2004 Indian Ocean Tsunami
Dwayne Meadows Oral History
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Interviewer: EA – Eve Austin
Transcriber: NCC

Eve Austin: Okay. So, this will begin an oral history with Dr. Dwayne Meadows. This year marks the 20th anniversary of the Indian Ocean tsunami, which I now know is sometimes called the Boxing Day Tsunami or the Asian Tsunami. You'll tell me more later. So, we're conducting interviews with NOAA personnel who have significant experience with tsunamis and expertise related to tsunamis. The interview is taking place today, September 18, 2024, remotely via audio/video recording on Zoom. The interviewer is Eve Austin. I'm in Ithaca, New York. The narrator is Dr. Dwayne Meadows, and he's being interviewed while he's in Maryland, I believe.

Dwayne Meadows: That's correct, yes. Frederick, Maryland.

EA: Okay, Frederick, Maryland. Well, like I said, I'd like to just start at the beginning and have you tell me a little bit about you, where you were born, when you were born, and go from there.

DM: Yes. Even that's out in the wide world is part of the story. I was born in 1966, and I spent my childhood years up until I went to college in the Cleveland area of Ohio. But my parents were both good swimmers. My brother and I were both competitive swimmers as kids. Just early on, watching Jacques Cousteau and all sorts of things, I got really interested in the underwater world, animals in particular, and scuba diving. I know I nagged my parents for some years. Back in those days, basically, you couldn't get certified as a scuba diver until you were fifteen years old. That was my birthday present for my fifteenth birthday was scuba diving lessons. I couldn't even drive a car at the time; my mother had to drive me to lessons. I was living out in a very rural area. It was half an hour more just to get to the lessons. I loved it as I kind of knew I would and was fortunate to be able to take a couple of trips out of the cold waters of Ohio to some prettier places. That just hooked me. I was fortunate enough that in Ohio, there were a couple of folks associated with the schools who ran a summer camp for scuba diving in the Cayman Islands at that time. I was able to go along as a camper but also a part-time helper to be able to afford to go. Some of the students weren't certified already, so I helped teach them diving in the morning, and we got exposed to actual scientists as part of that summer camp who are doing marine biology. That was my first real connection with marine science, marine biology. Again, I just thought it was fascinating. So, as I looked at going to college, I had the opportunity to go study in California at the University of California, Berkeley, and became a Biology major, really interested in Marine Biology and studied there for my undergraduate degree. I had an opportunity to be an exchange student. So, I did spend a year during that time diving in Australia, where I studied at Sydney University in Australia. A professor there was looking for some students to help out with the project. He thought it was the most boring part of the project, studying mostly clams and snails that they had collected on the Great Barrier Reef, but just in a laboratory in Sydney. He didn't have any money to actually pay me, and so he really didn't think he was going to get anyone interested, I think. But I was on board, and we worked out essentially a barter arrangement where I got to go on one of their trips to the Great Barrier Reef at their research station called One Tree Island and worked for him for three weeks between periods of university terms. I was a photographer from the early days. He threw in some film for me, and that was my pay for working for him for a few hours a week for a year: that trip to the Great Barrier Reef. It was just fabulous. More importantly, for my career, he had been himself, I think, on a sabbatical in California. He had mentored a young, up-and-coming PhD who became a professor. He put in a good word for me. That professor, Mark Hixon, became my PhD advisor at Oregon State, where I went. After a year break, I spent a little time working

for the State of California on salmon and a summer working on lobsters in Maine. I went to graduate school at Oregon State University and got my PhD there, studying coral reef fishes, mostly in Panama. The Smithsonian Institution has actually three marine laboratories in Panama and some tropical forest laboratories as well. So, I get to spend about two of my five and a half years of my PhD in Panama studying coral reef fishes. That's sort of the early educational background.

EA: Yes. So, if this hadn't happened, who knows, right? I mean, the birthday gift, the summer camp, clam study, all of that. Each one led to more and more opportunities for you.

DM: Yes. I'm a first-generation college student. Nobody else in my generation actually even went to college. I didn't really know what it was all about. I didn't know what being a professor was all about. But essentially, people kept paying me to do interesting things and to go scuba diving. I said, "Well, I'll keep on." I did a couple of temporary professor jobs, and then I got a tenure track professor job at a non-PhD granting university. We Weber State University in Utah, where I taught for six years, and I was doing some tropical research in Puerto Rico in the summers. Then, I had an opportunity to go to Hawaii to be the director of research for a nonprofit organization called the Pacific Whale Foundation, which had a model of generating money for research and education programs by doing ecotourism tours of the whales, obviously in the name of the foundation. But they had branched out to doing dolphin trips and snorkeling tours on the coral reefs and watching sea turtles in Hawaii. It had started as a side project for a guy [Dr. Greg Kaufman] at the time who was doing his PhD on humpback whales. Now, it was supporting – I had a department with four full-time staff and a number of part-time staff, and we did Earthwatch-type summer internships for students, adults, various sorts of people who wanted to learn about the different things that we did in all those areas. Unfortunately, I started that job in July of 2001, and September 11th happened, and the changes to especially international tourism and airport security and all those things had a really big effect, especially in Hawaii, where a majority of the tourism was foreigners, especially Asians at that time. Then, some months later, we had the effects of the first SARS [severe acute respiratory syndrome] epidemic. So, my whole department was let go with six weeks of pay. I scrambled and eventually started working for NOAA [National Oceanic and Atmospheric Administration] as a result of that occurrence. This was an organization that had a twenty-year history. So, it didn't seem like it was a big risk to take a position there [with] hundred employees. That's how I found myself, though ultimately, originally as a contractor for NOAA, working in the coral reef program in Hawaii, and then later became a federal employee. The first project I was hired for as a contractor was to go out to the Northwestern Hawaiian Islands – projects that NOAA still does – both studying the reefs and working on these multi-function expeditions to remove marine debris, mostly fishing nets, that were entangling sea turtles and the endangered monk seals that live in Hawaii. So, we were committed to spending basically four out of five months that first year on two trips to the Northwestern Hawaiian Islands. As a part of that time period, twenty years ago, we had built up a lot of vacation time. The first thing that became relevant to my tsunami experience was that I had a bunch of vacation built up. The second thing that happened that year was that my mother's aunt passed away. She gave my mom some money, which my mom used part of that to have a family cruise trip to the Caribbean. She had scheduled that for, I think, it was like January 10th [2004]. So, I figured I would go back then, and that was going to be my Christmas visit with family rather than actually being home on Christmas, which was my

normal routine pretty much ever since I went to college all those years ago. I had a friend from graduate school in Oregon who was a Thai citizen. After he finished his PhD, he went back to Thailand and was a professor in the Bangkok area. I hadn't seen him in many years. I decided that I would go visit him. Basically, the week before Christmas, I spent with him touring Thailand. Then, he had to go back to work and his other obligations. I had arranged for a three-day scuba diving trip, my first chance to go scuba diving in Thailand on a liveaboard boat with just a few other people. We came back on Christmas Day from that trip. So, I basically spent a week and a half traveling and needed a break. I was in this part of Thailand that was an up-and-coming resort area, mostly a family resort area called Khao Lak. It was north of Phuket, which was famous at that time, especially as sort of a place where college kids went to have a lot of fun and do crazy things.

EA: I read the name of the town you're in. But can you pronounce it for me again?

DM: Sure. It's called Khao Lak, K-H-A-O-L-A-K is how it's typically spelled.

EA: Thanks. Then, before you move on to talk about the day after Christmas, too, I want to make sure to pause if that's okay with you. If you're on a roll and you want to keep going –

DM: No. That's fine.

EA: – I want to make sure we get a chance to pause so I can go back and ask you some questions. But I didn't want to cut you off before you finish Christmas Day. [laughter] Is there more before that?

DM: Well, actually, it's good that you stopped it there. I don't know what all you want me to talk about. A lot of people are interested in – one of the things that happened that day was I met Caroline. She is part of my story that I tell at various points in time. But it's not necessarily my story or whatever. There are parts of it that overlap with my looking for her later and things like that. But it's not just fundamental for something like this. So, I can spend more or less time talking about some of those other things as you're interested as well.

EA: Yes. I read a bit about Caroline, so I am interested. But I just want to understand, especially because you said you're a first-generation college student and you're in Ohio. So, I guess there are lakes in Ohio. I haven't spent a lot of time in Ohio. But why were your parents competitive swimmers? Where did that come from? Were their parents swimmers?

DM: Yes. The whole family loved to swim. We grew up very close to Lake Erie. My elementary school was one block from Lake Erie. My grandfather taught me how to fish. We used to spend a lot of time at the beach. In those days, sometimes a little bit further away from Cleveland because it was still pretty polluted. But that also kind of, I think, played a role in my mind as an ecologist, seeing the damage that we could do. As you may be aware, the river, the Cuyahoga River that dumps into Lake Erie, burned in the ’60s. My grandfather contributed to that, making oils for trucks right on that river, right in the area where it burned. The things that people did back then. So, yes, we were always very much interested in water. As I got to scuba dive, I didn't really know what that meant locally at the time myself, either. But there are a

number of particularly quarries that are more controlled environments where you typically learn where people dug the quarry for sand or rock or whatever it was. Then, eventually, they hit the water table, and they start to fill up and create these beautiful, calm ponds. Because there's rock or something, they have better visibility than just some dirty pond with a mud bottom. So, they're actually reasonable places to scuba dive. Then people do fun things like put airplanes or boats or cars down in there that you can swim through. One of them in Ohio, strangely enough, was excavated to a certain level. It was so huge, this quarry, that as they moved on and moved the quarry to another place, the land was so extensive in this excavated quarry, it was actually turned into a farm, an entire farm property with barns, and a big corn silo. Eventually, they were still doing a quarry over here. That hit water, and the water eventually filled up the quarry and the old quarry that was now the farm. So, you could actually scuba dive through this farm silo, swim in the bottom, and then go up to the top. It happened pretty quickly. So, there were a lot of farm implements that were literally just left where they were standing as a little time in history. Then Lake Erie itself, of course, is famous for shipwrecks. So, a lot of divers in Lake Erie do shipwrecks. I even was crazy enough in those early days to do ice diving in the winter, where you cut a hole in the ice, pour hot water down your suit, and go underwater. Then you can turn yourself upside down and basically walk on the underside of the ice, which is a really fascinating experience you only want to do once.

EA: Only once, huh?

DM: Nowadays, people have better dry suits. But you still get your face and hands cold and wet. So, that kept me going for my teenage years, mostly.

EA: Yes. Did your brother also end up with the same kind of interest as you?

