

Dr. Larry McKinney

Interviewed by Dr. Jen Corrinne Brown

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Transcribed by Maxwell McClure

**[Jen Brown]:** Yeah, okay, it is December 18th. This is Jen Brown and I'm here with Dr. Larry McKinney to finish up part two of his oral history. And for the tape, do I have your permission to record again today?

**[LM]:** Yes, you have my permission to record. This is Larry McKinney.

**[JB]:** Okay, thanks, so yesterday we talked a lot about some of the projects that you worked on at Parks and Wildlife. Was there anything else that you wanted to add, or that you forgot about, or that you wanted to get on the historical record?

**[LM]:** There was a couple that I was thinking about at the end. One was dealing with menhaden, which was one of the last issues that I dealt with at Parks and Wildlife. That's a fisheries thing, so I thought you might be interested in it. And the other was just kind of the end of that water discussion and something had happened. What we were talking about is that I put this program together that was to develop the inflows for all the bays and estuaries, and we produced that document over a long period of time, almost eight or ten years, I think. And when we started putting out the recommendations of how much water would be required to protect them, obviously it started getting a lot of attention from what I referred to as the "water hustle community," which is those people that build dams, often where they were not needed but they made a lot of money doing so—there's a book called *Cadillac Desert* and that is the subject, in part, of that book. There was, maybe even still is a community out there that takes advantage of Texas water shortages, they build a lot of water projects with teams of engineers and lawyers in some cases, not saying all and not only in Texas necessarily, that would find places to build reservoirs and it was how they made money even though the reservoir may or may not be needed. They convinced the local folks to go put in taxing entities and build this reservoir for economic future and they made a lot of money off of it. But that's in *Cadillac Desert*. Basically, anyone who wanted to build reservoirs in Texas after our inflow recommendations came through knew that they would have to deal with us because we would want to set aside a significant amount of water in many cases, millions of acre feet of water to pay for the project. If that water was set aside for the environment they couldn't access and then sell and use that water to justify the project. So, they were always watching what we were doing and as soon as the recommendations came out, they started fighting them. But this one particular instance that really brought it all to head was dealing with the San Antonio Bay, and it goes back to my old days of working with whooping cranes. Whooping cranes were living on the shores of San Antonio Bay, but we were developing the recommendations for inflows for San Antonio Bay, and there was a small conservation organization called the San Marcos River Foundation or SMRF as it became known. And they knew we were developing inflow numbers on their own and they came and talked to me one day and said they were interested in applying for a permit. They had reviewed the legal proceedings and it was clear that it was allowable for them to apply

for a water permit to not build a reservoir but simply to help take the water and dedicate it to San Antonio Bay. But they need to know how much water they should include in their permit, and we had those numbers and we had the science to back it up. As a public entity we provided those numbers to them. I even brokered a meeting with the head of the Guadalupe-Blanco River Authority, Bill West, who was the director then. I brought them together at a restaurant with SMRF because I said, "You need to be above board on what you're doing because the state water models actually show that the water is not there. And indeed, the West said, "Well, the water is not there. You can apply for a permit if you want to do it, but it's an empty exercise." And so, the SMRF folks said, "No, we want to do it anyway just so we can have it to prove that you can set aside water for the environment. As I recall the total water needed for the environment was for like 1.4 million acre feet of water. SMRF got an application together. They hired attorneys. They applied for that water permit and got it in line. It was officially filed and about that same time, the state Water Development Board, who made the estimations in how much water was available. They ran models to demonstrate how much water was in a river that could be permitted. And the models that they had been using were twenty or thirty years old, and so it was time for them to revise them, and they did. And these were official results. I mean, this is what guides water development in the state of Texas when these numbers come out. And lo and behold, their new models showed that there was almost one and a half million acre feet of water available in the Guadalupe River that was not there before and according to "first in line, first in time" permitting process, the SMRF people already had a permit in, they were going to get this water. They were, you know, in the right place at the right time with the right numbers. And the whole water world exploded because, obviously, none of the water development communities wanted to lose kind of water to the environment and set that kind of precedent. But there was nothing they could do about it. They took SMRF to court and SMRF won because these are the rules. I mean, they were playing by the rules that had been set up. What it boiled down to, long story short, is they started down the road of getting their permit and it finally, everything finally were exposed. The water hustle communities real agenda were exposed Their protestations that they were environmental organizations were shown false for the most part because they went to the legislature to kill this possibility. The next session of the legislature was coming up the next year and basically strong-armed a bill through that disallowed water permits for environmental purposes. And the whole point of it was to—and it was very specific no one would be allowed to acquire water for the environment through these rules. Although, you shouldn't have been able to do this in the legislature the bill was retro-active in a sense. They usually don't do things like this, but they did for this. So, they were making that point, and I was really upset about it in one sense because it was clear we could not win even playing by the rules, they would just change them. The water community was attacking me directly as result of our putting them into a position they could not hide behind and they were also hard on that program. I was talking to our then commission chair Joseph Fitzsimmons, complaining about it, and he was kind of smiling about it. And I said, "Well, I'm upset and you are you smiling about all of this stuff, why is that?" And he said, "Larry, what you need to understand," he said, "these people are not complaining about your science. They're not getting after you about your science. They just don't like the answer." And (laughter) on thinking about it, he was right. That's what it was all about, and so it just made the point on the water side of things that this was a big political game, and it was a long-term game, and it's really important that you have to have strong advocates and the science, but even then, politics does play a role. And so that was our lesson. It was a good lesson going forward, but it made it more difficult. I realized we had to have a political leader to

make this work. The opportunity came about thanks to Bob Bullock, Lieutenant Governor Bob Bullock, probably the last true statesmen in the State of Texas, a politician that could really think on a big scale into the future as a whole cloth not just a special interest and not worry about who's going to vote for them next. Story goes that, "a politician's future only goes as far as the next election." Well, he was one of those few types of people that thought well beyond that. He became very interested in the water, making sure that Texas had water, not just environment but for everything. It was a heady process I was lucky to be part of it. He asked me to be part of his team, and I wrote the environmental parts of Senate Bill One, Two, and Three, and also Paul Montagna at HRI before he was with HRI worked on this thing as well and he was a big player in it. Without him a lot of what we did secure for the environment would not have been possible. He was the only biologist and everyone else was an engineer. So, we got a process in to make sure that environmental water was set aside before the permitting process. And that's in effect now, and it does work, and so we did get the problem more or less solved or at least on a good path, but that was a really difficult time. That helped us put a bad time when the legislature in the past when basically said, "We're not going to set aside environmental water." Fortunately for us and Texas, Bob Bullock did.

[8:40]

**[JB]:** And what years were this and the senate bill—

**[LM]:** —Well, let's see, SMRF, that was mid-1990s, that period of time.

**[JB]:** Okay, yeah.

**[LM]:** Anyway, that was that one. The other one was a menhaden one, another controversial issue. Menhaden are a filter feeding fish that they form huge schools, millions and millions of filter feeding fish. I've had the opportunity when I've been in the Gulf on different projects to actually dive in the middle of a menhaden school. There was a time I was doing some work between two oil and gas platforms. I was drifting between the platforms collecting data. The water was three or four hundred feet deep and I was maintaining a depth of probably about sixty feet trying to do that and collecting data in a particular water column. And so, we had the drift set up with the current and I had an indicator float above me so the boats could keep track of me. My whole goal was to hold that depth and take that data, and as I was drifting out over the middle of the ocean, a giant school of menhaden came through, millions of menhaden came right through me, came right over me. Of course, they gave me some distance around me. They went around me on all sides, top and bottom., and it was, like, I guess the best thing I can call it is like being inside a silver ball, because they're silver fish, and the sun was shining in, and so they were very reflectant, and so, it was like being inside a disco ball about the size of a basketball gym because they cleared that space around me. They just kept going. It was very disorienting, but it took them three or four minutes for that school to get by me, and so there were thousands of menhaden in it and that was just one school. But anyway, that's a side-bar story. But they're very important as a forage fish, but also, there's a huge industry, a big netting industry, that use airplanes and big ships to go after them. They'll find these schools from the air, surround them, and collect up the entire school, and often there will be dolphins, turtles, redfish, and all other kinds of fish mixed in there, and most of those are killed or lost and it's a big mortality issue at

