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AN INTERVIEW WITH LOUISA KOCH  
FOR THE  
NOAA 50th ORAL HISTORY PROJECT

INTERVIEW CONDUCTED BY  
MOLLY GRAHAM

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TRANSCRIPT BY  
MOLLY GRAHAM

Molly Graham: This is an oral history interview with Louisa Koch for the NOAA 50<sup>th</sup> Oral History Project. The interviewer is Molly Graham. Today's date is December 4, 2020. It's a remote interview with Louisa in Silver Spring, Maryland. I'm in Scarborough, Maine. I like to start at the beginning, especially with you. You have such an interesting family history. But could you start by saying where and when you were born?

Louisa Koch: I was born in Boston, Massachusetts, in 1959.

MG: Tell me a little bit about your family history, starting on your father's side.

LK: My father was born and raised in St. Paul, Minnesota. His father died when he was very young, and he was hospitalized for failure to thrive. His mother was left with four children and a jumble of finances that she didn't really understand. So he really struggled. He was at a bad age for his father dying, and then he became very, very close to his brother. A few years later, his brother actually went into the Air Force and was shot down in World War II. So he had a lot of struggles growing up, and I think it helped him want to take care of people. He eventually became a doctor. His grandfather was from Holland; he was a bricklayer. He brought that trade with him to the US. We still have some connections to our cousins in Holland. There's even a castle that my family was connected to at one point, but that's no longer in the hands of our family. It's still a pretty cool place. On his mother's side, she was a long time, many generations American. My grandmother was Margaret Paine Koch. She descended from The Adams Family, both President [John] Adams and his son, [John Quincy Adams]. I think there's probably a distant connection also to the beer, the Sam Adams brewery because they feature John Adams and John Quincy Adams on that. Anyway, I've always felt a strong connection to America's past, and I love this country very much.

MG: When did you learn about this history, that you're a descendent of the Adams Family?

LK: Yes, it was something that my – genealogy has been a sport in my family. Both of my parents have had their lineage fairly well-documented. My cousin has done a lot on my mother's side. My grandfather, her father, did that before. Then, on my mother's side, my grandmother actually did a lot of it and my aunt. It's a pastime for members of my family, not me, but I'm a beneficiary.

MG: Was it your grandfather's generation that immigrated to the United States?

LK: Yes. He came over before he was married when he was a young boy.

MG: Can you say how he passed away?

LK: High blood pressure. I don't have a better diagnosis than that. He was in his, I think, late thirties, early forties. So a pretty young man.

MG: Can you help me make the connection? The Adams Family was based in Boston. How did the Kochs come to New England and the families come together?

LK: So my father went to medical school at Harvard Medical School, and he had actually come to go to school in Cambridge. He and a friend went out on a double date, and the double date included my mother. So that's how they met. His mother had actually come from Cambridge. So both my grandmothers came from Cambridge. She had moved to Minnesota. So it was very natural for him to come back.

MG: Did he have other relatives in the area?

LK: The only other relatives that I know – his brother, the one that lived, and his sister were not in the Boston area. I don't know of any relatives on my grandmother's side or my grandfather's side, really, except for our cousin, who stayed up in Minnesota. So yeah, I don't know of any. There might be.

MG: Tell me about the family history on your mother's side.

LK: My mother was also a longtime Bostonian. My grandfather ran a woven hose [hosiery] company. They were a manufacturer of socks and hose of various kinds. They were an early manufacturing family. During the Depression, that company closed. My grandfather actually struggled financially but eventually became a businessman in a different way and did okay. My grandmother was a stay-at-home mom and raised my mother and her sister.

MG: And you have four sisters? Is that correct?

LK: I have four sisters. No brothers.

MG: Tell me a little bit about what that was like growing up. Where in the order were you born?

LK: I'm the baby of the family. So I have four older sisters. For me, it's just such an amazing gift. They are my closest friends. The one thing I wish for my daughters is that they're close friends because my sisters are. Depending on the problem that I have, I'll pick which sister I want to talk to. They give me very different advice, but it's all good. I feel very lucky to have this family.

MG: What kind of doctor was your father?

LK: He was an OB-GYN [obstetrics and gynecology]. He actually became an OB-GYN before it was established as a medical profession. Then he became a certified OB-GYN when it actually became a certified profession. He invented a cervical cap, which was a form of birth control called the Koch cap, and did a lot of work to promote reproductive rights for women and reproductive health.

MG: That is so interesting. Was this in the era before the Women's Movement?

LK: It was along with the Women's Movement.

MG: I imagine your family would have very interesting conversations over the dinner table.

LK: Yes, and he was a great storyteller. We had a lot of debates and a lot of discussions about what was important in life and our obligation to make the world a better place.

MG: What about your mother? Was she involved in the movements, or were they aligned politically?