DM: My brother?

EA: Yes. Did you say the two of you used to swim competitively?

DM: We did. We were both swimmers. It's the only thing we really shared, interestingly. I became a football and baseball player as well. We moved out to the country, where we didn't have competitive swimming. He was a runner, a long-distance runner. So, he never got the diving bug, interestingly. Nobody else in my family did okay despite all the interest in swimming. Nobody was into scuba diving.

EA: You identify yourself as an ecologist. I was going to say an environmentalist. I guess I don't really know if there is a difference between ecologists and environmentalists. I was imagining your family was also ecologically minded, but it doesn't sound like it necessarily. They were more into the outdoors.

DM: Yes. I think because of that, they were ecologically sensitive. I mean, we usually think of an environmentalist, at least in those days, as somebody who's a little more of an advocate in ecology as the science part of it. I blended that. I always tried to do practical science in my career that had some relevance to conservation. But there are certainly ecologists who only study very scientific questions. They use a certain set of animals, mice or things that are more

just representative and easy to study, rather than things nobody wants to really save mice, per se. But they can be easy to study because they don't go very far. The fish that I studied for my PhD are related to these clownfish. They sort of study animals a lot because their territories are usually only a meter in size. So, they make for very nice scientific subjects, as opposed to animals that travel hundreds of meters or kilometers at a time, where they're much harder to do experiments on.

EA: That's pretty interesting. So, if someone in the future is listening to this recording, they're not going to see your picture background behind you. But it's a picture of a clownfish, and you said you took the picture yourself. So, tell me a little bit about that.

DM: Along with my early interests in diving, I was fortunate enough – one of these people I went to the scuba camp with was a very avid photographer and was gracious enough to sort of teach me. I eventually helped him and another colleague as an assistant instructor when they were teaching scuba diving. Again, worked out a little barter thing. One of the things I wanted from those guys was their knowledge about how to do underwater photography. I think as a graduation gift, as I recall from high school, my parents gave me a very nice Nikon camera that I wanted and the underwater housing and things to do photography on my own. I had borrowed equipment up to that point. So, when I went to college, I worked in a scuba shop and helped teach again. Every free time that I had underwater, I was taking pictures and kept that up for a long time. Now I don't get to do as much fun diving, and the cameras and the digital cameras, they're always changing every couple of years. So, I haven't done as much photography in the past decade or so as I used to. But, yes, in Thailand, the first time I was there, I was still doing photography a number of trips there, and the Philippines and Australia. I got into a little trouble doing some photography on my own –

EA: How so?

DM: – during my college time there. When I was at that marine lab, I was wanting to take pictures. But of course, they wanted me to do the work during the day. The staff person – we were both working for a professor, but the professor wasn't there – said, "All right. I'll let you go out at night here, which is a really cool time to dive and take some pictures in this bay." He didn't want to dive, but he was going to sit out on the beach. Generally, a no-no to dive on your own. Typically, you dive with a partner. But he said, "Just dive around here. I'll see your light." It's like eight, ten feet deep, or whatever. It wasn't very deep. It's a very calm little harbor. But the manager of the laboratory wasn't aware of this arrangement and found out and told the professor. When I got back to Sydney, the professor called me into his office. I thought I was really in trouble, not only for that particular event but again, this was a very influential scientist who, as I said, eventually helped me with my career. I was worried that was not going to happen. So, I was quite nervous when I went into his office. But as it turned out, he thought it was fantastic that I was so eager and that we had made a relatively safe arrangement. He and some of the old-school guys, anyway, were sort of pre-some of these more modern safety rules. So, in the end, he was actually more impressed than upset. But he still had to make sure that I was complying with the official rules of the laboratory. But yes, that sort of shows how keen I was to do photography and just be in the water as much as I could in those days. I just loved it.

EA: Strong sense of adventure you have, too, it sounds like. Your parents sound like they were also pretty supportive of the things you wanted to do, at least in terms of swimming, diving, and photography.

DM: They really were. I had friends, I think a lot of people do, whose parents were pressuring them to study this or that, be a doctor, lawyer. I think my parents were just happy somebody was going to college and that sort of thing. They were very supportive. Although I remember years later, my mother admitted to me that there were a lot of times when I would tell her – the other thing I used to do when I first went to California was take my bicycle all over San Francisco, across the Golden Gate Bridge and things. I remember one time she told me how – I told her about going across the Golden Gate Bridge by myself on my bike and how nervous and worried she was. But they always sort of kept it for me and just encouraged me to be myself, and I appreciate that and more as I get older.

EA: Yes. I haven't forgotten, of course, the event we're going to talk about is the tsunami that you lived through. But just since we're talking about parenting and kids, I guess, I'm curious about you and if you have your own kids. If they're interested in the water and how you've parented around that.

DM: I do. I have a son. Actually, just about a year before the tsunami, I had gotten divorced. He moved to Hawaii when he was very small, so he grew up around the water and was very comfortable in the water. I became a little worried at one point because I'm not a surfer, and he was becoming interested in surfing. He was also a bit of a daredevil, and I thought that might be a dangerous thing to have a little daredevil attitude and be surfing on Maui. So, yes, he grew up being very, very comfortable and loving the water and respecting that. But interesting – his mother has a musical background. She was a singer and also a biologist. I myself, of course, being a scientist, he does sound design for musical theater. He's got three shows on Broadway already. He's twenty-five, and music has become his real, real passion, but he still obviously loves the ocean. He spent most of his childhood in Hawaii.

EA: That's cool.

DM: Yes.

EA: Okay. So, just also sticking with your career, we can pause on the career and talk about the tsunami and what happened. Then, pick up back to where your career has gone in the last twenty years if that's okay with you.

DM: Sure. That's great.

EA: Okay. So, you were telling me it was Christmas Day.

DM: Yes. It was Christmas Day, and I had gotten back to the mainland of Thailand and was in this very lovely family-run resort with a bunch of duplex bungalows. Just two rooms right on the beach, looking out at the ocean, a beautiful sandy beach. Then, a lot of just beautiful gardens and vegetation. I just really wanted to relax for a day or so. I had stayed at the same place the

night before my dive trip, but it was pretty brief. I was looking forward to going back because it was so beautiful. I spent most of the day just relaxing. Then I went out and met some people that evening and explored the town a little bit, which was very spread out because there was a national forest behind it. So, there were mountains. So, the town itself was sort of stuck between the mountains and the ocean. There was basically one main paved road. Then, there was a partial parallel road right down the ocean that had a number of mostly small resorts like this and some beachside restaurants and bars. Then there were a lot of shops and bars. There was a grocery store and other things along the main paved road. There's a lot of, I think, Commonwealth, British expats in Thailand. They have a history of relationships with the Commonwealth. So, for them, Boxing Day, a Commonwealth holiday, is still honored and recognized, at least in that tourist area where you have a lot of foreigners. A lot of them were working in the tourism industry as dive guides and that sort of thing. So, for them, it was still another holiday the next day. So, I decided I was just going to relax that day. I had three or four more days that I hadn't really specifically planned out any major activities, like the early part of my trip. I had some ideas. But I was pretty flexible. I met this German woman that night before, and we agreed we'd meet for breakfast on Boxing Day morning and just hang out that day and snorkel. She was interested in scuba diving in the area. She just arrived in the area. So, we had breakfast and decided we were going to meet and just kind of snorkel, just do casual snorkel on the beach. But we both needed to go back to our rooms. I forget what she was doing, but I had been on this dive trip and traveling with my friend. I had a bunch of dirty laundry. They offered laundry services there at the little resort. So, I was going to go back to my room, we were going to meet in fifteen minutes, and pack up my dirty laundry into my – I had basically a hiker's backpack – and get that, take it over to them, and have them start cleaning it so that I would get it back in a couple days before I left. I was in the middle of doing that when everything changed. So, even though I had this bungalow that had sliding glass doors and a small little deck with some steps – it was about six or seven feet off the sand, looking out at the ocean. It was gorgeous. I wasn't actually looking out at the view at that point. I was just scrambling around. I had this armoire, and I had some clothes everywhere and things in a couple different bags. I was just sorting it and putting it together and throwing stuff in there. It was at that point that I heard people scream and looked out the doors towards the ocean and sort of immediately realized what was going on. Living in Hawaii at the time, we would always get the monthly tests of the tsunami sirens they have there that they would use both literally as a test, but also as a reminder to people, yes, we're in a tsunami place. Time to think about what you might do if something happened when you were here, wherever you were at that moment, and how you would get yourself as safe as possible. So, looking out at the ocean after people screamed, I could see this fine white line out in the distance, maybe a mile or something offshore. I immediately knew it was a tsunami. But in all the stuff you hear about tsunamis, I hadn't really thought what it would look like and how I would tell the difference between one that was just sort of small and one that was big. We did not have any warnings where we were at. There wasn't a lot of TV or technology at that point in time, twenty years ago. No, there was no discussion even about an earthquake that morning that had happened sometime before while we were still at breakfast. So, we were completely in the dark in our area, I think, along the beach. So, nobody really understood what was happening. The thing that sometimes happens with tsunamis because they're waves, sometimes, the first part of the wave that comes to shore is the part that's the low part. What that means is the water pulls away from the shoreline. That's what happened where we were out in Khao Lak. So, what people first saw was the water leaving the