one time. They control it better now, but then it was pretty bad. And basically, they used the menhaden to produce omega-3 oils, that's one thing they get out of them. Mostly it's dog food and food for salmon and aquaculture and things like that. But menhaden are fundamental forage fish for all kinds of sport fish, so, they have huge economic impact on that kind of industry and if they're not there, of course, that depresses the population of recreational species. The biggest menhaden industry is on the East Coast, but there is a big industry in the Gulf around Louisiana, and while we were keeping an eye on the Gulf I was also watching and seeing what was happening to industry on the East Coast. Chesapeake Bay is the main place for this, and they were decimating the population because they were such an efficient fishery. It was clear to many of us that the menhaden fishery itself, the whole industry, was going to be looking for a new place to come once they depleted all the menhaden on the East Coast, and the Gulf and the Mississippi River, off the Mississippi River was the obvious place. I tried but could not get the federal agencies or Gulf States Fisheries Commission to do anything about it because they were very oriented towards commercial fisheries and to be fair, they had to balance all the Gulf states interests. So, I started looking, "Well, what could I do?" I decided that since Texas has an extended coastal zone out beyond the normal three-mile limits, we control out the nine-mile limits, I convinced the commission that we should limit the menhaden fishery in Texas waters. I said, "We're not going to eliminate it. I'm not going to eliminate an industry because that would set off a lot of alarms. I said, "I want to make sure the industry can take no more menhaden than they are taking right now. So, if they try to come in and take more than their historic average, they can't do it. So, I won't hurt the industry, but I'm not going to let it grow in Texas because we need to reserve those menhaden for redfish and other gamefish that are economically important to our state, even the Gulf." And so, the fight got going. That was one of the times that I had two different legislators tell me that if I didn't drop that rule, I would be fired. So, it got really heated. The industry got real nasty. They hired a lobby group. They came in and basically tried to label me as a communist, and they went on record in a hearing doing that, and they got real serious about it. What they didn't know at the time though is that the chair of the commission was a gentleman named Peter Holt of the Caterpillar family fame, and Peter, he was very practical, very straightforward fellow, and very conservation-oriented. It just so happened he knew he had dealings with a particular company that dominated the menhaden industry and knew it well and was not overly impressed with what they were doing. And he actually came to me because he was getting the same kind of pressure, really hard pressure, and he just came, says, "Larry, don't worry about it. You're covered. You do the science and if you can make the case in front of the commission, we'll back you up and do it." This is another one of these times where my commission, the political arm of the agency, because they were conservation-oriented and didn't have to worry about people who acted like this and tried to use strong-arm tactics, they gave me the cover and Texas went on and capped that industry in our state waters. We're the only state that has limited it. Florida has tried to do it but I am not sure they were successful, but we now have protected our population and in fact the menhaden fishery has begun to increase in the gulf because of those very reasons. Texas waters are a kind of refuge. So, that was one of the last things I got done before I retired from Parks and Wildlife and I put a little checkmark by that one that one because that's something that will have some real long-term impact. So, that was the story.

[14:52]

[JB]: Yeah, it's good to have success stories in this.

[LM]: Yeah, I wanted to kind of balance off that really kind of downer with the water side of things. You know, you lose some, you win some, and your goal is to keep the winning numbers as high as you can. But you have to recognize, you will lose some in this game. You're not going to win them all.

[JB]: Um-hm, and some of these issues you brought over to Harte right, of freshwater inflow—

[LM]: —Yeah, this idea of protecting forage fish was a big one. When chaired the Recreational Fisheries Commission, that was one of the items that I got put in there as a recommendation for national consideration, to deal with fish like menhaden.

[JB]: Nice, okay, well let's shift over to your time at the Harte Research Institute—

[LM]: —sure-

[JB]: —So, can you tell me how you got the job, why you were interested, that sort of thing?

[LM]: Oh, okay, well, like I said, I had not actually planned to do this. I was quite contented at Parks and Wildlife, although after twenty-three years there I was thinking about that I probably should think about retiring. I had been the head of Coastal Fisheries for almost ten years at that time and I do think it's important that leadership change on a regular basis and for some reason ten years has always been in my cycle and that was about that time, it's time to change. And I was thinking about doing that as we were pursuing the shrimp buyback program that we talked about, and I was contacted by Will Harte, which is one of Ed Harte's sons, and Will and Ed were real interested in the buyback program. They liked the concept and they wanted to lead an effort to bring in private money to help us do this project, and I thought that was wonderful and they did exactly that. They brought a significant amount of private dollars to actually add to the license buyback. So, Will and I established a relationship from that because of his interest in that program. And sometime later, out of the blue, he contacted me about HRI. I was very much aware of the Harte Research Institute, the funding that Ed had set aside, and I was very good friends with Wes Tunnell. He and I were in graduate school together, so it was very exciting to see them start the institute up and get it going. So, I was following it really closely, and Will came to me and said, "You know, we want to have someone directing Harte as its first science director that really thinks like we do. And we like what you did with that shrimp buyback program and how you come at things. Would you think about coming over and taking what you've learned at Parks and Wildlife and helping us build an institute that considers those types of things?" And so after some back and forth I started thinking about it and taking with Ed and looking at all the scientists that were already here. There were a number of them here, Paul Montagna and Rich McLaughlin, Jim Gibeaut for example, and so I began to convince myself, "So, you know this could be a wonderful legacy." I mean, I've spent twenty-three years learning a lot of tough lessons here at Parks and Wildlife of how to solve problems and how to deal with resource issues and what I thought was a very effective way. As I said, we had some wins and losses, but I thought the approach was a good one and so this would be an opportunity to take all those things that I had learned after twenty-three years or so and maybe pass them on and to

bring them into kind of an academic setting and help students become better at this type of thing and also have an institute that could really take this on, be very focused. So that's really what was my final decision to apply for the position with the idea that HRI was basically organized around the very same ideals that I had come to recognize as, you know, particularly effective in taking science and solving problems to the benefit of the environment and so that's what I did.

[19:00]

**[JB]:** And so, when you started, can you tell me about your goals and kind of deciding on what projects and what focus and what science you wanted to conduct?

**[LM]:** Yeah, part of it of course had to do with Ed whom I unfortunately I didn't know for as long as I would have liked. I mean, unfortunately he passed before I could know him well, but I knew him a bit. Of course, Will I did know well, and Will was very close with his dad, and so I knew enough through that and the conversations with Ed that I felt I knew how to organize HRI to make that a reality, and Ed always had simple guidance and how he approached things. It was your job to make it happen. He basically made the point, "If you're going to do something, do it really well." I can hear my father saying the same thing. And that concept or idea came down to a little trope which we ascribed to Ed being that, "All he wanted us to do was make a difference." And that was how we came at it. I liked that simplicity. The institute was also very much focused on problem solving, a very practical application of science and that was certainly what I was interested in. And a little sidebar issue being that Ed was very internationalist. He really felt it was important that the Gulf of Mexico was not just a U.S. water. It was Cuba and Mexico, and of course I had spent a good part of my dissertation research in Mexico. I had not gone to Cuba because of the difficulties then, but I was all over the Caribbean, so I really had an appreciation for that perspective, as well. So, all those things linked together, and HRI had a wonderful advisory committee led by Sylvia Earle, and she had put together some very, I mean, top-notch scientists and others, not just scientists, but broad thinkers, and when they designed HRI, they had this concept of a trans-disciplinary body. They didn't want an institute that just had biologists and chemists and geologists. That was fine, but there were a lot of marine science institutes like that. The one across the bay, the University of Texas Marine Science Institute, it's the oldest in the state, wonderful institute, great scientists, but, you know, very focused on the physical sciences. And Ed recognized as I did that if you're going to solve problems with science, you better understand people. And in my overused and old trope repeatedly say that, people are part of the environment, both problems and solutions. So, you have to think about that. And so that advisory committee worked under a similar concept, they like me understood that how important that was to having an effective institution. And so, they wanted a chair in economics and a chair in marine policy and law. In fact, the very first chair, Richard McLaughlin, who was hired here, is an attorney and an expert in marine policy and law. So, they got that idea, so that resonated really well with me, and that was one of the basic concepts that they organized the institute around. And they not only did it in the chair designation, they designed the entire building that way. The HRI building, with an open concept with the idea of chairs would have offices at opposite ends of galleries and the students would be in between. A graduate student that was an economist would be sitting next to a graduate student that might be a biologist or a geologist, and so the idea of being in one space to build that interaction—because there's many institutions now who have taken this up by the way. When they were designing this

back after 2000, that was twenty years ago, no one was thinking about this much. So, it was very unique, but others have now recognized this and so they are, they have these transdisciplinary institutes, but for the most part, it's in the cyberspace. They're not actually in the same building. They're not physically together. And where we were very lucky here in the original organization is that the chairs, our original chairs, Paul Montagna, Jim Gibeaut and Richard McLaughlin, and all the others, they were scientists who were very interested in this very concept too. They were good scientists, excellent scientists on their own but they were interested in taking their science and solving problems. And so, they had that attitude because this was not going to be an institute for basic scientist who just want to do their science, write their papers, and then go onto the next issue. They wanted to apply that science. So they were there, and they're very collegial. And that's where I've been lucky both in Parks and Wildlife and here is that, you may not believe this, but, you know, some faculty members, some researchers can be quite prima-donnas, and I know it's hard to believe (laughing) and it has not been the case at HRI

[24:01]