LK: I think they were aligned politically. Again, she was the director of a daycare center. So that took a lot of time and effort for her. He ended up asking her to relinquish her position because it was a lot of work. She had seven or eight educators on staff and fifty or sixty students and all the liability issues. I remember when I started working; I got my first job as a consultant for Booz Allen Hamilton, and I made more money than she did my first day on the job.

MG: Wow. Tell me a little bit about growing up in Brookline.

LK: Yes.

MG: I love that neighborhood.

LK: Yes. It was a great place to grow up, go to school. We used to walk to school. It was about a mile away. I was a fifth of five, so pretty much every teacher had had one of my siblings before I got there. We played outside a lot. It was the time when – lots of people talk about this – you were just encouraged to get on a bike or get on a bus and go where you needed to go. Parents didn't really worry about you. So I spent a lot of time venturing out by myself.  
[laughter]

MG: Tell me about where you would go. You have so many options in that area.

LK: Yes. Obviously, most of the time, I was going back and forth to school. Also, we had a club in the summertime, so I would go swimming at the club and sometimes go to play tennis. Then, when I got older, when I was in high school, my grandparents had a house up in New Hampshire. So we biked up to New Hampshire.

MG: You would bike from Boston to New Hampshire? Wow.

LK: We biked from Boston to New Hampshire. Yes, it was a good bike ride for teenagers.

MG: Would you go up Route One?

LK: We only did it once. I don't remember. I did it with a friend. But we took some other long way. We went down to Cape Cod, as well. We took some other long bike rides as we got bigger, and we just mapped out a low traffic route that was fairly direct.

MG: Tell me a little bit about the schools you attended, what subjects you liked, and teachers that stood out to you.

LK: Sure. I went to public school from kindergarten through high school. There was no middle school. So I went through K-8 and then nine through twelve. I was a good student. I enjoyed school and had lots of friends. I played the flute not well. In high school, I was pretty good at math. Actually, my favorite class for sure was outdoor education. The high school gym was actually a public facility, but we used it for high school. It was made out of brick, but every fifth brick had the corner out, and it was six stories high. One of our projects was climbing; it was early rock climbing. So they roped us in because the windows on the top floor opened out. I remember climbing up that brick wall and the sense of accomplishment – because I’m terrified of heights – when I climbed through that window. I can still see that window and climbing through that window. I was a big athlete. I was on the track team, the volleyball team, and the swim team.

MG: How were you thinking about your plans after high school? What did you want to go on to do?

LK: I was sort of on a conveyor belt. I applied to colleges. I got into college. I went to a college that an older sister had gone to, Middlebury College up in Vermont. It was perfect for me. It was lots of outdoors, good academics, good sciences. I didn’t really think about it. I didn’t question it. I had four older sisters. I just follow their – my mother said her philosophy for raising five kids was you get the oldest duckling headed in a direction, and the other ones just follow along, and I was definitely the littlest duckling.

MG: Did any of your older sisters go into the sciences?

LK: I have two sisters that are doctors. One sister is a hospital administrator. I got my undergraduate [degree] in physics and my master’s degree in electrical engineering. So I would say four out of the five of us have a strong health care/science focus. The fifth one was an accountant. So she was heavy into the math.

MG: Before I asked you about Middlebury College, is there anything I’m missing from growing up, especially with so many sisters?

LK: We were actually very well-connected as a family. We spent a lot of time with our cousins up in Vermont. We used to go there for holidays on a regular basis. So our families intermingled. I always felt like we were a family of seven, and we spent a lot of time as a family of seven, but we also were very well-connected to the rest of our family. We always said that because my father had no sons, he had to look to his daughters for leadership and for taking on all the chores. I used to say that my father had five daughters because he was hoping for a son. But my mother actually corrected me and said that what my father said was, “When you do something well, you should keep doing it,” which is a much kinder interpretation of my father than the one I ascribed to him.

MG: Well, tell me a little bit about your first year at Middlebury, your first impressions of the campus, and the classes you took. It’s such a pretty area.

LK: It is. So I walked in with my sister. She brought me up there, and she met a friend of hers, who they had graduated the year before. She's four years older than me. Her friend had a younger brother, who was a freshman, and we fell madly in love, and that was the primary focus of my first two years at Middlebury. So college is a time to experience life outside the home. So we did. I loved being outside. I loved the sunsets there, sometimes the sunrises, but not too often. I took long runs there. I cross-country skied there. I did a lot of hiking in the mountains, really enjoyed being outside. That boyfriend taught me how to kayak. We went all over the country kayaking. So I learned to read rivers. I learned to paddle. Actually, in my outdoor education class in high school, they had had us in kayaks in the swimming pool, and I had learned how to do a no paddle roll because I was already a very good swimmer, so I was very confident. With a no paddle roll, you just push your hands down, and it spins the kayak. So if you lose your paddle and you want to get up, you can still get up. So when I told my new boyfriend that I could do a no paddle roll – because his father was a kayaker. He used to kayak in the Potomac, and he had grown up as a very serious paddler – it was one of the things I scored points on early on is that I could do a no paddle roll. Anyway, we had a lot of fun. I really wasn't that focused on academics. I did okay, but I was much more interested in ultimate frisbee and kayaking.