ocean and a bunch of fish and animals flopping around, and they thought, "Wow, this is weird. Let's go see all these animals or see what's going on." A lot of people actually did the worst thing they do, which is actually go towards the ocean at that point in time. So, at that point, that had already happened, but people weren't screaming. They were curious. The screaming really happened because, in this area, it just so happened that the Royal Family of Thailand, there was a king at the time who, since passed away, he had, I think, a couple of daughters and a son or two. One of his daughters – the king was, at that point, I think, in his sixties or maybe early seventies. So, his daughter was closer to my age. She had teenage children and early twenties children. I'm not sure about the daughters, but her son was out jet skiing. She was there as the daughter of the king and queen. So, there were all these royal princes and things around. They had security, and that security included these two boats that – when I always talk about it, I say they were like John F. Kennedy PT boats. They were gray. They weren't huge Navy vessels, but they were seventy feet long and gray. They had a couple of smaller guns on them, and I think fifteen or twenty sailors. There were, I guess, also security guards on jet skis and on land and other places. But what the people saw were these two gray military boats. When this white line that looked like a little wave hit them, what you see in the videos from that day, they started to toss these really large boats around like they were toys. That's when people realize this is a serious, dangerous thing. In fact, as far as I know to this day, one of those boats has never been found. One of them washed over a mile inland and is now a memorial monument site for the tsunami. So, that's what we're talking about, these enormous boats getting tossed around and washed. That's when people screamed and realized they needed to get away. At that point, I saw that, recognized it, but also realized I couldn't really do much for myself because I would have to go to the ocean, go down the steps, and there was no back door. Around the sides of the buildings, there were these bougainvillea plants, which are very pretty, small flowers but spines twice as long as a rose spine. You don't want to go through them just naturally. So, I kind of thought, "Well, it's going to be a long way around, and I'm not going to make it. I'm probably better staying up high in my bungalow." I really thought that this wave was going to just wash under the bungalow. It wasn't going to be very big. I even did this silly thing where I thought, "It's not going to be a big deal, and I don't want to get my stuff wet or ruined." I had this backpack on my own. I decided I'd throw up on top of this armoire because that would keep it dry. Then I could do something with my hands, I guess. But very quickly, that was not really what was happening. The wave came up and came into this bungalow, crashed through, and I was just really starting to panic because I thought I was going to be stuck in the bungalow as it kept coming higher. I saw off to the side of me the wall of the bungalow started to fall. All I remember is I just dove in that direction. I don't know if I really dove out or if it just sort of all collapsed around me. But very quickly, I was underwater, and I was spinning and twisting for quite a long time. The work I had been doing all those months in the Northwestern Hawaiian Islands – we were doing a lot of breath-hold diving. I could hold my breath for three to four minutes if I wasn't stressed and full of adrenaline and was prepared for this. So, it probably wasn't that long. It was probably only a minute or so that I was underwater. But I never thought I was anywhere near the surface. I thought it was really deep because it was dark. So, dark underwater, like it was nighttime. Even if you close your eyes, you can tell that it's daylight out. But this looked dark, and I was just spinning. I really didn't know which way was up. I remember this life-flashing-before-your-eyes kind of thing, thinking about my son. I remember saying goodbye at some point, realizing I didn't think I could hold my breath. I didn't think I was near the surface. I was swimming, but I didn't know if I was going up or down, honestly. I was just doing something, and I came up.

Very surprising to me that I just sort of popped up to the surface. Because I never knew that I was close. When I did, I thought, "Oh, great. I'm going to be okay." Then it's like, "Wait a minute." This is really bad because this water is moving really fast. A lot of times, when you're in the ocean, you see a wave. It moves you a little bit to the side, but it's mostly an up-down kind of thing. But this was like being in white water rafting trip in some enormous river with the tops of palm trees at the surface of the water. So, those are thirty, forty feet high. So, I knew just how deep the water was at that point. I knew that I was still over land. But everything else became very quickly just trying to stop from getting hit by debris or hitting trees really hard. But mostly, it was things in the water, bits of wood and metal. A lot of the cooking and refrigeration was using either the normal size that we see of propane tanks or much bigger ones. Those were floating. Some of them were leaking and hissing. So, it was very noisy. There were cars floating around next to us. Bungalows floating around still intact with mostly just the roof sticking up. So, it was this crazy, very three-dimensional thing. Normally, I think you go in the ocean, and it's very two-dimensional. Your head is above water, and you just see this stuff. But now there were just these enormous piles and things floating around. You couldn't see very far and could hear all the noises of metal and the gasses and people screaming, but I couldn't see. I never saw anyone for the longest time, although I heard them. So, I was really just trying to not get hit by things. Then, there was a point where I had on these Teva strap-on sandals, and I realized I was starting to get pulled under the water. My head was at the surface, and something I realized was caught between my ankle and the sandal bottom and was just pulling me down. So I was able to reach down. I had to stick my head in the water a little bit. I did this thing where I unstrapped the sandal. I did a very scuba diver thing that you learn, which is, you take your fins. They have a little strap on the end. You put that around your wrist, and then you have your fins hang out. If you need to climb up onto a boat, if you fall back in, you still have your fins with you instead of throwing them up on the boat or something. You have them with you. You can put them back on if you need to swim in some place where there's a current or something. So, I did that very kind of unconsciously, put the sandal on my wrist. But things were okay, and I was moving along. I found a spaghetti noodle, one of those foam swimming pool spaghetti noodles to float with. Thought that was helpful. But then I hit a tree, and I thought maybe I'll just hold on and then climb down when the water comes down. But I realized pretty quickly that that wasn't a good place to be. Because there was a lot of stuff hitting me in my back. My back was to the force of the water. So, I couldn't get the debris away, and I was getting hit by wood and things. It felt like I could get hit by something very sharp and would never even see it coming. So, I decided I would just let go and that I was better off just kind of going with the flow. Even though there was debris, you were not running into it at such a high speed. You could kind of push it away, and it hadn't been a big deal at that point. So, I did that, and I lost the noodle. At that point, I saw a cushion, or I think it was a mattress from a bed. I thought, "Oh. This will float really well. It's like foam." It turned out, as I learned later, they actually stuff a lot of their cushions and mattresses with husks of coconuts. They just get soaked with water, and they don't really float like foam. So, that quickly was not helping much at all. So, I let that go. I was still – this had to be some minutes later – still just flowing through the water. At that point, I didn't really know where I was. I was just looking around me, trying to not hit anything dangerous. At that point, the funniest part of my story was I found a mannequin. All throughout Thailand, they have a lot of silk that they make from the raw materials right there from the silkworms. There are a lot of shops where you can get dresses or suits made in two or three days from whatever piece of fabric you choose. So, they have lots of shops and stuff. Of

course, there were other fashion shops or whatever with clothing. But my resort had a little – the only store in the resort was a little silk shop that made suits and dresses and things. So, I say it came from there because I got a picture of it. But anyway, I found this mannequin, which – I didn't know a thing about mannequins, I guess. I never worked in the store. Two pieces. There was a lower half of the body, and I found the legs up to the waist of this mannequin floating. It turned out to be hollow plastic, like the perfect life preserver, if you will. In both senses of the floaty-ness – of a life preserver. But for me, it was so large; I was sort of hugging it to my chest in front of me to hold on to it and to keep it floating. So, the waist was up here, and the legs were down with my legs. It turned out, lucky for me, that it was so big because it also protected me in the end. As things finally start to calm down, I realized that I had – somewhere along the line early on, I think, as I was underwater twisting, had twisted my left leg so that my ankle, my knee, and my hip, every joint, was twisted and sprained. I could tell I was going to have a hard time walking. I thought, "Well, this thing would make a great crutch." So, I started thinking, "Oh, this will be really helpful on land as well." But eventually what happened was the water calmed down. As I started to look around, One I didn't know where I was. I couldn't recognize anything. Two, I was way out in the ocean, something like a quarter of a mile out in the ocean. So, the wave had washed me inland initially, through these – there were these palm and rubber plantation forests, and it gets back out into the ocean. As I learned later, about half a mile to the south of where I started – so I probably traveled about a mile during this whole time in the water. I realized if I was going to make it to shore, I had to do that swimming through these debris piles. So, it wasn't a straight line and just kind of making this curving route that I could try and pick out of what looked easiest to swim through to get back to shore. The other thing I admit that I hadn't thought about at all up to that point was the possibility of another wave. Even though you learn that there's just so much going on, I wasn't thinking about that. But as I got close to shore, what I saw was that there were these occasional rocks that were normally out in the water, fifty feet, a hundred feet from shore, that I had seen previously. But the one that I happened to be swimming towards was well out of the water. The various animals, the snails and the barnacles and those sorts of things were way up here where they shouldn't be. They should be near the water. That was, for me, as a biologist, a glaring sign that the water was again out. There was another wave coming that was going to be somewhat big. I didn't know how big, but the water level looked like it was six or seven feet down from where it should be. That's when I really started to panic yet again. Because I knew with my injuries that another wave, I wasn't going to survive. So, my heart started racing. I think I swam a little bit quicker. As I got to shore, I realized that the mannequin had gotten a number of holes from some sort of debris that had poked holes in it. So, it was filling up with water, and it wasn't actually floating anymore. It wasn't going to stick around and wait for it to drain and use it as a crutch. I left that and made it onto shore. As I did, there were a few other people around. We started to make our way, most of us, away from shore. But the other folks didn't realize another wave was coming. Some of them were looking for partners or spouses or family members, whatever, and didn't really want to leave. It became a very difficult thing going through my head about how do I encourage these people to leave without scaring them so much that they would freak out or not come. So, I tried to say, "Look, we can't see your friends and family. Let's go by the road." That worked for a couple of people. But I remember one woman just really wanted to stay. I finally said, "Well, I think another wave might be coming." I tried to be as gentle as I could. Fortunately, she came, and we had a little band of – it started with seven or eight of us, and slowly, more people joined, trying to get out. It was the same problem as in the water that nobody else had a single shoe. I was the only one who

had my one sandal, which I put back on. There were puddles, but looked like big puddles. Later on, I learned it was this weird swimming pool that went in front of different rooms in a resort. It was this amorphous thing. But for us, it was just debris and puddles and stuff. We were trying not to injure ourselves anymore. But we couldn't help but walking through certain puddles to do that. That looked like the best route. So, I would use my sandal to kind of shuffle along to make sure there wasn't anything that was going to cut our feet. So, I was literally the head of this little pied piper line of people going towards shore and finding more people and seeing a lot of dead people along the way who didn't make it. Eventually, fortunately for us, we were able to get to an open area, the next little road. We were able to run from there, where it was a little bit more open. It was at that point that the next wave came. Fortunately for us, it wasn't as big as the first wave. In some places, the second or third wave can be bigger than the first, but we were fortunate it wasn't. So, none of us were in the water that second time around, but it was close. So, we eventually made it up to the main road. As we were walking, I remember there was a gentleman. He and I who started talking about he thought his family and his resort was to the south. I thought where I had come from was to the north. We said, "Well, we should start to make a list of names of who we are and who we're looking for and share those lists." To the north, there was the grocery store, kind of the main intersection. That was the direction I was going to go. We thought that would be an important place. There were a couple of bigger resorts in his direction that he figured were up on a hill that also might be safe. So, we thought those would be two places where people would congregate. So, there were these Thai people in some of the stores that hadn't been underwater. Some of the main road wasn't underwater. They were starting to help people. They were giving people water and clothing. A lot of people had lost – my swimsuit had been torn, but was still on, but probably somewhat revealing. But there were a lot of women who had bikinis and things on and part or all of their bikinis were ripped off. People were naked and, obviously, shy about that once they calmed down. The Thai people were fantastic. They were handing out touristy t-shirts. One guy gave me a hat and sandal and then something else to put on my foot because it was very hot. It was 10:30 in the morning at that point. It's going to be a very hot, sunny day. But I think he thought we were crazy because we asked for paper. It's like, "Why the heck do you guys need paper after you just went through this horrible thing? I've been giving out t-shirts and water and flip-flops." But we eventually communicated – I didn't know very much Thai at that point. We started making some lists. There was a tent. Everyone in the area wrote their names down, and people started dispersing. I carried that list up towards the grocery store. When I got there, in that area, there was a guy that said, "Oh, we heard on the radio; there's another wave coming. You should go up the hill." There were some resorts that were even further, mostly up, at this point, in the forest. He pointed to one that turned out to be not even open yet but was pretty much fully constructed. I started making my way up there. As we learned, in Khao Lak, there was about a mile section at either end of us that was washed out by the wave. So people couldn't get in. The roads were completely washed out, and we couldn't get out. So, we were stuck. I ended up at that resort fairly quickly. I was exhausted at that point. I had come across this teenage Swiss girl who was in tears and very freaked out, missing her family. I was trying to console her a little bit and bring her along with me. I said I'd stay with her and help her find her family. When we got there, there were some mostly expat English speakers who had worked in the dive shops. There were a lot of them in town. So, they had a little bit of basic first aid and CPR training, and they were starting to triage people's injuries. I told them that I had this kind of advanced training. I'd been a CPR instructor since I was a teenager, and first aid. But NOAA – this work we were doing in

