FP: Well I still do it

EG: --letting up, okay, yeah, yeah.

FP: In fact it's, I've gone full circle. Started in the 17' Whaler that, you know, my Dad bought and we used in Puerto Rico, kept it in high school, went out and did my, my fun activities there, moved to the Center and have the, the National Marine Fisheries Service had the career, kept the boat, dove the whole time.

EG: Is that right? You still have the boat?

FP: Still have the boat. It's...

EG: How'd you get it over here?

FP: Well, we just shipped it--.

EG: Right on.

FP: --just shipped it over, it's, it's been in two oceans--

EG: It's a Whaler.

FP: --and then, and then, you know, now that, now that I'm the Director of the Division, and I, and I'm not diving for NOAA anymore, I'm back to the same boat--

EG: I love it.

FP: --I'm still out there flipping over the side, still doing the same stuff. So for me, I just, when I feel like I'm missing the part of, you know, my work at the Center that, that I really enjoyed, which was pushing the, pushing the envelope on the frontier, you know, moving us into a new place, I just have to remind myself that it didn't start there. It started way before that and I've circled back to it.

EG: Very cool.

FP: So I still go home on the weekends and now it's my, my 14 year old boy and I flipping over the side doing it. And so I, that's how I, that's how I rationalize it and that's how I'm able to, to basically stay enthusiastic about it. I hope we don't lose the submarine. The submarine is still in the picture, I still get to go out, I'm going out with Sylvia Earle this weekend, you know.

EG: Wow.

FP: She called me on the phone and asked me to go out. And then in September I have two more dives that I want to go pick up some instruments that I put down.

EG: Terrific.

FP: So, you know, it's, it's fun, exciting, insightful, you know, and it's a privilege to do it, it really is a privilege to do it. So.

EG: Terrific. There may be a segue there toward the final question about the future; where you would like to see things go.

FP: Well, yeah...

EG: It sounds like there's two, two angles here. You've got a son now who's getting in the water.

FP: Yeah.

EG: And you've, you've got a career that's been really fulfilling and--

FP: Yeah.

EG: --where do you, where do you hope things go?

FP: I have no idea if my son is going to be interested into going into marine science. My Dad certainly didn't push me. He showed, he saw that I had an interest and he, you know, he tried to foster that wherever he could and so I would do the same if, you know,

my son, Scott, had an interest I would, I would encourage him. I remember when I was the, a young child, that when we'd go out on the boat, I would get seasick. My Dad certainly got seasick and I see that my son is getting seasick. And right now he's, he's looking at, going out and working in the ocean, being seasick as being kind of a non-starter.

But all the times at sea, all the years at sea and everything, I have been seasick plenty and it's really not a question about whether your seasick, it's a question of whether you're disabled by it. And I think that, you know, that, that's something he'll have to decide for himself. And, you know, in the end, it's kind of, I hope that he sees that an adventure, you know, he finds an adventure in something that he wants to do and he goes and does it, whatever that is.

As far as the organization by itself, you know, where it's going, we really have, I'm amazed at the changes that I've seen in the last thirty-five years. I've only been with NMFS for thirty years but starting at the University of Hawaii and being involved with the scientists, you know, the academic, I don't want to call it ivory tower, but the academic pursuit of science was dominant. There were, there were no applied scientists at the University of Hawaii other than my Dad who had come down and changed the model because he was interested in fisheries. And now, you can't find anybody over there who isn't interested in applied science. And in fact I, many would argue that there'll be no money for science that isn't applied science. And so that's, that's been a big, you know, a big change.

We've moved from experts, there were personalities, experts, to a community approach, you know, they, the idea of this, you know, it used to be, you'd get your Ph.D. and you were kind of a world authority in something. That's, that's not so much the case anymore. It really is kind of turning into a, to a community. This idea of citizen science, right? Where, where you get your data through, you know, large numbers of observations from people on their cell phones, and bringing it in.

EG: How do you feel about that, do you think that it could...

FP: Well, you know, I think that it's one of those things that I hear people talk about it but I'm still waiting to see, you know, how, how it plays out. It, it may be a very good way to collect information. At the same time, it may be a fad, you know. You just have to wait and see. I'm trying to keep an open mind on it, I know that I'm guilty of the way things have been done is probably, is probably hard-wired into my brain. I'm trying to, I'm trying to, to be open to the new way of doing things in the future.

EG: Me too. I struggle with it a bit. I, you care about the validity of the data--

FP: Right, exactly, and...

EG: --but maybe it's...

FP: Well, you know, you, you don't know what it is. Maybe it's the only way you can get information on a topic, and so...

EG: Perhaps if done properly, yeah.