MG: When you say you kayaked around the country, do you mean you'd go on road trips with the kayak on the back of the car?

LK: Yes. I mean, we did a lot of local paddling, and you almost always had to put the kayaks on the car. For spring breaks, we would go down to West Virginia, or North Carolina, South Carolina, Maryland. We did lots of paddling. Middlebury had – I don't know if it still has – a January term. I actually went down to Texas and had applied for and was selected for the Conservation Service Corps employee. So I was going to go work for the Park Service. I took the spring semester off my junior year. It turned out that they offered a winter term that year in Texas. So I went down, and I learned about the geology of the park, which was perfect because then I became a naturalist in the park, and I talked about the geology in the park. Then, after I finished up my semester as a Student Conservation Association volunteer, I became a raft guide in Texas. We had split up by that time, but the river stayed with me. Then I actually was a raft guide the following year out in California, and that company also did trips on the Grand Canyon. While we were still together, he was up in Idaho. So I got a job in Wyoming, and I paddled in Wyoming, and he paddled in Idaho. So I ended up paddling in a lot of different parts of the country.

MG: Do you have a favorite place that you paddled?

LK: In the Grand Canyon. Just spectacular. The side canyons are the best. Have you ever been to the Grand Canyon?

MG: I have not. But it's on my bucket list.

LKL Yes, just phenomenal. I don't know how you plan to go, but if you have the time to take a raft trip – I wasn't paying that much attention. I was just going along. I was excited about it, being there. But you drive, you park, you put the rafts together, and you start floating down.

You're just on a regular river. Then, as days go on and on, you notice the canyon walls getting steeper and steeper around you, and you're going a mile down into the canyon. But it's subtle because from one hour to the next, you're just in a slightly deeper canyon, barely noticeable. When you're way down in the bottom of that canyon, and it's fully around you, it's an unbelievable experience – the amount of time and the geological terms that you can feel down there. Then, the side canyons, some of them are like you arrived in Eden, just pristine and gorgeous and so welcoming. Just phenomenal environments.

MG: This was an era of a lot of environmental awareness and action. The Endangered Species Act and the Clean Water Act were passed in the 1970s. Was this something you were aware of?

LK: I was just living it. The truth is, I was a passionate environmentalist in terms of how I cared about the world, and I loved being outside. I was definitely an outdoors person. But I purposely did not do environmental work. I did not want to come to NOAA [National Oceanic and Atmospheric Administration] because I am a passionate person, and I didn't want my job to take over my life. So I actually worried about coming to NOAA because I was worried that I would not be able to – I wanted a family. I did not want to be consumed by my job. So I wasn't part of – I mean, with my parents, I'm sure I was out there protesting for things, but not really aware of it in my own right.

MG: These jobs that you're describing as a rafting guide and working for the –?

LK: Student Conservation Association.

MG: It sounds like it was good training for what you ultimately ended up doing in terms of engaging with the public and doing educational outreach.

LK: Yes, absolutely. When I actually came to NOAA, it felt really good when I made the decision to come. But I avoided it for a long time.

MG: That's interesting. Well, I guess we'll get into that in a little bit. But I wanted to know more about where this interest in physics came from. You majored in physics at Middlebury.

LK: I actually was an environmental science major. I really liked geology, but I knew that I didn't want to just do geology. So I was an environmental science major. Then, the physics department made me take so many physics [classes] because every school defines environmental science for itself. I'm like, "Screw this. Nobody knows what an environmental science major is, and I only have like two more credits to take to be a physics major. So I might as well be a physics major." I did my thesis on acoustical barriers for highways, keeping with that environmental theme. Yes. That's why I became a physics major.

MG: What about acoustical barriers were you writing about?

LK: These were how to design barriers for highways in populated areas to try and protect the surrounding community from the traffic noise.

MG: Interesting. What year did you graduate from Middlebury?

LK: I was supposed to graduate in '81, but because I had fooled around, I graduated in '82.

MG: What else about your college experience have I not asked you about?

LK: I don't know. I think I told you a lot about it.

MG: You graduated in '82, and there were a few years in between then and going back to school. So I'm curious how you spent those years.

LK: Yes. I graduated in '82, and I went to be a raft guide. I had a different boyfriend by that point, and he wanted to work in Washington. So I actually came back to Washington. That was the first professional job I got. I worked for Booz Allen Hamilton because we were living there together. I started going to grad school in engineering because it seemed to fit. I was doing acoustical work for Booz Allen Hamilton. So I was doing the engineering to go along with that.