the Northwestern Hawaiian Islands – had trained us up even further to the level of basically a paramedic because we were so far from Oahu in the Northwestern Hawaiian Islands and so far from help that we needed to be independent. So, we were taught how to do stitches, how to give people IVs, and how to do a lot of really advanced things under the direction of a doctor that we had communication with at that point through fairly primitive satellite phones in those days. They sent us packing with a huge kit that included a lot of narcotics and various sorts of medicines that you might need in an emergency situation. Then, we were authorized to open those up when we needed to under the direction of a doctor through the satellite phone. So, we learned all the techniques you needed to do those kinds of things. We had a lot of advanced equipment for immobilizing somebody with a broken neck for days at a time, not just a little thing to get you to the hospital ten minutes away. So, I said I've got this advanced training, but I need a few minutes to catch my breath. Literally, that's all I got was four or five minutes before they came to me and said they had this little boy who was blue and had a hole in his chest. They did what they had tried so far – they weren't sure it was the right thing, and could I help? I basically used that training that we had gotten through my NOAA work through a group called the Wilderness Medical Institute. I spent the rest of the day doing first aid on people. It wasn't until a few hours later that the first actual professional nurse showed up, a German woman, and started helping us. She was just a tourist. Then, an hour or so later, a doctor, a Serbian, Dr. Luba Matic, who had been a trauma surgeon during the war in the former Yugoslavia in the '90s and had left there to be a scuba diving doctor doing recompression chamber operations, bends, these things that scuba divers get, and that had become his specialty in the area. He had taken his motorcycle and come back to Khao Lak, where he was working. He'd actually been out of the danger zone that morning but was worried about the area and some tanks of gasses that their facility had that he was worried would cause damage and explode or something. So, he came back in first to deal with that and then to help out where he could. He was our first doctor, but he wasn't there till mid-afternoon that first day to help out. So, for me, I spent the rest of that day helping him as his assistant, whatever he needed in treating people. We saw all kinds of different injuries and wounds to people during that day. For me, it really helped not to think about what was happening. Those first few minutes that I was sitting in the grass catching my breath, it was just a horrible experience because there were a lot of people who were very freaked out, very sort of hysterical at that point, either because of what they had seen, or because they were missing family and they knew or thought they knew, that loved ones were not well. Other people had the opposite reaction. They were very catatonic and not reactive, in shock. So, it was a horrible experience. The kids that were there were all looking around, trying to take cues from the adults. They were clearly traumatized but didn't quite know how to react in many cases. Many of them were separated, so they were upset about their family as well. It was just a horrible thing to sit there and think about what we had been through. We still had no news of what this was, how big it was where I was at. There were other places in Thailand and around the area that had learned about it earlier. But it was maybe another hour before people who had radios started to help the group out by sharing news. There were lots of false rumors of more waves. Other people helped out with finding some food and water. I had as much water as I needed that day. I didn't really eat that day, but people were finding supplies that really helped us out in the heat. There were people from over forty countries in Thailand that died that day, and maybe more were there. So, when we were doing first aid, one of the interesting things was sometimes we needed multiple translators to get between the language of the first aid person and the language of the person who was hurt. All over Europe and Asia, all those languages were

represented, especially in some South America, that sort of thing. So, it was really challenging, but a lot of people really stepped up and helped out in so many different ways that day, which is one of the things I always come back to for me, about that is thinking about all the good acts I saw that people engaged in that day, helping with food, water, interpreting, first aid, if they could do it. We didn't have a lot of first aid supplies. So, some people were helping us – we helped set broken bones with little PVC construction pipes or various sorts of things that people helped us scavenge. We would tell them what we might need to make something for a broken bone, a splint, or whatever, to help someone, and people would go scrounge around and find stuff for us. It was amazing. So, for me, Dr. Luba and I – as nightfall came, we had another doctor [that arrived in our area]. We started to have patients with chronic issues not necessarily related to their injuries but diabetics who needed their insulin. We really needed some better pain meds. Literally, all we had was what they called paracetamol over there, like acetaminophen. So, we really wanted to get some pain meds and some other medications that he had a list of. He knew where the nearest little hospital was. So, he recruited me to get on the back of his motorcycle and go with him to that little hospital. We took a list of names that people had been gathering again at that point – had grown tremendously, a lot of sheets of paper – and a list of medicines that we wanted. When we got to that hospital, that was the first time we realized how extensive the tsunami was and how it was everywhere in Thailand that we could tell. So, that very small hospital was completely overwhelmed. It was a horrible scene. There were people and bodies everywhere and bodily fluids all over the floor as you could barely walk without sliding. It was just a horrible scene. They were completely overwhelmed. But Luba was able to get some medicines. We were able to add our names list to the other names and the sign boards that were starting to develop at that point in time. I realized that all that time sitting on the motorcycle had gotten my leg injuries to tighten up, and I couldn't really walk anymore very well. We had decided once we got the meds, we would drop those off, and we were going to go back towards the beach and see if there were people who were so injured that they couldn't get to the area where we had been on the hill giving first aid. See if we could save anybody down there. But it was clear I was not going to be able to climb around debris in my state. So, he said, "Well, why don't you stay here? It's clear they could use plenty of help here." So, that's what I did. That was the point where my story transitions. I start helping some people there, in particular a couple of teenage boys, one of whom had been in a serious car accident and had some pins and hardware put in his neck a few weeks before going to Thailand, still recovering from that. Then had a very similar experience to my own, of being in the water and tossed around. He was very, very injured and very out of it. The doctors there decided he was one of the ones who really needed to be evacuated to a higher level of care. So, I left the Khao Lak area that night in the back of a hospital [ambulance], translating for this boy, Jai Breisch, who was from Utah, to get him to a hospital in Phuket, where I spent my first night. That's sort of maybe a good end of my day, my tsunami day. Then, as you may have heard, I was there a few more days, and Jai becomes a whole story, and some of the other kids and people that I helped become part of my story for those next few days. Then, I am able to go home after some great assistance from my Thai friend in Bangkok, after some airlines donated flights for us to get out of the Phuket area and to Bangkok. My friend helped me out tremendously, which I guess since this is a U.S. government thing, I can say the U.S. government was not as helpful, shall we say, as some of the other governments in Thailand at the time. We, of course, have a very legal-based system. So, the embassy is very much concerned about people suing them, even in these sorts of situations. So for me, they offered me a loan and a seven-page document to sign if I needed money. At the

time I came to Bangkok, I was with a Swedish boy who was like fifteen. We went to the Swedish table first, and there a gentleman just had a bunch of cash, gave him a bunch of money and said, "We've arranged for this particular place where you're going to be taken care of. We're going to get you there." For us Americans, it was another piece of paper with a list of the local hospital addresses. "Good luck. Let us know where you're at, and we'll …" They were great about helping inform my family. They got someone to the hospital that night and were able to make contact with my family, what turned out to be early the next morning. So, my family knew I was alive before they knew there was a tsunami, or at the same time, they learned there was a tsunami in the area where I was. So, I was grateful for that quirk of the time zones and the embassy helping out there. They were fantastic about that and other things. But some of the assistance we got, I was very glad to have my friend just take me to his house and loan me some money and get me some supplies that I needed before I could pay him back when I got home.

EA: Yes. That was incredible to hear. Clearly, it seems so many details are still so fresh with you twenty years later. You made me feel like I was almost there. No closer than I would have wanted to be, but I mean, it seems really right there at the surface for me. So, I want to ask you, do you want to take a little break for a couple of minutes before we go on? Or are you okay?

DM: No. I'm fine. I'm fine.

EA: Yes. You're used to repeating this story, I think.

DM: Yes. I told it in a variety of contexts. Having been a professor, one of the things I realized when I'd gone through some therapy during my divorce was that it was a very helpful process. So, I did that early on, and I realized that talking about it was helpful to me, personally. I realized it was something I could bring originally to helping people in the tsunami. When I got to the place where we were being evacuated, I met Jai's parents. I was the first person they had met who had actually seen their son. This was a couple of days later. I was able to tell them, "Yes. I've seen him. I know him. I know his story. He told me about his neck." "Okay. It's not a rumor. This guy really knows our kid." But he was lost. He had been evacuated to Bangkok. They didn't know where he had been sent. They couldn't find him for these couple of days, even, I think, almost another day after I met his parents. They were being followed around by a freelancer who was working for *People* magazine at the time, of all the weird media outlets to work for, but she was fantastic and super empathetic. My early experiences with the media in the hospital was they were trying to get us to say stuff while I was in the foyer of the hospital. I wasn't hurt enough to be admitted. But there were cots all over, and they came in with cameras in the middle of the night trying to get stories. People didn't want to be filmed in that condition. It was not a pleasant interaction with the media at that point. But I realized that my experience talking publicly could help under the right circumstances. Karen [Emmons], the *People* journalist, helped us with that. She helped the family out a lot with transportation. She knew Thailand, and I eventually started to talk publicly. They got in contact with me – some of the folks from the [Pacific] Tsunami Museum in Hawaii – and recruited me to participate in some of their outreach. There were survivors of previous tsunamis that worked with them, and I was able to learn a little bit about doing the right kind of outreach and messaging. A family friend of a friend was a member of the media and interviewed me when I got back to Ohio those few days later. It was the first time ever that all of the networks of that time – so, ABC, CBS, NBC, Fox,