[JB]: —No, no (laughs)—

[LM]: —But in academia, some faculty can be that. And there's a few I know that I wonder how they can get in the door their heads are so big. I don't know how they get through the door (Brown laughs). Any rate, I'm joking, but they typically are very focused on their own issues and that's why they're probably successful because they're laser-focused and their thing. But we were very fortunate in this group here that I came together with, Dr. Yoskowitz, who is now the new director, and Gibeaut, and Greg Stunz, they have really worked well together ever since I've been here. They support one another and their students work together, so it's been a very collaborative, transdisciplinary yes, but it's very collaborative. So, that has been a secret that many other institutes may have not been able to claim. So, we were fortunate in the chairs that were brought together. That's that one basic transdisciplinary way. That was the important feature of Parks and Wildlife and HRI, that made it successful. The other area that has been unique about HRI is, I've talked about where we are very focused on the world around us. And what I've come to appreciate about academia, of course, I was in academia before I was in Parks and Wildlife for about ten years and then twenty years there and been here for almost twelve, and so they had that opportunity to kind of compare both, and what I have seen in academia has been a constant pressure to get kind of isolated, and I think it's a real problem for academia. It's one of the reasons that science has begun to lose traction. We talked about that a little bit is that is that in some sense academia has built this protective bubble around itself and has not interacted with the world like it used to, or it should. In one sense a good buffer for a lot of crazy distraction so it's kind of become a separate with academia focused on doing its research, writing its papers, working with the students, and then repeating A cycle where success is measured by the numbers of papers, peer reviewed papers that are written and their impact and those types of things. Now, you need that in academia., I don't want to say that you don't. Some people call that "basic research" or "discovery research," we need that, but you also need scientists that are interacting with the world around them and making those connections, taking science out of the bubble. And that's what HRI is really is focused on is to do that. Of course, I was so concerned about it, I put together a workshop on academia and policy. One of our key researchers a young woman named Dr. Katya Wowk and were particularly interested in this idea and we brought

some of the leading folks in this issue together. Deep thinkers the former director of the National Science Foundation, and Woods Hole, and a whole group of folks international to talk about, “How do we make academia more relevant?” Because we wanted to make sure we did that. And of course, what did we do as academics? We wrote a paper of course (laughs)—

[27:13]

**[JB]:** —You know, I tried to find that paper this morning, but the link wouldn’t work in the library. So, I’ll have to Interlibrary Loan it—

**[LM]:** —I’ll get it to you. It was really a wonderful exercise in just talking about this a constant battle where faculty members still do not get credit for engaging with the community around them. They think they do it all the time, but when academics talk about engagement, they typically talk about committees, internal committees, and professional societies, and all of that. All which you need, but I am talking about outside academia and they get no credit for engaging with those stakeholders, for lack of a better term, people so that’s a part of this problem. If you don’t get credit for it, you can understand why faculty don’t do it. It doesn’t help gain tenure. It doesn’t help gain promotion, so our point was trying to encourage academia leadership to broaden that horizon. I started that conference off with one of my favorite historians, it’s a fellow named Page Smith. You’ve probably never heard of him, Page Smith, but he was an old-time historian, you know, and I read him a lot now, and people like he and Shelby Foote, you may know Shelby Foote—

**[JB]:** —Um-hm, yeah—

**[LM]:** —of course from the Civil War deal and Shelby and Page are the old-time narrative historians. They do history by narrative. Of course, the trend nowadays is more kind of an analytical history, quantitative type things. Those guys they didn’t like that. They thought we lost something in it, and Page had this famous statement that I started this workshop with, and his statement was that “The vast majority of the so-called research turned out in the modern university is essentially worthless. It does not result in any measurable benefit to anybody or anything. It is busywork on a vast almost incomprehensible scale (laughs).” So, I love that statement. And of course, he didn’t care about the statistics, but of course, a statistical historian did and the point is, and I can’t remember who did this work, I’ll have to find the citation, but I have the quotes here, that the fact is that 98 percent of the articles published in arts and humanities are never cited by another researcher. In social sciences, it’s 75 percent are never read once they’re published, and even in what we call the “hard sciences,” the “natural sciences,” 25 percent of those articles are never used either. So, there’s some real evidence even if you’re not a fan of narrative histories, there are some real evidence about impact or the lack of it in much of academia. It is probably not a fair statement but it makes the point and I don’t think Page much cared because he was really like that, making inflammatory statements. Nonetheless, I use it every once in a while, and at meetings when I use that, you hear this kind of shocked silence that I would even say something like that. But anyway, and I guess I like Page because he’s a narrative person, I think of myself more as a naturalist as well. I’m not a partially good quantitative scientist, which probably relates to my dyslexia, which I have pretty severe dyslexia, and I’ve had to try to deal with it all through school. I managed, and I never really had any



professional help with it. Of course, I'm interested in it in, the whole concept. So, I found ways to adapt. So, numbers are particularly hard for me because I switch them up all the time, so I had to be very focused to work on it. So, when I'm writing, I'm doing research I have to be very aware and maybe that's helped me focus because I have to stay razor-focused on issues. And I do pretty good, although I really messed it up about a year ago. The Gulf Fisheries Council was considering allowing the shrimpers to do away with their fish bycatch devices. We talked about turtle bycatch devices. There's also devices to help keep fish out of those nets, particularly red snapper. The bars are much closer and so they take out even more shrimp so that more shrimp are lost, less of fish, and so this has been going on for years, and the shrimp industry was trying to make the case that the snapper fishery was so well-established now that it didn't matter if they took more snapper. They could increase their efficiencies and try to make the case. So, I wrote a pretty, not nasty, but a pretty pointed editorial that was published in several national magazines saying that this shouldn't be allowed, and I had done some calculations about the impact of the numbers of snapper that were being lost, and I flipped a decimal place with the number, I just literally did that. And I always have ways to catch myself, just got to check it and check it, and this one got by me, and it made it appear that their impact was two to four times greater than it really was. Well, it didn't take long for my one of my colleagues on the other side of the issue, I know him quite well, a fellow named Benny Gallaway, we're very good friends, but we have opposite views, and he pointed it out. And so I had to do a retraction, so it was very embarrassing, and I probably hurt the cause—anyway, I'm sorry I got off on a tangent there, but just making the point that I have to be really careful, that type of thing. And that's why I guess I'm more of a naturalist than a quantitative (laughs) biologist because I get myself in trouble. Any rate, where are we? I really got off on a tangent. Sorry about that. We were talking about academia being kind of outside, and that's what HRI tries not to be. And one of the ways we came at it, and this is something, it comes at the heart of HRI and the heart of everything that we've done that I've worked on here, is that we develop what we call this HRI model based on all these experiences in how we come at things. And that's been the heart of what we've done and one of the reasons I've enjoyed working here, and that model, it's kind of the core of what we do and it's really engagement oriented. It basically says, "When we identify problems, you need to engage with those people who are dealing with the problems." Over and over, academics and scientists think they know the problem because they see it from their perspective, but we really don't most of the time. It's the people who are experiencing the problem that really know because they are often living with it. You have to talk with them and see what their problem is and how they see it because it'll give you a whole different perspective, so that's one part of the model. Now once you understand what the problem is and try to solve it, come up with a solution, what we recognize here at the institute, is that often we don't have all the expertise. We've got a lot of expertise, but we don't have all of it. So, you have to have the capability to bring in other people, other expertise, to focus on what the problem is and solve them. So, we engage with our own scientific community, which is important. HRI is really good at this as well. And then the third part of that model, this is where academia often drops off. We were talking earlier about the fact that most academics have no interest in going beyond "solving" the problem and writing the "paper." HRI is focused on taking the science and actually implementing a solution. Most academia stop at that second stage and start the process over again. They put the solution out there. They hope somebody takes it up. Or maybe it just becomes shelf art because no one ever looks at it again. But we actively engage with regulators, with managers, and private industry to actually solve those problems, and that could be

dangerous. That's where you can easily get into this advocacy business or being accused of advocacy. We try to be very careful with that that we're laying out options and we give the best science available and that type of thing, but that's the third part of that model. That's how we try to come at things with our model and no one really does that much or better than HRI. We're one of the few academic organizations that really do engage in that very dangerous third element of our model. One reason is that it is dangerous professionally. And that's where I guess my strength has been and where I think it's important that heads of the institute like HRI have that experience, not just be academic, not just be an agency, but have that mix of experience where you can kind of see both worlds and make sure you kind of keep that balance, and that's why we've been successful. The last element of the HRI model and why it works is credibility. If you're going to do this type of thing, you really have to be credible. Credibility is difficult, as the saying goes: "It's difficult to build credibility, but you can lose it in an instant." Just like I was talking about that shrimp decimal error. We've been really fortunate at HRI in that we have some excellent scientists. I mean, we have two regents professors, those are really rare, Greg Stunz and Paul Montagna. All of our scientists have regional or national reputations. They publish in the highest end journals. I just found out that one of our folks did an analysis, a couple weeks ago, I don't know where this is coming from, but we discovered that Paul Montagna is considered in the top two percent of the world's most influential scientists.