MG: I'm curious about your Booz Allen experience. I've interviewed a lot of folks who are older than you, from an older generation, mostly World War II veterans who were employed there. They have described it as a little bit of a boys club, but also that there was a fairly rigorous application process. I was curious how things changed by the time you arrived.

LK: When I came into Washington, I had been a raft guide. I was trying to orient myself to a new city. I had a college degree but not a lot of other professional experience. I had not done professional internships; I had gone kayaking. I actually went to a job fair, and there was a woman there who was recruiting. I think, by this time, it was popular to try and attract women into the workforce. So Booz Allen was trying to change. The older staff were almost all white men. There were no minorities there, I don't think, basically at all, but they were definitely looking to hire women. This woman and I got into this conversation, and I told her I knew how to juggle because when you kayak, you juggle. It's just sort of what you do. I showed her I could juggle, and she liked me. So she handed my resume in. Maybe she liked the fact that I had a physics undergrad, and I was going to engineering school, but I think it was really the juggling that sealed the deal.

MG: Do you mean literal juggling?

LK: Yes, literal juggling. I think I did it with oranges that were on the table for the snacks at the job fair.

MG: It's funny that that's what maybe sealed the deal because in these other accounts with folks of an older generation, they described a really vigorous application process with lots of exams you had to take. No juggling.

LK: I have no recollection of – I remember chatting with her at that job fair and her taking my resume, and then getting a job offer. I don't remember any – maybe I filled out an application. That's not etched in my memories.



MG: Can you describe what your role was at Booz Allen Hamilton? I'm not sure what an acoustic acoustical engineer does.

LK: Well, we were all consultants. We were Booz Allen, and we were working on a Navy high-frequency improvement program. The idea was there are certain opportunities where high-frequency communications would be the communications of last resort or of preference, depending on the situation that you were in. So we were looking at the effectiveness of – it was a high-frequency improvement program.

MG: Who was it supposed to be useful for?

LK: It was a Navy communications program.

MG: Okay. Interesting. What was your role in this project?

LK: I helped organize meetings. I helped go through documents. I helped brainstorm ideas. I've always been a pretty good brainstormer.

MG: How were you feeling after a couple of years on the job?

LK: I was definitely ready to move on after a couple of years. I had gotten the book *Dress for Success*. I was trying to be corporate, but I wasn't very good at it.

MG: You'll have to tell me what *Dress for Success* is.

LK: *Dress for Success* was basically a guide for women entering the men's workplace, and how to wear a suit, and how to wear enough jewelry but not too much. I was a bathing suit and shorts person, and I was in the three-piece suit world. I knew I was out of place. When I came to Washington, I went and bought a couple of suits because I knew I had to wear them. But I bought suits in May because they were on sale, and they were wool suits. I almost died my first summer because I didn't realize that there were lighter suits. It was bad. It was really bad.

MG: How come you made the decision to go back to school and not find another job?

LK: I'm not feeling very proud of the story. But my boyfriend got into MIT [Massachusetts Institute of Technology], and he was going to graduate school there. So I applied to MIT, and I got in. So what can I say? We moved to Boston together.

MG: I think anybody who's been admitted to MIT should be very proud.

LK: I am proud, but honestly – and he got admitted to political science, and I got admitted to engineering. So I definitely had better cred than him. But he was the one that took the lead.

MG: Tell me a little bit about what MIT was like for you and the courses you took?

LK: MIT was very intense. In order to do well in those classes, I basically peeled away every part of my life that didn't involve studying for tests and learning the material. I was up against the undergrads because I did not have a lot of the basic engineering. It was predominantly male, and they were nerdy males. It was a very intense place for a young woman to be. It was like being in the physics department at Middlebury because that was all men. There was one other woman who was a year ahead of me, but you always were alone in the women's room. All of your classmates were men. The same thing was true at Booz Allen, pretty much. This other woman that had hired me was in a different division. I found there was a women's lounge, and I was really happy in the women's lounge. I journaled in the woman's lounge about how happy I was, and then I was told that basically, the women's lounge was a place for lesbians to hang out and did not really understand the women's lounge the way it really was. It was hard to find a peaceful spot at MIT.

MG: I'm wondering if these mostly male experiences at Booz Allen at MIT were teaching you had to navigate these male-dominated worlds or places?

LK: Yes, for sure. Starting when I became a physics major, I was really the only woman in the room most of the time. That was true at Booz Allen. There were women in my classes at MIT, but very few. It was all very male-dominated.

MG: How were the female students treated?

LK: Again, I was a graduate student, and I was taking a lot of classes with undergraduates and graduates. I was in married student housing because they let us be in married student housing, even though we weren't married. So I was sort of in it, but I did have my own life outside of it. So I think it would have been very, very hard to be an undergraduate woman in the dorms there.

MG: Do you think that culture has changed since?

LK: I assume so, but I haven't been back. I literally have not been back to MIT since I left.