FP: Well, you know, in some respects... A big part of it is where the emphasis is. I worry a little bit that the, there was a time in the '70s and the '60s where the science was really well-regarded. Being a scientist was something that, you know, that if you, if you spoke as one, I mean, maybe we've brought it on ourselves. Rarely do we introduce ourselves as Dr. So-and-so; we usually all have our Ph.D.s, but we don't say anything about them. Maybe, maybe we've created a situation where, you know, we, we haven't made it the, the level of respect that it was in the past. But I, you know, I think it's more than that. I think that there's just a, if you look at, you know, societally, the way they're looking at it, it's regarded with suspicion.

And, you know, if you, you see I was motivated into it through media, among other things, because of adventure, but if you look at, if you look at popular, popular movies and television, scientists aren't necessarily great guys, you know. They often come off as the bad guy. Somebody once said, if you look at how often a scientist gets killed in a, in a show, it's more often than gunfighters and, uh, and aliens or villains or something. I don't know, I heard something like that.

But we're also moving to kind of a, from a place where science is about understanding; it can't be just about understanding. It's moving to recovery, okay, you've got to have action, you've got to take action, so. I mean, we definitely saw that with the monk seal thing. They didn't know what was going on for monk seals. They reassigned me. I basically did, you know, eight years of work, we got some insight as to why it is that we're not seeing the neat and tidy answers by the management actions that had been taken, that there are real environmental and ecosystem issues that, that we have to take into account. But now we're at a different place, okay? So suddenly it's not about that, it's about recovering that population. And recovering that population may have more to do with dealing with the people than dealing with the animals. And so yes, you can do some things on that, but dealing with the people and their mindsets about the animals becomes a bigger role. So if you look at the seal program that we have right now, or even the monk seal recovery team that we have right now, they are all people-focused. They are all looking at how they deal with the community. Prior, it was all science in the sense that, that it was about the animals, what they're eating, where they're going, and then what the population level was. So it's a different type of science--

EG: Outreach.

FP: --the science has changed. Yeah. Well, it's more than just the outreach, it's basically trying to understand, you know, why people are actually thinking the way they do, and, um, but outreach is a good point. Science for a long time was about publication; if you're published. And I, I still feel like that's a, that's a cornerstone of what we are. I feel like if, if you rip it apart, knock everything down, that the publication is the means by which we bring closure to any one of our investigations and that it can be followed through time.

But public outreach is becoming very important. I mean, it's, right now you don't have anybody with their grants or anything that don't talk about public outreach and seeing the relevance. I think that, I routinely hear, you know, how many internet hits and

downloads and likes and tweets, as a metric for what the success is. I'm still having a hard time knowing what that means. I, I don't know. But that, that is the future. And that's, that's, you know, that's something that's happening.

And then finally, you know, we started, it was all about fisheries. Now it's moved to be all about protection and trying to figure out how to, how to... And I'm talking about the U.S. Pacific Islands here, primarily, when I say fisheries, you know, we had some fisheries operating, and actually might have even in the '70s was some fisheries development...

EG: Development, absolutely.

FP: Right. So now, we're not talking about that anymore, we moved away from even, we have our fisheries stewardship but we've dialed down some of our fisheries. We've closed a lot of areas. The pelagic fishery is the big fishery, you know, it's way offshore, so it's as much international as it is national. And, you know, it's recovering our protected species. It's keeping, keeping our ecosystems intact, so with these changes, all these things that we just talked about, science is going to have, science in the Pacific Islands is going to need to adapt to these societal changes. That's what we do, we're supposed to support them, so we're supposed to adapt and, and, you know, I think that the, as we move into the future, I think the tools will change radically. We're already seeing how they're being applied, we have a lot of, lot of permits and a lot of requirements, I mean the fact that the *Okeanus Explorer* is out there collecting and it can collect two coral samples, or two biological samples and two rock samples on a dive, so that, and then you have all the scientists, you know, looking through the TV on it and calling in, they're having to decide where those samples should be taken. And it's not like you can wait till the end of the dive and say all right, those are the best ones. You have to decide on the fly as to how it goes. So we're applying a lot of, a lot of limitations on ourselves and our process. And it'll be interesting to see how the, that progresses in the next fifteen, twenty years. Because it is so different than it was thirty years ago. But I think I'm going to be here for another ten years, so I'll at least get a sense to see how the transition is. The monument's been big for us, everything's changed with the monuments.

EG: Yeah we should probably mention that the Papahānaumokuākea Reserve is under review now for major expansion.

FP: Yup, that's right, and in fact that, that's going to be, there's a hearing on Monday and they're going to have the public come in and have conversations about that. And it's... You know, I, I guess I... I was always supportive of having, you know, some kind of MPAs [marine protected area] in place. But the Pacific Islands is faced with an interesting situation here where basically, just about all the waters of the Pacific Islands are falling under some form of MPA monitoring, um, monument, and when you think about it, and then you look at the rest of the U.S. coastline, that doesn't occur. So it is a real challenge for the U.S. Pacific Islands to, you know, they're going to expand this, uh, this monument out to the EEZ, that's the plan, right, so then basically the impact is going to be primarily to probably the pelagic fishers that might intercept with that. And I heard a number of 10% as to the current fishery of the last year or whatever was of where it's at. You

know, who knows, you know, who knows what that impact's going to be. It's, it's interesting. So...