[37:19]

**[JB]:** Oh wow.

**[LM]:** And so, he's the only one from this university that's in that list. So, we do have really bright and well-known people and that helps you carry the day in arguments, that credibility. And the other thing that helps in that regard in the credibility side is that we're actually at a small regional university. If the institute were a part of what we call "the mothership" at College Station, if we were located there, we would just be another cog in the huge machine because they have lots of institutes. Now, we're a pretty big one in one sense, but they have lots of them there. So, we would just be in the mix. But here at this university, we're a much more substantial part of the university. We also have a lot more independence than we might have at College Station and we get greater support from the university than we would ever get in College Station to move forward. So, it allows us a lot of flexibility to do things that would likely never happen otherwise. So, being located at a "smaller" school, is a great advantage not a disadvantage. Some people would consider that because of the prestige thing, bigger is better. But where we operate for the most part is not in the academic world necessarily, we're part of it, but we're trying to work in bigger area and so credibility there is different, a different definition outside of academia. So, I think we've been really effective in building broad credibility. Then there's the international side. But anyway, I'm sorry, I'm rambling again, I'll get back to your question. But those are kind of the three parts of HRI that has made it really work and it's why I've been really engaged all these years and why I am still here. I'm trying to help make that next move forward, and it's been successful for us. When I first came here in 2008, we had about a two million dollar a year budget and we had I think thirty people or something like that, and today our operating budget is twenty-five to twenty-seven million a year and we have anywhere from one hundred fifty to one hundred seventy students and staff at the institute. So, in a ten-year period, we've really grown. In fact, we're at the point where David, Dr. Yoskowitz, the new director, they're

really having to have a discussion, “Do we want to get any bigger? Maybe we’re where we need to be.” You know, we’re adding a few chairs here and there, but do we necessarily want to become this behemoth or can we be at this size, be really agile and effective? Because that’s really his goal and all of our goal. We’re not interested in growth for growth sake. We’ve turned down grants and contracts just because we’re not interested in busywork. We don’t need that. We try to focus on those kind of grants and money and funding opportunities where we can actually solve a particular problem. That’s what we try to focus on. So, we’ve been fortunate enough in that regard because our chairs are so effective. I mean, their success rate on grants is in the twenty percent range, and overall if you’re somewhere close to ten, you’re considered super effective anywhere. But these guys are there. So, they are comfortable in having the funding to support their students and their staff and all that. So, it gives them the luxury of when we’re working together, to focus on really serious problems like fisheries problems that we’re doing and some of these others and really make an impact, and that’s our goal. So even in these hard times, we’re celebrating our twentieth anniversary in the institute, we’re having those thoughts about, “Are we where we need to be?” And just need to hold this and try to be good or can we be effective if we’re larger? It’s a good problem to have, but we’re struggling with it.

[41:19]

**[JB]:** Yeah, and I mean, when you were director, how did you deal with that growth? Because it seems like it creates a lot of problems on kind of the backside of things.

**[LM]:** Well, I thought we needed it. I spent most of my time promoting it because I thought the institute was just not big enough to impactful. We had to be on par with other institutes in other states at a certain level. We had to have a reputation, for example. We didn’t have that when I started here. We were, just getting started. So, I spent probably the first five or six years I was here, actually I was very seldom at the institute. I was traveling two or three times a month, participating in workshops, this or that. And I would encourage our other chairs to do it too just to establish that HRI was a player, that we have things to bring and to build partnerships. People, some folks and even academia don’t realize that when you’re putting out proposals, yes you must have the strong background, you must propose good science, but many have that, and so where you come from, the reputation of the institute of which you are a part can be that deciding factor whether you get that grant or not when all other things are equal. So, we have to be on par with those other highly considered institutes, and so that’s why I spent in my time trying to do is make sure everyone in the Gulf knew we were here even nationally and making sure that we were engaged with them and that type of thing. So, I thought we needed to grow. I have to admit, I did not think we could grow as quickly as we did, I never thought we would be where we are today so quickly and now I have a have concern that we might be getting too large or we don’t want to go any larger. What really put us over the top was the biggest environmental tragedy in this country, or one of them certainly in the Gulf, that being Deepwater Horizon. The institute was in the right place at the right time for this really unfortunate event, and we really made a contribution to addressing those issues. Right before April 2010, I had put together the final set of chairs, the six chairs that I thought would be the core of HRI. Dr. Yoskowitz came on board as an economist. Dr. Stunz came on board in the fisheries side. We already had Dr. Gibeaut in geosciences, Paul Montagna in ecosystem, and Richard McLaughlin in the policy and law and a good cadre of researchers around them that are not chairs but are really good at what they did,

and when Deepwater Horizon struck, I brought all of us together it started to say, “Okay, this is clearly going to be a big issue. We need to think about how we can address these issues to be part of trying to, one, solve this issue, but two, also recover from it.” And we had never done this before, never thought about this, but we started going around the room to see who has had experience in the oil spills. When I was in Parks and Wildlife, I started the oil response program, which started after Exxon Valdez, the Natural Resource Trustee program, became a part of that. So, I was the state’s first Natural Resource Trustee, and I started the entire program for the state about how to respond to oil spills with other agencies. So, I led that with Parks and Wildlife. And so, I had led responses to every oil spill that occurred over that twenty-three years at Parks and Wildlife, so I had all that experience. But Jim Gibeaut had led the shoreline assessment for Exxon Valdez, and Wes Tunnell had been the lead scientist for the Ixtoc Oil Spill, which until that time was the largest oil spill that had occurred in the Gulf of Mexico down in Mexico. And Paul Montagna had been studying oil spills and impacts for years, especially in the deep Gulf. So, we had this incredible array of expertise in oil spills that we never even thought about before Deepwater. So, we laid out a strategy together about where we should be working with our counterparts in federal agencies and other universities to move forward. And so that’s how that kind of launched the institute into a new era for HRI. One of the things that I worked originated directly from the British Petroleum group. BP said, “we’re going to set up a five hundred-million-dollar research program for the Gulf of Mexico and we’re going to turn it over to scientists and it’s going to be independent. And they announced their board, the Gulf of Mexico Research Institute, GoMRI they called it, they announced their ten-person board that was going to oversee the entire Gulf of Mexico five hundred-million-dollar ten-year research program, and there was not a single person from the Gulf of Mexico on that board, and I just blew up. And actually several other people did as well, a fellow who’s head of the Florida Institute of Oceanography Bill Hogarth, Dr. Chris D’Elia, who is the head of LSU’s Marine Science Program and several others, we all kind of independently blew up and we knew one another. So, we got on a call and said, “This is crazy. This is ridiculous.” And so, we formed an organization called the Gulf of Mexico University Research Collaborative, to promote Gulf research capabilities and capacity. It’s still going today, with the whole idea of promoting Gulf science. We knew we had really good scientists here in the Gulf of Mexico and we used that organization to go to Congress and let them know, as well. We all got on planes and we went and talked to our respective congressmen. And at that time, several of our states had very powerful senators. They still do in some cases. And it was incredibly powerful for scientists from all five gulf states’ to come together and support one another. They had not seen that before, and we made our case, and that word got out, got back to BP and others because Congress put the political pressure on them, and they opened up that entire GoMRI program to now include ten members from the Gulf states as well. That program became one of the most effective research programs ever in the Gulf of Mexico. It was a ten-year program and just concluded last year. The research that that group supported has, I mean, we have learned more about the Gulf of Mexico in the last ten years than all the years before. And a big part of that credit goes to how GOMURC helped advance that effort. So, I’m quite proud of that group. I mean, many of our scientists were part of it. Paul Montagna especially. All our scientists had pieces of research in that effort. I didn’t do anything specific there except dealing with the data side of things, but that was our role as an institute. That’s what really got people’s attention about HRI. Dr. Gibeaut set up what was called GRIIDC. We went up to the visit with the people in Alaska who had studied the Exxon Valdez spill to learn some lessons from them: “How do you do the research necessary to follow up on

those spills?” And one of the things they said was a big mistake there is that they did not make sure that all the data and science that was generated from that spill was available. There were millions of dollars spent on research. Much of that data has never seen the light of day. They’re on CDs probably (laughter) or in file cabinets of scientists. So, we convinced GoMRI that they needed to set up an organization or structure that required that all generated by that five hundred million dollars’ worth of research was recorded and available to anyone, and that was the GRIIDC program. And Dr. Gibeaut here at HRI designed that entire program, and he did a wonderful job. It’s now a national model. I’m rambling again, but that’s how HRI’s reputation grew with people like Dr. Gibeaut and Montagna and Dr. Yoskowitz, who was an economist. No one had ever taken an oil spill and cost out a dollar impact from what happens when wetlands were lost. He did that, so things like that. So, our reputation just exploded over that period of time and we’ve continued to build on it.

[49:56]

**[JB]:** A couple of follow-up questions on that: why did the Valdez oil spill not Ixtoc to lead to changes in Texas? And then, in talking about, like, discovering new stuff about the Gulf, what sorts of great discoveries came out of that?