MG: There were a couple of controversies at MIT during the years you attended. There was a big debate about MIT's involvement in space weaponry and biological warfare research. Was that something that was on your radar?

LK: I was in the electrical engineering department when I was at MIT. I was definitely more interested in administrative decisions. I wasn't so focused on that one. But my graduate thesis was on dual-use technology and military controls on scientific freedom. So I was definitely aware of the deep military connections at MIT and some of the projects being things that were not in alignment with the things I wanted to work on.

MG: Being back in Boston, was it nice to be close to your home and parents during that time?

LK: Yes, for sure. Actually, we started out living with them. It was definitely nice being back where – we didn't see them that often once we moved on to campus, but it was very nice to know they were there. It was a very short commute for Thanksgiving and all.

MG: Just tell me a little bit more about the kinds of courses you were taking and the things you were you were looking at in this program?

LK: So I was in electrical engineering, but with a focus on technology and policy. So I was doing a combination of – we took a lot of classes that were looking at the applications of technology in society and looking at the moral and ethical implications of those technologies, as well as working on the technologies themselves.

MG: What were you hoping to do with this degree when you graduated?

LK: I was interested in it at the time. I have often said that I tend to go backwards through life and find myself in places and take advantage of that, more so than I – I don't have that ten-year vision of this is where I'm trying to get. I just try and make the most out of where I am.

MG: Maybe that's a good way to be present in the work you are doing.

LK: I am definitely very present in what I'm doing. That's a very kind and generous way to say it. [laughter]

MG: You were hired by the National Academy of Sciences not long after you graduated.

LK: Yes. So I did my thesis on dual-use technology. As part of that, I interviewed people at the Academy because they were finishing up a study on a dual-use technology. They were actually doing a follow-on study, and that's how I joined them because the thesis work that I was working on was very well-aligned with the work that they were about to start. So there, I was lucky that my thinking and their thinking aligned very well, and I was actually a little bit ahead of them in terms of the work that they were getting ready to do. It was work that I had already been working on. So it worked out very well.

MG: So you had a working relationship with them while you were still in graduate school?

LK: Yes. They were part of my thesis. They helped me finish my master's thesis.

MG: Right. I'm seeing now that those years overlap there. Where was their office-based?

LK: They were at the National Academy. So they were in downtown DC.

MG: How were you coordinating efforts from MIT in Boston?

LK: I'm forgetting how all this happened. I left MIT to go work for the Joint Economic Committee [JEC]. I think what happened – I went down there for meetings, and I did the rest of the work from Cambridge. So I went down there on occasion, but I did most of the work from Cambridge.

MG: Had you published anything significant before your thesis?

LK: No. I had done my undergraduate thesis, and I had worked on some papers, but they were all classified when I was working for Booz Allen. So my master's thesis was my next "sort of" published – it wasn't really published, but it was published in the MIT library. So the Academy paper was the first one, and it was scutwork. I was taking notes at meetings, making sure that people could get to – logistics and stuff.

MG: Did you enjoy that work?

LK: Oh, yes. Being in those meetings with all these brilliant people talking about issues that I knew a lot about and cared a lot about, and hearing their different opinions and getting to talk with them during breaks. Yes, it was phenomenal. I'm not, by nature, a very academic person. I like problem-solving. So they were trying to solve and make progress on real problems. Even though it was still fairly academic in the way they approached things, it was getting me a lot closer to being able to engage in really important policy issues in a very tangible and deep way. Yes, it definitely was transformative for me, much more so than Booz Allen. Booz Allen was just a job; this was starting to be a passion.

MG: Were you hoping to stay on with the National Academy?

LK: Not really. No. I went back to grad school, and I got my degree. Actually, I was very, very excited to go and work for Congress. That project was very well aligned to me, and then they were going to go off and do something completely different. So I was done.

MG: Your next position was with the Joint Economic Committee. Can you say how that position came up?

LK: I applied for a job there as an economist. I had to take a couple of graduate classes in economics, and they were also very interested in my dual-use thesis work and then the Academy work. Actually, one of the things that I did when I worked for the Joint Economic Committee is I held a hearing on dual-use technology and civilian controls. So that thread continued through that work.

MG: Can you say a little bit more about what the JEC does and what its role is?

LK: Sure. The Joint Economic Committee is one of these funky committees that's actually not House or Senate; it's joint. So there's members from each side. We were housed on the Senate side, but half the members, I think, certainly some of the leading members were House members. Their big claim to fame when I was there was actually that [Ronald] Reagan had decided he didn't like the unemployment numbers. So he had told the Department of Labor to stop publishing them. So the Joint Economic Committee held a hearing every month just after the numbers for the month had been finished and asked for the numbers to be released. Because it was a congressional inquiry and a congressional request, it was a way the Labor Department got around the administrative restrictions and released the data. But they did all kinds of interesting congressionally-related studies. They were not focused on legislation, but they were more of a fact-finding, policy-focused group. They were a lot of fun to work with.