and, I think, a couple of cables – simultaneously shared resources and did a fundraiser for multiple hours like that second week after and raised millions of dollars. Dan Rather was the headline leader of that, and they interviewed me for a couple of bits during that fundraiser. So, I started to do a variety of outreach to classrooms and all the other stuff. But it was always with this sort of like, here's how you can, one, recognize and avoid tsunamis and take the scientific background that I had into a positive message, not just be a victim. In the early days, it was really about those fundraisers. Jai's sister was killed. She was a really beautiful girl. They had been in *People Magazine*. They were following him around. ABC, *Good Morning America,* started following him around. They became quite famous and were given millions of dollars in donations by people around the world. They created this foundation in their daughter's memory [4Kali.org] that focused on the orphan children of Thailand and doing things for them. So, I became a board member of that. So, I was also helping to fundraise by talking about it as well. So, that became one of the ways that I process things for myself and felt like I was, I think, taking some control of this. I think a lot of us hate the word victim. Survivor is okay, but nobody wants to be a victim of anything, I think. For me, that was a way to turn it around and take charge. For a long time, early on, I was quite injured with my leg. They couldn't really figure out what the problem was. I wasn't very mobile, so I was kind of stuck at home. It was, again, horrible being in my head. So, even doing things like trying to find Caroline and being online – it was the first time that the internet was really used in a big disaster like that to help find survivors, communicate. For us to interact amongst ourselves, too, and heal was another aspect. My search for Caroline got picked up by the German media as part of a broader story they were doing about the internet. So, that became a little thing, and people started contacting me. It was really awful. There were all these messaging boards and people would post pictures either of their family or of people who worked in Thailand at the resorts, bartenders, whatever, "Did you see this person?" Asking those questions, especially when you start to identify yourself as staying at the Gerd Noi bungalows that I stayed at, or in that area and at that beach, people would look for that and ask you usually, very nicely, but it was very excruciating. You don't want to say yes or no unless you're really sure. But I saw lots and lots of people those days and trying to remember if that was the person – I was doing the same thing with a couple of other people as well that I run across. It was really difficult in those days. So, having some ability to do something positive was really important to me in the early days. I just got lucky and made some great contacts. These people at the museum, one of them was actually a professional. She was the tsunami and volcano advisor to the state of Hawaii Civil Defense. As a five-year-old, she had gotten involved because her family's home had been washed away by the 1946 tsunami in Hilo, Hawaii, and she had always wondered why people didn't talk about it. Going back that far, mental health was even more primitive, and especially it was a very Japanese American community in Hilo that was even more restrained. So, she and a professor at Hilo [Dr. Walter Dudley] were the guiding force behind that museum. But she had turned it into a profession in her later life at least as a disaster response specialist. She's always worked a lot with NOAA in the National Tsunami Hazard Mitigation Program – Jeanne Johnston. So, she was just a great mentor in a lot of ways through all this and how to turn it into something positive.

EA: Yes. I imagine that's been part of who you are long before this. You talked about it actually happening at the time when you were doing your paramedic work. It was helping you and helping others, of course, keeping you busy and out of your head. As soon as you pause, it became more difficult emotionally. So, I mean, that has stuck all the way through. There was

something I wanted to ask you. I wanted to just go back and ask you your thoughts about NOAA's providing the emergency paramedic training for you way back when because you were so remote in Hawaii and how that really served you. I don't know. It almost reminded me of being in the military or something, just being so prepared. I guess I just wonder what your thoughts are about that kind of training. Does it still go on? Do other people get the opportunity for that kind of training at NOAA?

DM: It does in a variety of ways. At the time, we were using a contract vessel. So, the NOAA vessels, as you may know, the big ones typically have somebody from the Public Health Service on board, and there's actual medical facilities. So, we were using this contract vessel that was actually an oil spill response vessel but just had a lot of deck space to carry the debris. So, we didn't have those facilities or staffing. But they still put a lot of crews on the various atolls in the Northwestern Hawaiian Islands, basically for the summer, three, four, or five months at a time, depending on the location. Many of them are very remote, and there's only three or four people camping. I think a lot of those folks have always also gotten advanced first aid training depending on the need and the particular expeditions like that, where we don't have Public Health Service backup and are far from assistance. There's still a small group of folks that do that, and maybe other parts of NOAA that do other things in the Arctic or Antarctic also similarly have a need for that. But I think it was fantastic. It's a great opportunity. I'd done a little bit of those sorts of things over the years. But this was just the most authentic, detailed – we did this sort of customized course that they had been doing for a couple of years, just for our needs. It was fantastic. But there are these companies that do this for hikers. People go hiking in the backcountry, and there are opportunities for people to do this on their own. It's a great experience if you have the time and can afford it. I mean, I always like to have that knowledge and experience even in my life. I mean, I was a lifeguard as a teenager. There were various points, especially living out in the country like I did as a teenager, where we came across a runner who was on the ground one time. Just my mother and I driving along on a country road that doesn't get a lot of traffic. You come across those things sometimes even in your life, depending on where you live, and to be able to help out. I've always felt strongly about that in whatever scene, to get as much training as you can in first aid.

EA: Yes. That's a good way for me to also shift. I think I need to take us next into the progress that's been made over the last twenty years and what still needs to happen. But before I do that, this is what keeps occurring to me. I mean, there must be a lot of people that had referred to you and maybe still do as a hero. I don't know. Does that happen to you? People talk to you about being, yes, a hero because you really helped a lot of people that day.

DM: Yes. I mean, I think some people say it directly and others, maybe indirectly. I appreciate the thought. But, like I said, for me, even that day, it was really going into a comfort zone of having the training and knowing what to do about something. I didn't know how to be in a disaster zone and how to use my head as a survivor there. But I did know how to do first aid. I did know how to look at somebody's wounds, evaluate them, and think about what they needed to do. So, it really did take my mind off of it. We survived. I didn't run into a burning building. I just did what I had to do to be alive, I think, pretty much every step of the way. So, I don't quite see it the same way as somebody who chooses to do it. I just tried to make the best of a bad situation. I talk about that a lot. I think it's one of the ways that I think I've changed. I think

some of us changed early on. You become a little bit more of a daredevil even because you feel sort of invincible. But there's also this point where you, I think, realize that optimism is really important, and having the right attitude and the right frame. A lot of people, I think, more than the hero thing, talk about how you went through this horrible thing and how bad, how terrible it was. Yes. But I always turn it around to, like I was saying earlier, yes, but look at what all these people did. Not just me, but people stepped up and did what they needed to do. If they had language skills, they stepped up. If they couldn't do that, if they just wanted to help, they found food, they found water, they found pipes to use as first aid implements. Everybody was doing what they needed to do. Even with the first aid, people were respectful that there were only so many people who could help. They realized they were triaging. We were doing the people that needed the help first. We got to everybody eventually, and there wasn't chaos at that time. People were very understanding and respectful despite every trauma that they were in themselves. I thought that was pretty amazing. Maybe even more so now, when we see how we fight about silly, silly little things, now that I think we didn't even use to fight about twenty years ago, and how it is. We didn't care where people were from, what they were – it was just who's in the most need right now, let's see what we can do.

EA: Yes, that's really interesting.

DM: In the area where I was, David Attenborough and his family were there in the Khao Lak area. Another famous survivor was Petra Nemcova, the *Sports Illustrated* supermodel. She was very badly injured. She's stuck in a tree. She was between where I started and where I ended. So, we were very close. She eventually takes over the Breisch Family charity because she's famous and was able to sustain it for longer. She lost her fiancé. It was rich people, poor people. Unfortunately, the biggest victims of this were the Burmese migrant workers, who we learned later were a large part of the manual labor force, especially the construction that was going on in the area. Things in Burma, politically, were not good, and so they were restricted. Their families were restricted in coming to retrieve bodies. They didn't have immigrant status. But it didn't matter to us that day. Even those folks, they were there. So, it was everybody, and it was who needed what, and who could provide what, who could help. It mattered because language skills were fundamental for people to say what they needed and what was wrong.

EA: Well, so you're still an optimist, I assume.

DM: You try to be. I mean, we all have good days and bad days, right? But it's definitely changed from how it used to be, for sure.

EA: Yes. So, I knew very little. I shouldn't even say very little. I knew nothing about tsunamis at all. Then, I'd done little tiny bit of cursory reading before I talked to you. I've learned a tiny bit about the – now, I just forgot the name of it – the early warning system.

DM: The DART [Deep-ocean Assessment and Reporting of Tsunamis] System.

EA: DART, yeah. There's still a lot of work needed to be done, especially on the West Coast of the United States, right? So, I guess I just wanted to ask you about optimism, the progress that

you've seen, in terms of preventing something like this from happening again, so many people being killed. What are your thoughts about encouraging young people who are starting their careers? Any words of advice or encouragement for them? What else do you think is still needed?

DM: Yes. There's a bit there. I mean, in the early days, one of the people I met was a communications specialist. He was very critical, particularly of NOAA and the warning system at that time, because there wasn't a means to communicate with the media or the regular people. That was one of the reasons why so many people died. They wanted to get the word out, but the protocols at that time were really geared towards talking to other government-type people like themselves, working in emergency management. It didn't work fast enough to get the word out, and there was a lot of bureaucracy. Of everything, that's probably the biggest and best change now. You can subscribe to get email or text message notices now from the Tsunami Warning Centers, so you know if one's happened. If we would have had that and better smartphones that we all have now, so many more lives would have been saved. People had minutes to even an hour after the earthquake to evacuate, but we didn't know. The people that are just a few minutes away obviously need really quick warnings. But there's only so far away they can get to safety, and that's a little bit of a different situation. But that day, a lot of the deaths, many thousands of deaths, were people like us in Thailand that were an hour away from the earthquake. We all could have been saved. So, just that one set of changes makes a huge difference. But at that time, the DART system was just in its second generation of good sensors. There were only thirty-some. Now, we have over seventy DART sensors, and they're much more instantaneous. That system might need a few more sensors, but the sensor technology is as good as it kind of almost needs to be, if you will. That's not really the problem anymore. They still have areas they have to map. It's still a very complicated process to predict how big a wave is going to be in a certain area. Generally, they're really good now at mapping open coastlines. But there are still areas like bays and harbors where it's very complex. The ability to model depends a lot on very specific knowledge of the wave itself, exactly where it's coming from, and the bottom topography. It's very complex, and it can be very long-lasting. I don't know if you've seen the news stories, but we know from recent history this tsunami that I was in and Japan had a couple that were earthquake generated tsunamis. But if you were following the news a couple of weeks ago, there was a landslide-generated tsunami that lasted for nine days, and it created a 650-foot-high wave. Those landslide tsunamis are often very small and in very restricted areas. Nevertheless, they are enormous things that just wipe everything in the area off. But this thing also sloshed around for nine days in this narrow valley fjord-type environment that even had the scientists very surprised and amazed. It was apparently, from what I've read, generated and related to climate change in the fact that it's warmer, the heat has been melting the glaciers. Because the glaciers have been melting, it's changing all of the material and sediment in the areas and causing these landslides. Because the ice that used to be there capping things off and holding it in place is now gone. So, now this material can fall into the ocean, and just like throwing a rock, it creates a wave. In these restricted areas, in some places, it causes really large, damaging waves. It's happened in Alaska a few times, maybe not related to climate change. So, there's still a lot more to learn – the complex math of those kinds of areas and the other sorts of things that they've seen that we still don't perfectly have the ability to model. Our tsunami was so enormous, even for an ocean as big as the Indian Ocean, the wave went all the way across, and then it bounced back, and it was still creating waves in this direction. So, there was a place