**[LM]:** Okay, so the question being, “Why did we learn things from Exxon Valdez and not Ixtoc?” Because Ixtoc, this was an oil spill that occurred off the Yucatán of Mexico of course, and it was in the seventies, and it was a very similar thing to Deepwater Horizon, although it was in shallower water. The well collapsed and the whole surface of the gulf there started burning and millions of gallons of oil came to the surface, and in this case, that oil, because of currents, came right at Texas. Now Texas was not greatly impacted by Deepwater Horizon, but we were the only ones that got hit by Ixtoc. And there’s pictures of Padre Island National Seashore. The entire beach looked like a two-lane paved road with asphalt, entirely oil. And so, it was difficult. One of the things that I did when I was a part of that studies there is that we recommended that we should close Cedar Bayou because the one thing that acted as a natural barrier for us here in Texas and our estuaries were the islands. They kept the oil from getting back into the bays except through passes. And so we bulldozed closed Cedar Bayou for example, and things like that. But the problem was that that oil spill was in Mexico. PEMEX would not allow a lot of work there, wouldn’t allow anyone close to it much being a sensitive area. Wes Tunnell was trying to do those studies, and so he did start and complete some of those studies and many other studies were funded, but as soon as that well was capped, the funding for those studies were cut off, even in the U.S. And so, very little was ever published. We have all the literature that was published at that spill, but very little was published and not followed up on. So, there were not many lessons that could be learned from that spill because the research just did not happen. On the other hand, Exxon Valdez, it was very well studied, and a lot of information gathered. That’s the answer to that question.

[52:20]

**[JB]:** Okay.

**[LM]:** I can’t remember, what was your other question?

[JB]: Oh, the discoveries in the last ten years.

[LM]: Oh, yeah, just a couple for example, we did not understand how oil, for example, acted a mile under the water. I mean, the Deepwater Horizon occurred in mile-deep water and we were used to oil spills in bays or shallow water or that type of thing. So, the water immediately bubbled to the surface and created slicks. So, all of our responses to oil spills, cleaning them up, mitigating them, was predicated on oil being on the surface of the water and on top of the waves washing into wetlands, or over oyster reefs and things like that. Well, what happened with the oil from Deepwater Horizon, it came out of the bottom of the Gulf much like you would take a can of air freshener, turning on its side, and push the button, and spring that column air freshener straight up. It created underwater plumes, clouds, currents took those clouds and spread them around the deep Gulf. And along the edge of the Gulf, we have a continental slope. We have very productive shallow areas around in the continental margin of the Gulf of Mexico, but then they drop off in a shelf-like structure to the deeps. And so, the currents took that cloud of oil and sent it around the Gulf at a depth near this slope. The Gulf is shaped like a bathtub, so this oil just coated the margins of the continental slopes like a bathtub ring. And we had no way of cleaning up oil that's dispersed into water columns rather than at the surface. So, that was one thing, we had not seen. We now know much more about how the deep Gulf of Mexico is connected to the surface waters and back to the coastal waters. We have a much better understanding of how nutrients move in the Gulf of Mexico, how fish and wildlife move throughout the Gulf of Mexico in currents and those types of things. So, that's some of the things that we learn. You know, so much science was done in understanding the deep fish and invertebrates, we know more about those. We have better understanding of about how the coastal and estuarine waters interact with one another because of studies, those types of things. Of course, there's very specific studies on different fish groups and animal groups. So, all that is there that just hadn't been done before. So, in a combination, it's incredible. I was talking to Dr. Gibeaut about it some time ago, and we were talking about the amount of data that was generated, and I have a little bit to understand about terabytes and things like that from computers. We all kind of hear about it, but I didn't know much about petabytes for example. And so, he was talking about petabytes of data that were part of what we learned about the Gulf and I couldn't put my hands around a petabyte. I didn't know what that meant. It sounded kind of weird. Basically, he said, "Okay Larry, right now in the Gulf in GOMRI and other work related to Deepwater Horizon, we're probably going to generate two to three petabytes of data." And he said, "One petabyte of data, here's what it is. If you took all the books in all the libraries in all the universities in the United States and digitized them, that would be one. So, all the books in all the libraries in all the universities, that's knowledge that's there, we're doubling that." Actually, we don't know what we know right now. There are a lot of things where we have all the data, we have all the studies, so we learn what's in those studies, but no one has yet synthesized all that and taken a look at how they all interact. That's what's going to be going on now. That's what's happening now, and that's the exciting part of discovery science in the Gulf of Mexico. We're now taking advantage of all the research we did in response to this horrible tragedy to actually turn it into something good, I think, and that over the next, you know, ten to twenty years will be the focus of what we do here in the Gulf of Mexico, and that will have implications all around the world. So, from a research and science standpoint, it's really exciting times if we get a chance to do that.

[56:43]

[JB]: Um-hm, yeah—

[LM]: —Or someone gets to do it. I'm not going to do it, but someone's going to get the chance to do it.

[JB]: Right, yeah that's pretty neat. Speaking of around the world, so last time yesterday you talked about being a bio-politician (McKinney laughs). But it seems like at Harte you became a bio-diplomat because of the international science, and can you talk more about that?

[LM]: Yeah, I've really enjoyed that part of it. And it's been challenging in some sense. Ed Harte, who was, you know, a committed internationalist, he loved Mexico. He understood that if we're going to solve problems in the Gulf of Mexico, you had to deal with Mexico and Cuba. In fact, the very first meeting of the HRI's Advisory Committee before I came over when they were starting, they held it in Havana, Cuba. They went there to make that point. I also believe that because, you know, my own experiences of working on my doctoral dissertation and the animals I worked with were clearly in Mexico, and Cuba, the Caribbean, and all that. So, I had a natural tendency toward it. And that was part of the mission that Ed charged us with is, "You're going to deal with international Gulf issues if you want to be successful," so, it was clear that as far as my leadership side of things, one of my obligations was to develop that. And it was really fortunate in that Wes Tunnell, who is really the kind of heart, actually not kind but is the heart and soul of HRI. We called him the "Soul of HRI." It was his visions that had much to do with our international efforts. He was a Fulbright fellow in Mexico and he did a lot of research in Mexico in the years after that fellowship. So, he was committed there as well and had great friends in both Mexico and Cuba, As a Fulbright fellow and that's a very prestigious thing, he did a lot of work in Mexico. So, I started trying to figure out how we build on these relationships. I said, "Well, there's two ways. One, we had to build a relationship with students for the future, but we needed something right now so that we can make those connections." So, I came up with the idea of setting up a chair, an international chair, one in Cuba and one in Mexico, and I talked to the president about that and she was very supportive and I talked to the HRI foundation about what I wanted to do, and they were too in fact. They said, "We'll put money into it." Joe Hornblower, who's the attorney member of the foundation, and Ed himself set aside almost a million and a half dollars to set up a separate Ferguson Fellowship Fund to support international work. So now we have Dr. Nuno Simões, who's at the University of Mexico and Sisal, down in the Yucatán. He has been an international chair for a couple of years, and Patricia González Díaz who is the head of the University of Havana Marine Science Institute, she's the other chair, and so we work with them just as if they were HRI chairs and we do joint research programs and that type of thing. So that has established a really wonderful link at the professional level. Then I tried to think about how to get students involved, I came up with this idea of, "Okay, let's pick students in the U.S., and Mexico, and Cuba, graduate students, primarily doctoral, but it could be master's, and let's bring them together and we'll move this program around the Gulf. We'll meet in Cuba, and Mexico, and the U.S. on a regular basis and we'll bring these students together there and let them interact with local experts and address a particular problem, whatever the host country wanted them to work on, they will do that." The idea being to help these young

doctoral, master's students make connections internationally so that when they got out into the world doing research, they'd be comfortable on an international level. They'd have colleagues that they would already know in Mexico and Cuba and they would be comfortable working in the international scene. Also, they would begin to build a network in each other's countries and they will have not only networks between themselves but with senior existing experts in those countries, so that would help promote collaborative work. It also had one interesting side effect. Our very first workshop we held here in Corpus Christi, and the focus of the workshop was, "Can we build an international network of marine protected areas between Mexico and Cuba and the U.S. that would help all our countries work better to protect and preserve the Gulf of Mexico?" They developed a lot of work in that area and produced a paper about how to do it. Well, a few years later when President Obama came in and improved relationships with Cuba, and subsequently he went to Cuba, one of the things that he wanted to do was to come up with some joint projects or actions. Well, the very first idea that they came up originated from the students that were in the workshop and in the federal government working in NOAA. The idea was an international agreement to create sister marine protected areas between USA and Cuba. They announced that agreement at a scientific meeting in Havana, Cuba that I was at MARCUBA., and at the time, Kathy Sullivan, the former astronaut, and the administrator of NOAA went to Cuba to sign the agreement. And so, I was standing in the hallway after they had done all that, and she came up to me, and I knew her, and vice versa, and she said, "Larry, I just want to let you know that the reason that we're signing this international agreement, the first of its kind ever, is because of the workshop that you organized with your students three years ago." It was a really great feeling. Not only had we been working with students but we actually had a real impact on an international stage. So, it was pretty wonderful.