MG: What was fun about it?

LK: It was like an extension of the National Academy study that I was on. They were really smart people interested in very important issues with a forum that they could put highlights on issues for national importance and get a lot of attention. So it was fun to be part of all that.

MG: Do you remember what some of the big issues were at the time? I think your time with them overlapped with an election year? Did that have an impact?

LK: I don't remember very well the election year. The staff was pretty stable, and I was much more staff-focused than I was member-focused, although my office was in the Dirksen Senate Office Building. I got one of the senate directories. I used to keep it with me and check off the senators. I had pretty much seen every senator before I left, and I didn't get to spend a lot of time in the senate gallery, so I was definitely keeping my eyes open as I walked around those buildings. Because it was House and Senate, it also had more of an institutional feel than a political feel. It really was more about intellectual exploration than it was about politics. Although, clearly, politics was a part of it.

MG: I'm wondering if there were people on the committee that stand out to you or whose careers you followed later?

LK: The most lively of the members that I was involved with was Senator [William] Proxmire. He used to give out the Proxmire Golden Fleece Award for the federal spending that was the most ludicrous. I actually found that to be a fairly painful process because I remember he gave one to NSF [National Science Foundation] for studying the relationships between butterflies or something. He would go and find these projects. I always felt like he was speaking to common people who don't understand why the federal government would be spending things, but I was always seeing the value of those kinds of weird studies. So it was sort of an odd position to be doing the research to give out an award for something I didn't really believe in. But one of the staff people who was the one that came up with the idea to invite the Department of Labor – I was much more in tune with that thinking than the member himself.

MG: You were just there for a year or two?

LK: Yes, yes. Because at the same time I applied for the Joint Economic Committee, I applied for the Presidential Management Fellowship, which was then the Presidential Management Internship. I probably would just have stayed working for the Joint Economic Committee because I blew off all the interviews because I was happy where I was, and I probably would have had a very different career. I probably would have stayed on the Hill. But they called me, and they said – the Department of Defense [DOD] called me, and they said they were very interested in my dual-use technology work. I had actually called as a witness the head of the Defense Advanced Research Projects Agency, DARPA, which is now ARPA, as one of my witnesses for the hearing that I got to run. They wanted to know more about that. He was brilliant – Craig Fields. He was just so smart and thoughtful, and I just hung on to every word he said. So when they offered to have me come and do two years of anything I wanted at the

Department of Defense – I’m not a Department of Defense kind of person, but I just couldn’t resist.

MG: There are a couple of things I just want to follow up on. What was the hearing you were in charge of? What did you mean by that?

LK: When I was a staffer for the Joint Economic Committee, they let me conceive of, organize, and hold my own hearing.

MG: What was the hearing on?

LK: On dual-use technology and the balance between military control and civilian business interests?

MG: Did any of this relate to the Persian Gulf War, which took place around this time?

LK: Not that I was aware of. It was more focused on the race with the Russians on technology and on all the technologies that the military had invested in, and that had a significant military application, but also had a civilian application and scientists wanting to take that technology and use it for civilian purposes. But the military wanting to control it and not wanting to declassify it because they didn’t want the Russians and taking it and using it, and maybe the Chinese too, but it was mostly the Russians – and using it for their military purposes. So it was that that tense interaction of when can you run faster and when should your strategy be to protect what you have?

MG: That’s a very complex issue to unpack. I’m wondering what your take on it is. Where do you draw the line?

LK: Yes, it was a fascinating issue. Because of the “run faster” argument, you have to basically – and I see this in NOAA now. People are always so complimentary of the research when it’s resulted in a better modeling output. Even today, the CIO [chief information officer] got a gold medal for the N-wave project because NOAA’s using that for communications. The CIO, Zach Goldstein, was talking about how this was an OAR [Oceanic and Atmospheric Research] research funded project and that it was all that insight from the research team. So it’s easy to see the value of research ten years later when it’s turned into something substantial that affects the lives of all of us. But NOAA’s really struggling to invest in research for the future. It was the same kind of dilemma there. It’s much easier to want to control the technology and not let people use it than let it go and let it evolve and assume that there’s going to be an even better technology coming down the pike, where your military can absorb that and apply it more quickly than the Russians.

MG: That is so interesting. Can you tell me who Craig Fields was? What was his position?

LK: Craig Fields was one of my witnesses, my star witness, and also the director of the Defense Advanced Research Projects Agency. So his job was to – he had a couple of hundred million

dollars, which was a lot more back then than it is now, which he invested in things like creating the internet.

MG: Wow. [laughter] That.

LK: Yes.

MG: When you said that you were going to have two years to do anything you wanted, what did that mean? What did you want that to be?