off the southern tip of India and Sri Lanka where the wave coming back that had gone off of the African coast and the European coast and was coming back hit a wave coming from Indonesia, an original wave, and created an extra high wave in a very limited spot. Again, it's super hard to predict without a lot of really complex computer modeling, but it caused a lot of deaths in a small area because it's so complicated. So, there is still some really important research to do. Interestingly, later in my career, working at headquarters in NOAA, I was doing permits for what's called Incidental Harassment of Marine Mammals. That usually involves things that create loud sounds, military and construction sounds. One of the sources of sound is actually researchers. One of the ways that you study the source of the earthquakes is by going out and sending really loud sounds down. They travel into the rock, and they bounce off of different types of rock and sand differently. Hard rock versus soft sand, obviously, something – anything bouncing off of them is different, whether it's a ball or a sound. You can use those sounds to map what's underneath the surface. We did a number of permits for those kinds of activities around the world. But the one that most people in the U.S. are concerned about is off of the Pacific Northwest Coast and what we call the Cascadia fault. Over the past few years, NOAA and NSF [National Science Foundation] funded researchers have been doing ever more sophisticated and detailed studies of those fault areas to better predict when and how an earthquake might happen that would generate this really, really large tsunami that they've been worried about. Because it's been five hundred years since the last time that area had a lot of activity. So, that's another area where the science is still very good. But they just need to go out and study all, as they call it, the Ring of Fire, the entirety, almost of the Rim of the Pacific Ocean in particular, that we most worry about. But there's also risks in – Puerto Rico and the Virgin Islands have had tsunamis off of faults that are in those areas. So, there's a lot of places that need studying. There's still work to be done in those areas. So, lots of things for young researchers who are interested in this or just emergency management. I got to work with a variety of state emergency management groups. I've been a bit of a, again, sort of like this, a bit of a spokesperson for the [NOAA] Tsunami Hazard Mitigation Program at different times, being able to talk science in having seen a big tsunami firsthand with emergency preparedness people in the work that they do. We've gotten on that and different areas in the West Coast that are at risk, where they have, again, very little time to get away, to move important facilities like schools and hospitals over time, to safer areas in places where they can't do that to build very strong towers or functions of buildings where the building is made to resist a tsunami wave with better building codes and explicitly has roof areas or some safe areas where people can go up the stairs and get to hopefully a safe elevation to avoid the waves. The Thai government has added those in a few places as well, where there's nowhere to escape, like parts of Khao Lak. As I said, it's very hilly. So, if you can get to the hills, yes, but it's a little ways. It takes a while to get up a hill. There are other areas, though, that are very flat where the wave went two or three miles inland, and there's just nowhere to escape in those. So, building schools with second or third-story, very secure evacuation areas is really helpful.

EA: For the areas where you could run to safety or walk to safety, do you feel that there's enough public education out there for people to know what to do? I think I read about – maybe they're called walk drills or something. It's like a fire drill, but it's practicing what to do.

DM: Yes. I think a number of communities in Oregon and Washington, in particular, are very proactive. They've got some really fantastic people and very forward-thinking politicians. I

think in government, the people who sometimes downplay this, sometimes because there's a lot of tourism dollars at play, and they're less open to this. Others are fantastic about exactly that kind of training. So, it depends. There are definitely some areas that certainly need it. Hawaii, at the time, each island is basically a county government. So, the county that is Hilo, that's had a couple of tsunamis over the years, had a civil defense director who became the mayor, very proactive in a lot of these sorts of things – the appropriate mapping education versus some of the work we did in Oahu. There's a quirk of history where the early tsunamis that affected Hawaii all came from Alaska, North America earthquakes. So, when they created the first evacuation maps, they said, "Well, that's where the dangerous waves are coming from. Let's map for that. But let's say that the likelihood of an earthquake in the South Pacific is smaller." Two important things about that. One, it's just like investing money; past performance does not indicate future likelihood. In fact, it's almost the opposite, right? Because if you've had earthquakes in an area, that relieves the stress, and if you haven't, that means the stress is building up. At some point, you will need to relieve that stress with an earthquake. So, what they did was arbitrarily cut in half the depth of the evacuation zone. A skeptic would say the one of the reasons for that is waves that are coming from North America, Alaska, Russia, and Japan towards Hawaii hit the North Coast. If you know anything about where all the tourists spend their time in Hawaii, it's around Waikiki, which is on the other coast. We get waves coming from that direction, most directly. So, it had the effect of having a smaller evacuation zone, the effect of saying that Waikiki itself was not in the evacuation zone. Even the giant hotels that are a hundred feet from the beach in Waikiki were not in the evacuation zone. I actually had some skills in GIS [Geographic Information System], sort of unrelated to any of that. But as I got onto that committee, there was one faction that really thought that was an absurd outcome and that that needed to change immediately. I sort of sided with that faction and helped them create some maps to show what the real zones likely would be that would make them equivalent to what they were doing on the other side of the island. But that was, by that point, a very difficult political issue because it affects tourism. It affects insurance and insurance rates. Because if you're in a flood zone, I mean, they're related to the other kinds of flood insurance that you can have from streams or rivers, from rains, and we're seeing those issues with climate change. That costs the people who own those properties money to be able to insure them. But for people who are tourists there, they want to have a real sense of what's the likelihood of being in danger, and not telling them that this single map that shows the island was created with two very different assumptions, depending on which part of the island you're on would seem like a relevant fact that you might want to know as a tourist, that this other one is not as conservative as the one on the north side of the island. But that was the reality of these kinds of issues with natural disasters that NOAA, as a federal agency, doesn't have control over what a particular state is going to do or a particular county. Even in this case, in Hawaii, it was really the county level of government that was less interested in advertising those things than Hilo, which was very willing to say, "Look, this is what it is." We stopped building in our area that was destroyed by tsunami, where people used to live. It's a park now. That's what they did.

EA: Well, especially as someone who actually personally experienced this, how do you deal with all the – I'm assuming, there's frustration. How do you, I guess, thread that needle and deal with that, but yet keep going and staying optimistic and all that?

DM: Yes. I mean, I think at the end of the day, to me, like a scientist, it's about at least being

transparent. Everybody needs to know what the facts are. People decide to be in or build in a particular area; that's fine if you're able to objectively assess the risks. I think, with the tsunami, one of the things that I always come back to is there's always lots of talk about politics and government and what you want your taxes to be spent for. But there are a few fundamental things that only government can do, and this is one of those things. There was a point where they were creating the second generation of DART buoys, but they were having a hard time doing that. It took a long time to get there. They weren't able to put in as many as the emergency managers and scientists at NOAA wanted because there hadn't been a tsunami in quite a long time, basically since the ’60s, affecting U.S. territory. So, the Indian Ocean tsunami here created a huge interest in that. There was a lot of money. New things happened. Thailand – the same way. But then, as time goes on in Thailand, people stole batteries out of the DARTs. They stole batteries out of the warning towers. Things weren't being maintained. You have those cycles of the latest disaster, and remembering that, and keeping that in the budget and in the discussions. So, it always takes that. But to me, it's fundamentally something that only a government can have a warning system, can have these kind of buoys spread out hundreds of miles from the coast and do that. We should expect those kinds of things first, that only they can do, and then figure out what the states do and what other people do for these other issues. But at the end of the day, just always being transparent. So, I've tried to help out where I could on the outreach. But also, it's been interesting working for NOAA because there are points in time, like with some of these issues we're just talking about, where we were gently criticizing some level of government or another. We gently criticize NOAA about decisions about where to put the research vessels. There were some concerns about the safety of Pearl Harbor from tsunamis and putting more vessels there and Newport, Oregon, where they moved some vessels from Seattle, with a new contract for some of the NOAA vessels. There was also some concern that that's a pretty high-risk tsunami location with a very unpredictable Harbor that would be hard to do. But they put in some of those towers in Newport as one way to help with potential evacuations. If something were to happen in Newport, there's some evacuation space now that's close by. So, I literally have a little bit threaded that needle and worried about what it would do to my career. Fortunately, I was mostly working in the Fisheries service and not for the tsunami hazard program or some of the other parts, the PMEL [Pacific Marine Environmental Laboratory] lab that does a lot of the research on tsunamis in the Pacific Northwest. But it's tricky. If you're not aware of this, since you're talking to other people, NOAA created a new headquarters in Pearl Harbor and got some of the land on Ford Island. They had a little bit of facilities before, and they moved everybody there. Well, some of the workers at the Tsunami Warning Center – their facility was on a hilltop, very safe from tsunamis. They thought that was important that they be safe from tsunamis if they're out there giving warnings. But they were ordered to move into this island in Pearl Harbor. Many of them, very vocally, thought that was a very bad idea to put the warning center on an island in Pearl Harbor and risk their careers as well in raising those issues. There was some modeling done. There were some interesting outcomes for that. They said it wasn't going to be a risk. If you believe the model, that's good for Pearl Harbor. But it was really fantastic for the discussion we just had about Waikiki because while the model showed where they were going to put the NOAA vessels in Pearl Harbor was safe; it definitely showed that Waikiki was not safe. So, if you will, NOAA itself, trying to justify using Pearl Harbor, stuck its own feet into the issue with Hawaii because they weren't really looking at their model. They were looking over here by Pearl Harbor, and Waikiki is just a little bit to the right. They didn't really care about that because they were fighting this battle with their staff about where to

put the warning center. But I was really interested in the Waikiki question, as we just talked about, for the mapping. I said, "Well, yes. But look what it means for Waikiki. Thank you very much for creating this great model. Now, what are we going to do about Waikiki? Because you just showed that the entire area of Waikiki is now going to be underwater. What should we do?" That was a tricky thing for them to get involved in. But sometimes, even those unintended consequences happen.