EG: Do you feel like we understand those waters enough to be able to expand so radically?

FP: Well, I keep reminding myself that I'm not a manager.

EG: Right.

FP: My job is to just basically answer the questions that people want. And I think that one of the challenges that we have in the science game now, and it's really, it really is a bit of a challenge because I don't know that scientists have the same respect, I've said that already, the same respect that they had in the past. It used to be that if you brought a scientist in and they gave you the information that, that would be the state of knowledge. But that's not necessarily the case anymore and so we have lots of scientists from different groups putting together what I will say are cases for, or arguments for any particular action. And it's, it becomes, it becomes a challenge, you know, when, when management has to sit there and look at those different arguments. I think that the, our job is to basically look at it and say, "okay, is there, is there merit in that argument." And unfortunately, you know, it doesn't go through any kind of filter. They get put out there and then what are people who make decisions supposed to do when they have these, these things that are maybe a spin on the same topic in different ways, and they're supposed to figure that out. Sometimes we don't know the answer. Sometimes we do and then the question is whether, you know, I sometimes think the decision gets made irrespective of the information. I don't think it really matters at that point. And so that's important for us is to realize that when that happens, we're here, we're available, we can provide the information if they decide that they want to use it.

EG: There are multiple decision layers.

FP: Absolutely, yeah. And I am grateful that I don't have to, to engage in that too much. I, I do with the Fishery Management Council. I do with the Regional Office, we provide the information, but we always just provide the information and then leave it, leave it to them to make the decision--

EG: Separation of... yeah...

FP: --and I do my best to, to not pass judgment on the decisions that they make, you know, it's, it's a tough job.

EG: It is.

FP: It's definitely a tough job and, and for me, I used to, I guess when I started in the National Marine Fisheries Service, I had a real hard time with us being kind of in commerce between the fisheries and between, you know, Fish and Wildlife Service and trying to be this entity that does both fisheries and does protected species. And you hear the, you hear that, that lament from a lot of people in the past. But the reality is, is that it's just, the fact that we have to do both and the fact that we have to sit there and

basically provide that information, I've really gotten to respect the job much, much more than I, when I came in, I was really result-oriented and I said we need to have this or we need to have that. But having a group that basically has to consider it all, and it's important to realize that those divisions occur within National Marine Fisheries Service, they occur, you can see them everywhere. They, and, and having a place, because if we weren't forced to be in the same building and have to interact in the same meetings, can you imagine what it would be like? The fact that we have to be there and we have to exchange that information makes us uniquely qualified to do stuff, uniquely capable of being able to address things. And, and it takes time to actually get your head wrapped around that. Because what you see is things that don't work, and it, it drives you nuts. But it does work. It's protracted, long, but it does work.

EG: Excellent. Thank you very much, Frank.

FP: Yup.

EG: It's a wonderful interview.

FP: Okay. I enjoy talking about this stuff, so, I'm just happy to be on the list.

EG: Great. I may call you back for some follow-up.

FP: Yeah, no, that's fine. When is your due date?

EG: Uh, August 15 for these to be done...

FP: Oh wow, that's pretty good.

EG: Yeah.

FP: I really think you need to get a hold of Mike Seki, pin him down. I think that, uh, you know, he has always had an interest, if he can get, if he can bring people in, if he can bring people back in for the Honolulu Lab, you know, that, that was just a very different experience from what this is. This is a \$330 million dollar facility, sitting on Ford Island, two piers, with as many as three ships tying up against it, sea water facility, you know, it's, it's huge. It used to be a 1940s or '50s concrete two-story building in the UH campus and then Kewalho--

EG: Kewalho

FP: --with its, its feral cats and everything else that was going on down there. And then the *Cromwell* which was, you know, 170 foot rolling, it was half submarine from what I could see, because it was almost under water as much as it was above water, it was going through waves and everything. Very, very different. Typewriters, I came in there were no computers, there were typewriters.

EG: Mimeo machines.

FP: Yes, yes, the overheads, and, you know, we just, we made such a huge change as we came through it to, to where we are now and JIMAR [Joint Institute for Marine and Atmospheric Research], you know, the whole new second half of the lab that exists, that's now University, you know, contractors, cooperative institutes. So, very, very different. Very different environment and for me, when I took the job as a biological aide, GS3, I was here for about two weeks and I said, "I'm going to be here for three months. And I'm going to leave." And this year I get my thirty year pin.

EG: Wow. Well, congratulations.

FP: So I've got to stop saying what's, what's going to be, because I'm not a very judge of it. So.

EG: Well, it's been a great career. Thank you, Frank

FP: Yup.