LK: Well, the Presidential Management Internship period was two years, and literally, the Department of Defense set it up that – I was an Office of the Secretary Presidential Management intern. We went in, and we met each other, and we did some team building, so we had a cohort. Then we were supposed to go anywhere we wanted across the Department of Defense and interview anybody that we wanted. They were all primed to want us to come work for them because we were free labor, and they all wanted free labor. So for two years, we just mapped out all of our own details. We had two years where – my first one, my mentor was Craig Fields, and my first rotation was with Craig Fields. Then, he helped me. He helped guide me to OMB [Office of Management and Budget], which is where I took my next career step.

MG: That was in 1991.

LK: If you've got my bio there, I believe you.

MG: I do, yes. It helps me stay on track. Now tell me a little bit about that position unless there's something I'm missing up to this point.

LK: No, it's all good. It was amazing to be able to –I interviewed with so many people across the Department of Defense. Craig Fields was amazing. He spent a lot of time with me. He let me sit in on big meetings and let me understand what their process was. They had so many smart people, and they were working on so many exciting projects. They were in the “run faster” camp. So they were trying to figure out where the big ideas were and put money behind them.

MG: What was the position with OMB?

LK: He basically told me that since I was interested in affecting policy and I wanted to really have a seat at the table, that I should go to OMB. I went to OMB, and I went to work for the defense division. I didn't understand what he was talking about at all because it was such a sleepy place. The staff there really were not very engaged, and it turns out that OMB does not actually have that big of role overseeing defense, where they have a big role overseeing all the other parts of the federal government. While I was there, I didn't do very much interesting stuff with defense, but I realized that my dual-use technology thread was of great interest to the Commerce branch – Commerce and Justice branch at the time – because they were funding the National Institute for Standards and Technology [NIST]. They were trying to do the “run faster”

thing from the other side. They were trying to do it from the civilian side, and that was of great interest to me.

MG: Can you say a little bit more about that?

LK: I had done a lot of grad school work on technology evolution, and on competition amongst companies, and on monopolies versus startups, and basically, how to maximize innovation in society – private sector technology and the role of government and regulating technology. Having worked at the National Academy and then at DOD on the military controls and civilian and scientific freedom, I was always on the military side of that. So to be able to go to the other side of that and to be on the “run faster” side for the benefit of society and the benefit of the economy was just a very exciting opportunity for me.

MG: In your notes, you said you worked on something called spectrum auction. I had never heard that term before.

LK: So I went, and I did this rotation at OMB, and I didn't really like it at all. So I went back to the Department of Defense because I was there for two years anyway, and I had other time to spend. Then, I managed to get back to OMB, and I did another stint at OMB with the Commerce branch, and I really liked that. I wanted to go and work there. So eventually, that's where I got hired into the Commerce branch. My responsibilities were the Patent and Trademark Office, NIST, and the Census Bureau. I didn't want NOAA at first. That's where I was still sort of trying to stay away from the environmental stuff. My career was this dual-use stuff, and the environment was something I loved, but I didn't do it at work. So one of the projects that I got involved in was – the Federal Communications Commission, the FCC, controlled the spectrum. The radio spectrum was already pretty well-established. The TV spectrum was pretty well established. But now industry was in desperate desire for more bandwidth and was able to use the higher frequencies, but there were things – military applications and some other things – that were going on at those higher frequencies. But industry was willing to pay huge amounts of money to get access to them. So the FCC was working to clear applications out of those higher-end spectrums so that they could open up chunks of that spectrum for sale. So this was when cell phones were booming, and everybody was wanting – and we're still in that mode – more and more bandwidth to communicate more and more information for more and more applications. At that point, iPhones were not a thing, [laughter] but the pathway to the iPhone was becoming clear. So that was a huge political issue because [Bill] Clinton was the president, and he needed that revenue in order to seal the deal for his major negotiations with Congress. So it was a many, many billion dollars – hundreds of billions of dollars of negotiations had gone on, and they were a couple of billion short, and it was the spectrum revenue that helped close that gap. So it was one of the most exciting periods of my career. I was literally called up in the middle of the night to go to the Senate to read the report language to make sure that it would allow for the spectrum to be sold in the way that we had agreed to. I was sitting in the Capitol, reading this language in the middle of the night hours before the senators came in and voted on the bill. So it was pretty heady stuff.

MG: Who called you to come in?



LK: My branch chief called me because the congressional staff that was negotiating the bill called OMB when the bill was at a point where they needed to know that the administration would approve it. Then the OMB point of contact reached out to all the people who were responsible for all the pieces of language that were in that final bill to make sure that each of them aligned with the policies that had been developed.

MG: What was the final bill? What did all of this result in?

LK: So it was the omnibus appropriation, and it was hundreds of billions of dollars across multiple agencies to enact major legislative changes and to fund major parts of government. It was a very contentious relationship between Congress and the Clinton administration. Again, the spectrum auction was – as they were negotiating, they got closer and closer, but they were still billions off to make the deal. So the spectrum auction ended up helping to close that deal because we helped justify a higher estimate for the auction based on recent sales.