[1:03:07]

**[JB]:** Um-hm, how did that change when in terms of, like—the U.S. relations with Cuba have been kind of back and forth (both speaking at once), yeah.

**[LM]:** Yeah, the relationship with Cuba have come up and down and under President Trump they have really been more and more difficult to the point now, really, under his last set of executive orders, we really can't work in Cuba right now. We're not going, not for obvious reasons, the pandemic, but even before that. So, we can't work there for now. It's almost impossible. We have always been careful to follow all State Department regulations and guidelines in dealing with Cuba. We do believe in science diplomacy and that all three Gulf countries have to work to protect the Gulf. We keep up communications and all of that, but nothing can be done in person for now. So, it has been incrementally more difficult to do things. We hope that under a new administration that that will change. I mean, obviously, I and others think it's a mistake to isolate Cuba. I think the way you build relationships and change things is engagement and that type of thing, and there's wonderful scientists in Cuba. Of course, we have been going to Cuba for twenty years. We've been working with Cuba from an academic standpoint longer than anyone else and we have more agreements, more relationships than any other university in the United States. I even wrote an op-ed in *Science* to that end to try to make that case. Of course, that hasn't worked, and I hope that the new administration will open that back up so we can reengage in Cuba in a way that we can because science is international. I understand differences in policies and the human rights issues, and those are difficult issues, and



those concerns have to direct things, but the way to make progress and build bridges through “science diplomacy” as I would call it and others have called it, science diplomacy is really important and a valuable tool. If you can keep the doors of science open, that gives you opportunity move forward because it’s a basic tenant that I operate on here at HRI anyway is we try to, you know, we’re not confrontational. We’re not advocates. We try to provide the best science and options and promote going in that direction, and we try hard to find common ground, and that’s our theory. If you can find common ground between groups and stakeholders and others, and build on that, that gives you the opportunity to solve the more difficult problems where you have a basis of trust and a track record of success. If you can build trust and build credibility with each other, then you can take on the tougher problems. And I think that works internationally as well as here that if you can find ways that you can work together, it builds those bridges to solve problems because you’re not talking about another issue. If you’re in your “tribes” as it’s been called these days, if you’re tribal and these types of things, then obviously, all you’re doing is seeing each other as an enemy, not as someone with some common ground. And that’s probably naïve on my part. I’ve always operated under the idea that if you give people the right information, if you give them the information, they will make the right decision. I hold to that belief generally, as a people, I think most people are that way. If they have the right information, they will make the right decision. I think that’s true. I understand. I’m not naïve enough to think that subsets (laughs) of those people are not going to act on their own interests and own agendas. That happens and I get that, but I don’t think I could continue with what I do if I didn’t believe that. I do believe my glass is half full, not half empty. And so, I continue with that belief and I think that it internationally works as well that you need to come at it that way.

[1:06:47]

**[JB]:** Um-hm, so you talked about, you know, you’ve been in this business for fifty years, and what’s changed and what’s stayed the same over that period of time?

**[LM]:** I think certainly the physical environment, obviously things change but it is not so obvious with your immediate surroundings. When I was at Parks and Wildlife, every year I used fly the coast in one of our observation planes. I would fly the entire coast from Brownsville to Sabine. I would lay on the bottom of the plane looking through a big port where the camera was located taking photos looking for change. So one thing I saw that obviously makes sense is that our coastline has steadily gotten far more crowded. We’ve developed more on our coastal margins, right at the edge and that type of thing. So, that kind of change has happened and. That’s probably not what you’re talking about.

**[JB]:** No, just, yeah, part of it, right? Like, what have you seen both in the physical world and then in kind of ideas and culture?

**[LM]:** Yeah, I don’t think people understand how much things have changed. And that’s why I’m looking at old photos from the forties and thirties, even aerial photos and others compared, you can’t imagine how much change has happened in the coastal environment with the building of cities and industry and what it was, and it’s within our lifetime, and man, you can’t imagine beyond that two or three lifetimes. In our lifetimes, things have changed, and because of that change, issues of dealing with environmental issues have become much more complex. When

Parks and Wildlife, before I got to Parks and Wildlife during my time, in the thirties, and forties, even fifties, the main function of a state agency like Parks and Wildlife was to exploit the fisheries as much as possible. They were so abundant. Shrimps, and crabs, and oysters, and others were so abundant that you wanted to make maximum use of them, and so the focus on getting as much out as you can. Today, it's just the opposite. We're overexploiting and people are everywhere. So, solutions to problems are far more complex. As we've talked about all along, science may not be easy, but it's straightforward. You can figure things out and you can actually come up with solutions, science based solutions, that are quite eloquent. But you often can't use those solutions because of the potential negative impact on people that are all around us. So, I think that has been an issue. I do think, as we've discussed, that science has lost its sway if you will as the core of problem-solving and it's become far more ideological. As I tell people, I don't know where I stole this quote from, but I use it: "Everyone is entitled to their own opinions but not their own facts." I know it doesn't stop them from acting on all those opinions but it is the best retort I can find. And so, what we have seen more and more is decisions are agenda-driven, not fact driven and individuals trying to submerge or dismiss scientific basis for decisions and then having to live with the results, complaining they don't understand what went wrong. And I think part of where science has failed is not living up to what it should be doing is keeping itself relevant because at one time, scientists were held in great esteem. I think they are in a sense, but not to the degree where we were. So, we have to regain that and interesting enough, I think this pandemic may help that because of all things, the tremendous success we've had in generating these vaccines. I think it has shown the power of science and so some things like that I think will help kind of reestablish it. But we sit on a balance I think from the environmental side of this in just that it's much more difficult to make an argument for protecting the environment for making sure that the environment are part of the decisions in light of all pressures we have from human issues that seem overwhelming, poverty and illiteracy and disease, and all the things that are so important to us as people, it's difficult to not put environmental issues off to the future. Unfortunately, those of us who have long-term concerns about our environment, we worry about tipping points that might pass unnoticed to the point that you reach a point you can't come back without even knowing it. I think we are not there yet. We're trying to demonstrate that with Deepwater Horizon. We have eighteen or so billion dollars to work with. We've never had money like this for the environment before, so many of us were trying to focus as hard as we can on making sure that money has real impact to show that if you invest in the environment to restore it, it does produce benefits, not only economic, but health and human wellbeing not just fish. It's really important. This is where we live. I'm rambling a little bit, but it is much more complex today than it ever has been and we, society, seems so blind to that at times. Now like I said, my glass I try to keep it half full, and one thing that helps do that are the students that are coming out of HRI these days and others, not just HRI but students in general, when I was in Parks and Wildlife, I kind of lost touch with students and I missed that greatly. And that's the thing I've enjoyed more here at HRI than anything else really is the interaction with these young students, and they're brilliant. I couldn't even get into graduate school these days when I compare myself to what these students, what they know, and how they act, and the perspective that they have. They are so socially aware compared to what I was when I was their age. They have so many more tools at their hands to do things and that type of thing. So, I feel really good about the young people coming forward who will have to deal with much more complex issues that I ever thought possible. I think the capacity of our students

to deal with these issues are growing with the severity of the problems and I feel some optimism because of that.

[1:13:51]

**[JB]:** Nice, okay, one of the things that we had talked about yesterday that I wanted to have you kind of discuss and talk about is oysters, and Galveston Bay, and not only the destructive dredging but then also the destructive oyster harvests. Can you tell me more about how you got involved in that and then some of the initiatives at HRI to deal with it?

**[LM]:** The oyster fishery is the last of the destructive fisheries that I want to reinvent. We talked about dealing with shrimp and commercial fishermen and those types of things. This is the last bastion, I guess, of a fishery that is very destructive in its operation. What I mean by that is that the oyster fishery, they use a boat that drags behind them dredges, which are big buckets with, frankly, metal teeth on them and they drag them across the top of oyster reefs and collect the oyster shells, knock the shells off the reef, collect them up, and bring them on board. And so, it destroys the very reef that these oysters create. And of course, the oyster reefs are really important as habitat, shoreline protection and because of water quality. I mean, every oyster, every individual oyster will filter as much as fifty gallons of water a day. So, they're huge in that regard. They're habitat for all kinds of fish and so forth. So, they're really important in the ecosystem health, and of course, they have shoreline protection. They help deal with storm surges and all of that. So, they have many, many values besides eating them that should be preserved. So, that has always been an issue for me even when I was at Parks and Wildlife. And I started down that road years ago, but these oyster fishermen are well organized. They are politically savvy. Might even want to call them a mafia-like, but not the ones today so much. They are just wily, I guess is the term. Historically, there have been some that were pretty difficult to work with. For example, I started at Parks and Wildlife, I was trying to set aside what today we call marine protected areas through regulations and a couple of the industry members, oystermen themselves, they were from Galveston and they got up in front of the commission and they were complaining about me that the regulations that I was proposing would put them all out of business. And this one particular oysterman who was there, and he came dressed like an oysterman in coveralls in white boots, white rubber boots, and he said, "That blankety blank McKinney, you know, he's nothing but the socialist dupe of the nine dictators' chained dog" (laughs). And I've never forgot, this was even though it was almost thirty years ago, and I mean, what a set of mixed metaphors. And the commissioners just said they were stunned. And later on, they produced a picture for me, and I don't know where it is anymore, with my picture and a big thing that says, "Here stands the socialist dupe of the nine dictators' chained dog," because I was the dupe. The chained dog was the executive director of Parks and Wildlife, and the nine dictators were of course the commissioners. So, he managed to insult all of us at the same time, he was up there trying to plead his case, yet he couldn't help himself. He had to insult everybody. So, anyway, so that's how all that all got started. So, the point being, so I've been involved in dealing with oysters and oystermen for many years, and we tried to do the same thing for the oyster industry as we did for the shrimp industry: buy them out, but they would not allow us to put a limit on the number of oyster licenses. They were very powerful in the legislature. You cannot buy licenses if there is no limit to the number that exists. So, I never got that done before I left Parks and Wildlife. But when I came to HRI, and after we had been here a while, we