EA: What was the outcome?

DM: Well, I mean, these things are always ongoing, right, and evolving. But, yes, let's say, I mean, Oahu is still not fond of thinking about the risks. But that's true for other things, too, even prior to that. To get off-topic a little bit, we wanted to do some PSAs [public service announcements] about humpback whale safety and safety around endangered animals in Hawaii. Most of the global governments weren't interested, but some were. The airlines were definitely not interested. Even though they've occasionally done certain sorts of PSAs, like little videos as you're landing kind of thing, like when people have nothing else to do. But that was one they didn't want to warn people about. Not only helping animals, but they're big animals. They can hurt people, too. People sometimes do silly things like trying to hug them or ride them, or other things that get them slapped by dolphins and whales and things like that or bit by turtles. But they saw it as a risk to their bottom line. So, you try to find other avenues for those messages.

EA: I don't want to keep you too long. But I do have one or two other things I wanted to ask you. Is that okay?

DM: Sure. I don't have anything jumping into my inbox.

EA: Okay. Well, one thing is, after what you just said, I'm thinking – I'm not a scientist. So, you reminded me that you're a scientist and your approach is you're doing the science. So, the things that might really frustrate someone else, I'm sure they frustrate you, but you continue on with your work. I'd like to know a little more about what you do at Fisheries now. But I was reading this article, I forgot his name, a photographer who wrote an article about you.

DM: Kerry?

EA: Yes.

DM: Kerry Tremain. Yeah. He was trying to write a book at one point.

EA: Yes. I found it very well written. I don't know how you liked it. But the thing that I liked that resonated with what I read was just talking about how many people, to deal with trauma, turn to helping other people and a variety of things. Then he framed what you've done now also is your helping others has gone toward helping the environment and helping animals and the fan coral. That was just interesting to me to think of it that way. That's still helping you continue on through your processing of having lived through something like that. It isn't just about helping people; it's helping animals and the sea.

DM: Yes. That's a whole other aspect we didn't really talk about much. But based on my prior experiences, when I started graduate school, a hurricane destroyed my advisor's research, and we went in in the aftermath and had some experience of what that was like and environmental damage. In Hawaii, we had done some work with shipwreck responses. There's liability when ships or oil gets into the water. We'd done some work restoring corals in Hawaii before the tsunami. So, I had that expertise and knew that that would be a problem in all the areas afterward. But I was able to go back to Thailand a couple of times and do the sea fan restoration. The corals in the sea fans were in the same park where I had gone for my little three-day vacation. The corals were in another couple of places. The debris was in two or three places. We taught them how to safely remove debris. When we worked in the Northwestern Hawaiian Islands, we were taught how to deal with shipwrecks, historical things that we would find there, which we did. But also, the military has used that as a testing ground and bases since before World War II. We were always taught how to identify and respond to ship mines, missiles, bombs, other sorts of things. Just south of Khao Lak, there was a Navy base that was destroyed by the tsunami. So, it wasn't unlikely that there was dangerous stuff that had washed into the Khao Lak area, as well as I was talking about, the propane gas tanks and other sorts of dangerous chemicals. People want help and go in, but it's not just like picking up trash on the beach kind of thing. Sometimes, there can be really, seriously dangerous stuff. I had a graduate school friend – part of the story is – the theme is apparently ecology has a lot of bad luck. There was a coral reef conference many years ago. I wasn't going to it, but I think it was in Australia. There was a group of, I think, maybe thirty people from that conference were on a plane in Taiwan that very famously, in a storm, crashed on takeoff, and about half of the people died, including some of the scientists. But my friend and colleague, who we had been in Oregon together, was a survivor of that, and it had traumatized her. She never had gone back to Asia afterward. But fortuitously, she also ran her own environmental nonprofit, more of a consulting nonprofit. Her husband was a tree plant specialist. So, they did stuff with endangered plots of land, and she did ocean stuff and planning for different things. When this happened, she opened up her charity, which had 501(c)(3) status, immediately to accept donations for environmental work. She graciously let me participate and do some of the Thailand work. She went to Indonesia, Sri Lanka, and a couple of other places. We used some of that donation money to buy supplies, these giant buoyant airbags to lift heavy debris, to get it out of the ocean, and all the accouterments to go with that, and the specialized epoxy glues that you reattach some of these corals and sea fans with. We bought a bunch of that material and just our expertise. She, for the first time since – it was fifteen years for her since this had happened – she traveled to Asia by plane. It was a healing thing for her in a number of ways as well, especially because her plane crash was related to our work in some way as well because she wouldn't have been there except for being in a conference. I was able to go back twice in the first year and help out on those projects, and have done various things since then to help out as well. NOAA was one of the agencies under Secretary Clinton that participated in this thing called the Civilian Response Corps that the State Department created to use the expertise of federal employees to help in both natural disaster zones, but a lot of the effort in those years was going to Iraq and Pakistan and the Middle East where all the fighting was, but to use various experts. Being in the Department of Commerce the training that we got, I worked with people from the Census Bureau who ended up going over there to help those countries create a census. They'd never done a census of their people before, surveying their people and that sort of thing. We have Weather Service people who have these portable shipping container weather stations that they can send to a fire. They sent them to Haiti after the

earthquakes in Haiti. Some of the guys went there for that. I worked on the Deepwater Horizon oil spill and used some of the training after the tsunami. I took a lot of FEMA [Federal Emergency Management Agency] training as well and disaster response to really learn how to be a professional disaster response person after some of these experiences. So, I had that training. NOAA needed people all of a sudden after Deepwater Horizon. We only had a very few people that had that experience. There's a small group that does oil spill response for NOAA. But this was on a scale far beyond and a duration far beyond their capacity. I spent months working on that with NOAA's blessing. Part of the time, I was in Alabama, on site. Part of the time, I was just in headquarters in their command center, just doing whatever needed to be done, basically.

EA: Fascinating.

DM: I mean, I've always had a little bit of interest in that. But the tsunami, really – I've tried to find as many opportunities as I could. I was the first person from NOAA to serve in a program that Homeland Security created. Again, after Katrina, a lot of feds were roped into helping out after Katrina, but there was no sort of formal program. They just sort of took volunteers who different agencies could spare, and they did whatever needed to be done in the South after Katrina. After that, they created a more formal program. I was the first person from NOAA who was ever deployed under that. After 2017, it was the first time they took people who didn't work for a DHS [Department of Homeland Security] agency. Because they had all those hurricanes – there were the ones that hit Texas and Florida, then, at the end of the summer in 2017, it was Hurricane Maria that hit and just went through the entirety of Puerto Rico. I speak Spanish from my time in Panama relatively well and was able to serve a tour of duty in Puerto Rico after the hurricanes hit there. A couple of weeks after. I was in Puerto Rico, again, helping, but having some background and knowledge from these other experiences. That's been really helpful as part of my recovery. Again, long term, the other thing that I haven't mentioned, I think, and it's motivated me more recently, was Jai, this little boy. He was sixteen at the time. He was really close to his sister. With his injuries, he, in the ensuing years, got addicted to pain meds, opiates. Eventually, beat that. He'd had a promising musical career, and between his injuries and being out of it for a while, that never got back to where he was. He found other things to do. But long story short, a little over a year ago, he committed suicide directly as a result of his struggles with the loss of his sister and the trauma that he went through. So, it's always been interesting. I mean, in the early years, I was doing a lot of work and talking. Then, it became clear. Now we're going to do something at the five-year anniversary. I did some talks for the library. Then, the ten-year anniversary, there was another bout of interest in documentaries and new technology and discussions. Then, a lot of other disasters have happened. It's sort of always surprising me that there's been, again, in this year, I've done, actually, quite a lot of things of various sorts, documentaries and stuff. Again, twenty years later, it's really surprising me that people are still coming back to this event after so many other events have happened. But I've talked a bit more about – in some of those – the long-term mental health effects, particularly Jai's loss really affected me.

EA: Yes. I'm really sorry. I'm so sorry to hear that. That’s terrible. Yes. Well, I happen to be a social worker. So, I have to be careful not to start trying to have a therapy session here. I was just wondering if you still get some support for yourself besides NOAA on all the work you do. Because you've brought up mental health pretty openly, which I think is terrific. You still get

that taken care of for yourself.

DM: I do. I check in. I had this great therapist when I was in Hawaii because I mentioned related to my divorce. So, I contacted him right away and asked for advice. I was on a different island at the time. He was fantastic. He put me in contact with a PTSD [Post-Traumatic Stress Disorder] expert on one of the military hospitals in Oahu. So, somebody, you know, dealing with a lot of folks who had battle trauma in serious ways. That was really helpful. People remember the story. They don't have a lot of patients like me. So, that's been somewhat of an advantage, I guess, to me, and that I've been able to maintain some connections with people like that. They just remember the story because it's not something they had every day. So, I think they're intellectually curious as scientists or therapists themselves about something that they don't see every day either. So, yes, I've got a network. Other survivors and other people that worked – I mean, there's things I told therapists because I knew I needed to, but there's nothing like talking to other people who went through it. Caroline has never been very interested in talking much about it. She told me recently that she still hasn't told her ten, twelve-year-old kids about any of it. Somehow, they've not found it yet on social media or anything that their mother was a survivor. But I visited her in Germany early on, and she came to Thailand a couple of times as well. But when we went to Germany, we visited another family – two of the four people in the family I had treated with first aid, the little boy at the very beginning. She didn't know them, but they were both German. So, obviously, they could communicate in German. It was the first time she had really opened up. German stereotype, not a lot of interest in therapy there – whatever. But for her, it was, I think, really cathartic, and it really helped her start to open up. She's always been open with me. But to have other survivors that could relate to what it was like because even a lot of the professionals really couldn't relate. It's just something nobody had seen before as much as they had dealt with people who'd been in battle or whatever. Even very significant traumas like ours were hard to even understand the context of what we've been through in a variety of ways for anyone. I think she found that really, really cathartic. We had conversations about stuff that I don't talk about with other people.

EA: Yes. I think it's really important that as a scientist and someone who's doing this work and sharing your story and talking about all the scientific aspects and all the kind of adventurous or just interesting dramatic story. You're also open and just open about addressing that there is a mental health issue as well, just like there's broken legs and physical trauma, the emotional trauma. I'm glad you do that and share that with your colleagues and the world, too.