were very fortunate in that President Miller was very supportive of HRI when she came on board as president and she provided funding for three new chairs: Dr. Jennifer Pollack and Dr. Joe Fox being two of them, and Mike Wetz was the third. And Dr. Pollack happens to be a well-recognized expert on oyster ecology and ecosystems associated with oyster reefs, so she really knows them well. And Dr. Fox who has a mariculture background and understanding those types of things all around the world. And so when they came on board, and I looked at all their expertise, I thought, “Well, here is an opportunity,” and Dr. Wetz, who is a water quality expert was also a plus for looking at this issue. Because of those three I thought it was a time to come at this oyster business again and maybe come up with a solution in that I failed at with TPWD. I concluded that, unlike what I did with the shrimp industry which was to buy them out, maybe I can just help another industry get started that would out compete them or even better give them another avenue to be successful in a way that was less harmful to our estuaries.. And that opportunity was oyster farming or ranching as I started calling it because we are Texas after all. So, we set down together and talked about that as a possibility, and Dr. Fox actually wrote legislation. This, by the way is the Harte model fully engaged. Not only do we solve our problem with science, but we implement it. So, he actually helped write the legislation that for the first time allowed oyster ranches to be established in Texas. And the idea being is that if we can promote oyster ranches that will produce oysters at the right size and at the right time for restaurants, that would decrease the need for dredging oyster reefs. It won’t eliminate it, but it will decrease it and maybe get it down to a point where that fishery is less destructive. It will create a new industry for the coastline, but also do it in an environmentally sensitive way. And so, we put that program together. Because of that proposal, we were able to attract the attention of the Ed Rachal Foundation. And the Rachal Foundation board has been very interested in helping doing something to improve the quality of our bays because of water quality issues and that type of thing, and they came to us and said, “You know, if we could produce enough oysters to do restoration in our bays, do you think we can help accelerate oyster reef restoration to the point where it would help improve water quality in our bays?” And we said, “Well, yeah, we could.” And so, what we’re about to put together over on our end of the process is the largest oyster restoration effort ever put together anywhere. There’s a project going on in New York right now called the “Billion Oyster Project” where they’re putting a billion oysters in the New York Harbor. It’s a wonderful outreach activity for students and all of that. Our goal here, we think that once we get our hatchery built in Palacios and our research center built in North Beach that we will produce some five billion oysters and have a five billion oyster project, a billion oysters in every bay in the State of Texas that can handle it to work with oyster restoration to restore oysters all around and all together. So, that’s where we’re going with the project. Initially, I was just hoping to create a competitive atmosphere for oyster dredging. But now, it’s grown into this truly large-scale unprecedented conservation program. Not necessarily for me, I just helped bring them together. It’s because we have these wonderful scientists at HRI that have the capacity to actually make this happen.

[1:21:51]

**[JB]:** Yeah, that’s pretty neat. Why wasn’t there oyster farming in Texas before? Was it just because the wild fisheries were so productive, or, I mean, do you know the answer to that?

**[LM]:** Yeah, to some extent, a big part of it was because of recreational fishing, particularly, the Coastal Conservation Association. Some of the oyster farms that started on the East Coast and others were very large, thirty or forty acres and spread out over part of the bays and that type of thing. So, when that was developing in other states, CCA here was concerned that it would take up or destroy too much area from recreation fishing, that it would take areas of the bay out of access to recreational fishing. So, they discouraged it. And the CCA is a very powerful and, you know, effective conservation association. The legislature would just not take it on because of their concerns. So, that was one thing. The other part of it was that the actual oyster fishery itself, the dredgers, did not want the competition. They were incredibly effective in the legislature and kept it out of contention. So, what happened was when HRI came on board with Dr. Fox's work we put it all together. We have a wonderful relationship with CCA, they're one of our great partners in conservation, so we sat down with them and talked about what their concerns were. Again, it's the HRI model in action. When we have a problem, we brought the stakeholders together that we were working with and said, "Okay, well, what's your problem?" And they told us, and so we figured out ways to address those concerns into the legislation, the state legislation, to address those issues, and CCA became supporters of oyster farming. We did the same with the oyster industry. So, that's how that turned it all around and the idea became so powerful. Also, we made the case from a business standpoint, every other gulf state has oyster farming, Texas doesn't. We need to have oyster farming to compete, and by the way it's going to create thousands of jobs and very positive economic impact. That speaks powerfully with Texas legislature these days as you might expect because of economic situation. So, we had CCA's support, even oyster industry support. We made the case that it was an industry that would create jobs and protect the environment. That was pretty hard argument to fight against, and so it was successful.

[1:24:26]

**[JB]:** Nice, okay, what have I missed about Harte? I mean, you're the expert—

**[LM]:** —One thing we could talk about are snapper, red snapper, and the commission that I worked on. That was one thing.

**[JB]:** Yeah.

**[LM]:** That was probably the most important thing that I've done here at HRI. I was asked to chair a national commission on recreational fishing. And it was put together by Johnny Morris, who is the head of Bass Pro, and a fellow named Scott Deal, who was a boat builder, a world famous boat builder and underwritten by the Teddy Roosevelt Conservation Organization, they're not very active in Texas, but as a conservation organization, the Teddy Roosevelt group is well-known internationally and so they became very interested in these fishing issues. They put the commission together with the idea that they felt that recreational fishing was not being managed well on a federal basis and the commercial fisheries were overshadowing it. I was asked to chair a commission that brought together the absolute best fishery scientists in this country and ergo the world to look at the problem over a period of about a year. We brought in all kinds of experts and others to testify and to try to create some simple recommendations for how we'd make sure that recreational fishing was properly put in the model of how you managed

fisheries in the U.S. because the main oversight, the federal guidance to fisheries is the Magnuson-Stevens Act, and that's how we manage fisheries in this country. And it's very focused on commercial fisheries, which is understandable when it was first put into place. That was the big issue because we were having huge foreign fleets, Chinese and Russian trawlers, coming into U.S. waters and taking fish and all those types of things. So, the original Magnuson Act helped us establish those two-hundred-mile economic zones to keep foreign fisheries out and all that, but it was very focused on that issue, and the commercial fishing industry is very powerful in taking fish that also had recreational value like redbfish, which are both commercial and recreational. They were so powerful that they were getting allocations of all those fish, and so recreational anglers and the industry that supported them, you know, were getting the short straw. The Roosevelt group wanted to have this commission that had a group of knowledgeable scientists that would make recommendations of how to rectify this, how to better balance out recreational and commercial fishing. And that's what we did over a period of a year and we came up with recommendations on things like establishing a national policy for recreational fishing. Seems simple enough, yet hadn't been done. We got that done. We made recommendations on how to better allocate fish between the commercial side and the recreational side so it was more equitably balanced. We made recommendations on how to restore fish stock, and this was a big one. Because if you're commercially oriented, if there's a fish stock that's going down, you want to recover it as quickly as possible so that you can again return to extracting the maximum amount of meat from it. So, the federal Magnuson Act treated recreational species just like it. They said, "Okay, if a recreational species is starting to decline, we'll just shut the fishery down until it's recovered, and when it's recovered, we'll open the fishery again." Well, see, they don't think about the fact that this recreational fishery, it's not a meat industry. It determines on people hiring guides, coming to town to stay at hotels, restaurants. All coastal communities depend on this continual happening. Well, if you shut it down for five years, what's going to happen to all these people, the industries? They're all going to disappear and then when you open the fishery again, they're not there. So, you have to think about how you recover a species more gradually so that you minimize that. And there were things like managing the forage base that you had to actually take care of the forage base like menhaden, which we talked about earlier. And the biggest one is that the absolute best managers of recreational fisheries have been the states. The federal agency, National Marine Fishery Service is primarily a commercial-based operation. They understand how to regulate commercial business. They have little to no experience in the recreational side, so they tend to treat recreational fisheries just like commercial fisheries and they're completely different. But states on the other hand have long experience in how to manage recreation. So, there's lots of lessons to be learned. And so, it would seem to make sense that we should have cooperative management between federal and state agencies to promote all of that. So, we made those kinds of recommendations. And we put that in 2017, we put that report out and within a year, Congress had taken it up. I and Dr. Stunz testified in front of Congress on several occasions about this. And interesting enough, the Congress put together what was called the Modern Fish Act, which incorporated every one of our recommendations except forage, we missed forage because of the menhaden industry lobby, I think, anyway it got left out. I don't understand. We missed that one, but all the other recommendations got into it was called the Modern Fish Act and it was passed by the House and Senate almost unanimously. And in December, almost this time of year when we're talking about having this discussion right now, at the end of December, President Trump signed it into law. So that's probably the most successful example for me of translating science into action on the biggest stage, the national stage, that I

can possibly think of except, I guess, maybe you could go in front of the UN and doing something there, So, this is the greatest impact that I've ever had in taking science and actually making concrete changes in the way things will be now and going into the future. So, it was really satisfying in that regard.

**[JB]:** How did that make you feel at the time?

**[LM]:** Relieved (laughs) to some extent because we had put an awful lot of effort into it and these things can easily get derailed. I've obviously worked with Congress and state legislators and I understand that as they talk about sausage, and you know, "If you like sausage, don't go see it being made." And that's true for legislation. It can be derailed at any time and that could have happened any time. It did not. It was successful, so relief was my first feeling but after the relief part disappeared, it was very satisfying to think what I helped get done. I say me, but it was a huge effort, many, many people. I was just a little cog in it really. But just being part of that, means that my son and people's sons and daughters will have the opportunity to actually really fish and enjoy the same things that I did. That will not disappear. Twenty years from now, that will be there because of what we did. It will still be possible and so that's one part of the satisfaction for me. The other is that what most people don't understand is that recreational fishing, because of the taxes on the equipment that they buy come back to states for conservation purposes and the licenses that are sold, parts of those funds, all generates more conservation dollars, more to restore habitat, water quality, and protect endangered species than any other source of funds from anywhere. That will continue because they are generated by recreational fishing. Those monies will still be there. We'll still have those financial resources in the future. Sportfishermen are the biggest contributor, financial contributor, to conservation that ever has been will continue because of what we did under that act. So, I think that's a good thing.

[1:33:05]

**[JB]:** Yeah.

**[LM]:** By the way, we are trying to do that in Cuba as well. That's our big Cuba project. We're focused right now, and we've gotten great support from other foundations, of course it's on a hiatus right now, but the Cubans had come to us and ask me, and some others, and HRI to help lead a group, and we have a big group working with trying to help them develop a recreational fishery that will be sustainable and have all the same benefits that we have been talking about here. So, I'm hoping that when we get back with Cuba, we'll be able to take what we've learned here and help them do the same thing so that they'll have a sustainable fishery in Cuba, recreational fishery as well.

**[JB]:** Um-hm, yeah, I would think that would be a big draw for tourists.

**[LM]:** Well it is now, as a matter of fact. They just don't know to manage it because they don't have any experience. They're at that stage where it has been commercialized to some extent and there's people trying to take advantage of them from the outside, different companies from outside of Cuba that are making a lot of money managing recreational fisheries in Cuba right now and that should be the people of Cuba that benefit not foreigners, what we want is to allow

the coastal communities to take the lead and so they'll have a source of income so that they'll have a stake in protecting the environment because they'll be making money off recreational fishing. Again, it's this interlocked relationship. The people that live on these coastal communities now, and it happens all around the world as well, when you're in these little fishing communities for the most part, they're impoverished. And so, they're just trying to find food. I mean, they're subsistence fishing. They have to catch as many fish as they can just to survive, but if they can come up with an industry, recreational fishing, where they can be guides and those types of things, they make money off the fish as long as the fish are there. They then protect the fishery and the environment because they have a real economic stake in conservation and protecting the environment, protecting the fisheries because they need them economically. So, you don't have to worry about policing so much anymore or regulations because they have an economic stake in it. That's what we want to see in Cuba is for those communities to have a stake in protecting the fisheries because that's how they live. Recreational fishing and ecotourism is tool for both conservation and economic development.

**[JB]:** How have you seen, I mean, those stakes with recreational fishermen change over time in Texas?

[1:35:45]

**[LM]:** Well, I think Texas is a wonderful success story and I think that's one of the successes that, you know, Parks and Wildlife along with the Coastal Conservation Association, CCA played a huge role in that effort during my time at Parks and Wildlife. We became a fisheries agency that managed for recreational fishing as a priority rather than commercial. Commercial fisheries became secondary. We recognize that recreational fishing is the economic driver here in Texas and was also a driver of environmental improvement. In order to have recreational fishing you have to have good water quality. You have to have healthy habitat, and so sportfishing promoted all those activities. Sportfishing generates a lot of money and that is good economics and good conservation. Texas is a recreationally focused management agency for that reason.

**[JB]:** How much are recreational fishers and conservation organizations in Texas focused on freshwater inflow?

**[LM]:** I'm sorry?

**[JB]:** This kind of group, this lobby, how much are they focused on freshwater inflow?

**[LM]:** It is a core issue for all of them. There are entire programs, living waters programs, that have been funded by the Walton Family Foundation, have brought together, like, the National Wildlife Federation, the Nature Conservancy, the Sierra Club, and that's the main group, but probably some others as well. They all do work together on freshwater inflow issues. So, they're very effective and it's high on their number one issue. With CCA, they have other issues too, but freshwater inflow is a big issue for them. As I said, when I was back in Parks and Wildlife in legislature, CCA was protecting me all the time as I was fighting reservoirs that would cut off freshwater inflows. They had my back and that type of thing. So, it's a very important issue for all of them. I've worked hard all my career to try to help these organizations have the science



they need to make that case to their members to continue to support environmental water issues because they have to convince their members that this is an important issue. For example, I don't write a lot of scientific papers anymore, but I have many, many articles in Parks and Wildlife magazines and other publications about water and freshwater to try to help build support for that issue. So, I think that work has been successful to some extent, to keep freshwater inflows high on their list.

**[JB]:** Um-hm, what else do you want to tell me about at your time at Harte?

[1:38:38]

**[LM]:** Been going for a while, that's good. I'm trying to think of anything to cover. We talked about international issues. We talked about the students. I don't know. I think we've pretty well covered it as far as I can—I think we have covered everything.

**[JB]:** Well—

**[LM]:** —I guess one of the things that we're now kind of moving into a little bit, David, Dr. Yoskowitz, is trying to figure out how best to go forward. He is trying to stand up this Center for the Environment and Economy for example. One of the things that we're seeing all around Corpus Christi is this huge economic development. I mean, for example, I sit here at the HRI building and I can look out the window and across the entire Corpus Christi Bay shore over toward Port Aransas, and in just the twelve years that I've been here, the entire shoreline has filled up. And it's an interesting panorama because on one end of the bay where the weather is clear and you see nothing but the windmills that generate electricity. On the other end is a place where they build offshore oil rigs, quite the contrast. Then as you go up and down between those two extremes, you see the development of steel mills, et cetera, and the port, So, the industrialization of that shoreline on the opposite side from HRI is incredible. If I understand it correctly, there's probably something like thirty or forty billion dollars' worth of industrial development still to come there. So, we're seeing Corpus Christi Bay and the Port of course—one of the reasons of course this is all driving is the Eagle Ford Shale oil and gas that are coming through Corpus Christi. And at some point in the future, Corpus Christi will be exporting more oil and gas than goes through the Strait of Hormuz in the Middle East. This is how significant this will be because the oil and gas from the Permian Basin is also coming through here. So, it's a huge development. So, it's a great test bed for figuring out how and if you actually balance economic development and protection of the environment. Can you make sure that Corpus Christi Bay and all the waters around us are still something that tourists will come to, that we want to live around, and not turn Corpus Christi Bay into just another giant sewage treatment plant? Can we do that? Can you actually have economic development and keep the environment in balance with one another?" And we are standing up this Center for Environment and Economy to address those issues. We actually have a building downtown, the old [J.C.] Penney's building that the university has purchased. HRI will have a floor on that, and our whole idea is to take what we have learned over the last twenty years and the expertise that not only we have in the institute, but that exists in the university. There's a lot of expertise in the university that we can be a conduit to help bring together with the industry side to make sure we can have economic health and environmental health. So, if we can do that here, perhaps we can export those ideas to

other places of how to keep this balance. That's the goal. So, I'm sorry to some extent that I'm retiring and will not be able to be here to see that grow and develop. I think it's going to be really important, but the person that's in charge of HRI right now, Dr. Yoskowitz, who is a socio-economist, probably is the absolute best person to be in a position to help try to balance all of that. So, I think that's going to be one of the important areas that HRI will grow in the future. So, I'm excited about that, and it's much needed.

**[JB]:** All right, well if there's not anything else, I think I'll turn the recorder off.