DM: Yes. That certainly wasn't a conscious – I mean, again, going back twenty years ago, most media were very ephemeral. Then, it started to gain a life online. I realized there were actually a lot of fairly personal details there. As much as I decided that I could tell my story, and that being someone who was comfortable in front of a group and speaking and lecturing, it never occurred to me that it wasn't ephemeral. That it was going to actually stay online like all that online stuff was so new. That part I only realized later, after it was somewhat too late. I mean, I don't mind, but I realized that was part of it now, that I hadn't ever really contemplated because it was so new. I just thought I was talking to a group of kids, and then they would remember that, but it wasn't there for everybody to find. Now it's interesting sometimes because people look you up if new, if you're dating. It's a weird thing that I know sometimes I sense people, sometimes have seen things, but they don't want to talk about it, but they're looking aside at me in a strange way,

or whatever. I've come to terms with it. I think it's helpful to people. As I said, ultimately, it's been helpful to me. So, it is what it is, I guess, at this point.

EA: Is there anything else that I didn't ask you about that you were hoping to talk about, that we could either talk about now or we could schedule another time?

DM: No. Like I said, there are so many different lines that ultimately trace back to the tsunami of different things that I've been involved in. I'm certainly happy to talk more. I think I've at least given you a little hint that they exist. But whatever you guys are interested in for your project, I think I've hinted at a few other folks. Again, I don't know the scope of other people you're talking to, but the folks from the warning center and the other folks who were involved at the time in their own way for professional reasons. Obviously, many of them got involved in any way they could. I mean, I think a lot of the, you know, the warning center, people that I talked to were just devastated that they weren't able to find the right contacts at the time to spread the word more quickly. NOAA was very sensitive about it for a long time, that criticism. So, those guys did that also underground, to some extent, to protect their own careers. But they're obviously interested in tsunamis, and many of them helped out in that.

EA: That was something I was going to ask you: who would you recommend we try to talk to?

DM: Gosh, it's been a long time since I've interacted with many of those folks. Let me get back to you and see what I can find out about people, like who's doing what now.

EA: I'm just a freelancer with a couple of interviews. Vasily [Titov].

DM: One of the researchersat PMEL, yeah.

EA: He's the only other person right now that I have on my list.

DM: Yeah, he did a lot of this modeling that I was talking about. I haven't interacted with him in years. So, is he still at the center? I know he's not that old.

EA: I think so.

DM: I would imagine he's still there, yes. Eddie Bernard.

EA: He's been interviewed.

DM: He's up there in age now at this point.

EA: It was a big, long oral history interview that he did a couple of years ago.

DM: Jeanne, I don't know what her – I think she was at least a contractor. She's been a FEMA person for a long time, but she was, I think, a contractor, at least for the National Tsunami Hazard Mitigation Program. This is the woman who survived the 1946 tsunami. She's elderly but still active.

EA: You have her last name?

DM: Jeanne Johnston. I can give you her email. It doesn't pop up immediately because I haven't emailed her for a while …

EA: I don't know if they only want NOAA employees for these interviews. I'm not sure. But if not, would you want to contact her first to make sure it's okay?

DM: I'd be happy to. I'm sure she would be more than happy to give an interview. I mean, she's sort of got the same philosophy as myself. She was involved in setting up their own recordings for the [Pacific Tsunami] museum's archives. So, she knows all about doing oral histories and the importance and value and stuff. So, I'm sure she wouldn't – but yes, I need to connect with her because it's been a while anyway. So, I'd be more than happy to do that and mention that you might be contacting her if you guys decide.

EA: Thank you.

DM: She had a period where she would connect. She's worked a lot with the Tsunami Hazard Mitigation Program from both sides of the coin as a state employee and from their side. Because, at one point, the state let her go. I think they were not happy with her advocacy on behalf of disasters at one point in Hawaii, the political government there. So, that's when she started working for NOAA. Then, I think she's hooked up pretty extensively with FEMA since.

EA: Okay. So, what's your official title now at NOAA?

DM: Two and a half years ago, I moved from NOAA to the National Science Foundation. So, I spent from 2006 as a fed. I moved from Hawaii in 2006 to D.C. to 2022 in the National Marine Fisheries Service, where I was working on endangered species, various aspects of that. Since then, I have worked for the National Science Foundation, which gave me a fellowship to go to graduate school. So, I was always grateful for that financial support because I'm also from a very middle-class background. So, my title now is investigative scientist.

EA: Okay. All right. Well, thank you. I really appreciate you spending all this time and all the work you've done over the years. Yes. If you do think of anything else that comes to you and you decide, like, "Oh, we should talk about this," you know how to reach me. I'll do the same. I'll go back and look over this, and I'll let you know if I want to have another conversation and explore some areas again.

DM: Sure. So, it sounds like you're doing a special group of interviews related to tsunamis and partly recognizing the twentieth anniversary. Are there other themed projects that the oral history Voices have done? I've seen some individual interviews at various points in time that people have pointed me to. But I'm not aware of bigger projects like this.

EA: I'm not sure. A couple of years ago, or about a year ago, they were trying to pull something together for PMEL. We were going to do a bunch of interviews around that, and it didn't

happen. I'm not exactly sure why. So, I can ask the woman –

DM: I'm just curious. I mean, I didn't actually take the time. I'm looking at the Oral History Archives now to do that. I've forgotten to do that in preparation for this. I've been busy. Okay. So, there's different sorts of themes and stories. Because I've definitely listened to a few, but things that people had highlighted or sent me to. I haven't gone in by theme.

EA: Now you're getting me curious.

DM: Nice. Yes. It's pretty extensive. That's nice. Yes, I ended up making friends. I don't know if you ever heard of Captain Theberge, Skip, who was a librarian and who ran the Central Library. He started a speaker series. But he was a ship captain for NOAA, and then he retired to become a librarian for NOAA, and he was a real history buff. So, he had all the special collections for the library, but he also created a photo library that NOAA has if you've run across that photo library to illustrate anything. I gave my first tsunami talk. I don't know how we hooked up. Somebody let them know I was a survivor. He got me in, and I did four or five talks for him over the years. He created this photo library. This reminds me very much of the photo library, with a lot of different themes and things. He was mining the wealth of NOAA experts for photographs of their work and saving them for posterity. So, it was a great project, and I donated a bunch of stuff.

EA: I wonder if they could be found. I did ask the woman who has been working with Voices. Her name is Molly Graham. She's an archivist and an oral historian.

DM: Yes. The photo library still exists. It's still a thing through the library's part of the website. Skip just retired, but he was a wealth of knowledge about all things NOAA because I think he had spent forty-five years working for the agency and a lot in his later years on historical stuff. I'm sure they could have done ten hours of interviews with Skip.

EA: Yes.

DM: No, this is great.

EA: All right. Thank you so much. What will happen is this will get transcribed, and then we'll send you back the transcription and the recording. If you want to, you can go through the transcript. You can go through it and listen to the recording, or you could just read it. Just make sure you don't see any glaring errors or mistakes or anything that you want redacted. I hope not.

DM: Sure.

EA: Then I'll get your final approval for that transcript and the whole thing. Well, what's nice about oral history – I mean, like in your case, with such an incredible story of that day, it won't be edited. You have to find someone who wants to spend two hours listening, but it's all there. It's possible that someone also may take little snippets out to make things for people to listen to. But all the details that you brought to life when you were describing the story that'll all be available for anyone who wants to listen.

DM: I mean, I've had experience where, I think, from the museum one, too, where different programs have gotten access to portions of interviews, and they've used them in documentaries and that sort of thing. I assume these are also publicly usable in that way. It was one of the things about the photo library is NOAA doesn't put copyrights on the stuff in the photo library, so a lot of people from all walks of life use the material. I mean, I had a woman contact me. She actually asked me permission, but she wanted to take a photograph that was in the library and create a piece of art from it, like a physical piece of art, not just a painting off of it and stuff. So, I've had some really interesting interactions from just the photographs I've donated with people that have done things with them in ways that I might have made a few bucks off of, but I appreciate the fact that they get wide use. It means more people take advantage and do stuff with them and do some interesting things. It's been enjoyable to hear about.

EA: Well, if you're real curious, go back and read that release that you signed. You hold the copyright.

DM: Okay. Yes.

EA: Now, this hasn't come up before, but if you wanted to pick a photo or two that you want me to connect to this interview, feel free to send it. I'm sure we could somehow connect it.

DM: Yes. I mean, that's up to you guys. If you Google me, there's a couple of me in my yellow T-shirt that somebody donated that the woman from *People* Magazine took that are the only pictures of me at the time that show some of my injuries and stuff. Actually, I think one of them is used in one of the things I sent you a link of. That's one that I've often used. I've only got three or four, plus the one that the government took these ones for us. It felt like I was a criminal.

EA: That's what it looks like, a mug shot.

DM: A mug shot that they use because I lost my passport and visa. They stuck that to a piece of paper that had a stamp on it. That was our travel documents until we got squared away through the embassies. That's what they did with those.

EA: I wanted to ask you. You mentioned that you were given a baseball hat, I think, or a hat. Do you still keep that hat?

DM: Well, there's a story. Yes, the hat has a story, but a very different story. So, the little boy, the little German boy that I took care of, was my first patient that had the really serious pneumothorax in his lungs – collapsed lung. He was always my most important patient because he was so cute. He was one of the most severely injured that survived. But he asked me for that hat that day after we got him settled. When I went back to Germany and visited his family, I brought him the hat. Yes. Even more interesting, I treated him and his mother. His mother had really bad injuries on her ears. Most lucky family I know. Side story: Paul was older. His little brother was one and a half, barely walking, disappeared for a day, pulled out of his father's arms, found walking on a street without a scratch on him. The father's name is Ben List. Two years

ago, two or three years ago, Ben won the Nobel Prize in Chemistry. So, yes, another scientist. Of course, you can't win a Nobel Prize unless you're alive. Luckiest family I know. I don't know anybody else who all survived in a family of four.

EA: Incredible.

DM: Any other survivors that I've met, they're the only ones that everyone survived. They were right across the street from where I was, also in a small resort. So, yes, that's the story of the hat.

EA: I should have asked you that sooner.

DM: I don't know. It's another good question. I don't know if Paul still has the hat or not.

EA: Thank you for sharing that with me.

DM: Yes.

EA: Okay. I think we're going to sign off unless you have more things for me.

DM: All right. Thanks.

EA: All right. It's wonderful to meet you.

DM: Nice to meet you. Take care.

EA: Bye-bye.

----------END OF INTERVIEW----------

Reviewed by Molly A. Graham - February 20, 2025
Reviewed by Dwayne Meadows - February 21, 2025
Reviewed by Molly A. Graham - February 23, 2025