MG: Okay. My eyes are crossing a little bit when you explain this to me. It's not something that I can totally get my head around.

LK: Can I try and explain it again because it's really not that complicated?

MG: Please.

LK: So these communications companies wanted to buy the spectrum. The FCC, the Federal Communications Commission, was starting to sell pieces of spectrum. They were starting to understand – they were holding these auctions, and they were auctions. They weren't just selling it; they were auctioning it. So people were bidding on it, and the bids were getting higher and higher. So we were starting to understand the value, the price that people were willing to pay for this. They had identified big blocks of additional spectrum that they were going to put up for sale. So as the results of the auctions were coming in, and we were getting an understanding that the value of the spectrum that was yet to be auctioned was much greater than we had originally believed, I was able to convince the Congressional Budget Office that the value of the spectrum auctions was going to be much greater, billions of dollars greater, than we had earlier estimated.

MG: So it would be worth it?

LK: It wasn't that it would be worth it. I mean, this is in the OMB world. It wasn't an accounting thing. The bill was going to authorize the sale of this spectrum. My job was to estimate how much revenue we would get for that auction. So by saying that we were going to get ten billion instead of two billion, I could pay for eight billion dollars of what President Clinton wanted.

MG: I see. This was during the era of "Reinventing Government." Was that something that was on your radar or impacted your work?

LK: So I definitely had a lot of reinventing government experiences when I was at OMB. I participated in it. That was more of a [Vice President Al] Gore thing than a Clinton thing.

Because when you're at OMB, the responsibilities get divvied out. There might have been Reinventing Government stuff in there, in terms of that bill, but not stuff that I was involved in. By that time, the Reinventing Government stuff got spread across every department in every agency. So I implemented Reinventing Government actions on NOAA. I think I broke a lot of NOAA systems when I did it.

MG: What do you mean?

LK: It's one of the things I feel guilty about. Part of Reinventing Government, for example – the argument went: you can do HR or acquisition and grants, or name your administrative function, much more effectively, if you automate. So we're going to assume that these processes are automated, and we're going to take the savings. So that's what they did, but they never automated. They just broke the systems. They broke them. They broke them at NOAA for twenty years.

MG: Have they been repaired or recovered?

LK: In the last three years, they have finally accumulated the resources they needed through a very, very painful process to fix the things that we broke in the '90s.

MG: Once that omnibus bill had passed, what was your next focus? What was next for you?

LK: I took the NOAA account. The NOAA examiner left and came to NOAA, Jeff Payne, and I took that account.

MG: Tell me a little bit more. How did your job change?

LK: I fell in love with NOAA. I had spent years successfully attracting most of the investment of my branch in my agencies and taking the money away from investments in NOAA. [laughter] Now I was on NOAA's side. So I spent a lot of time getting a lot of money into NOAA.

MG: This was between 1994 and '98.

LK: Yes, I think so.

MG: Was NOAA your only account? Did you have other sections of Commerce?

LK: When I took on NOAA, it was my only account because NOAA is big. Maybe I had some other small stuff. I think I did like Marine Mammal Commission and stuff like that, but NOAA was by far my biggest focus.

MG: How did things change over those four years? What were you working on?

LK: What NOAA projects that I work on? Oh, wow. I helped build the new National Severe Storms Lab [NSSL] in Norman, Oklahoma. Actually, I did that when I was at NOAA. What did I work on at NOAA? I worked on so many things. I worked on expanding sustainable fisheries.

I worked on improvements to the Weather Service. I worked on investing in climate change in decadal and seasonal climate. I worked on all the NOAA issues.

MG: Was this work concurrent to the modernization and restructuring of the National Weather Service?

LK: Yes.

MG: Did that impact your work with NOAA? Was it a big part of what you were looking at?

LK: It was. Satellite launching was also big. I think I tended more towards the research and to the “wet” side in terms of my interests, but I worked on all of it.

MG: You eventually came to work for OAR.

LK: Yes, I did. I decided that OMB was a very stressful place to work, and everybody around me was getting these eye ticks. I felt like I was starting to get eye ticks, and I didn't want eye ticks. Actually, the Deputy Secretary of Commerce, I reached out to him, and I told him I was interested in coming to the department somewhere. I still wasn't sure I wanted to do full NOAA. But then I was offered that deputy job at OAR, and I was delighted to have it.

MG: Tell me more about that position, the history of OAR, and what their major issues were at the time.

LK: Major issues included focusing on climate. They were making a lot of progress. I remember, shortly after I arrived, the Weather Service issued the first El Nino forecast, and it was verified. It was the first time the Weather Service had actually issued a climate forecast, and it was just a huge – this is where you do research for years, decades even, and the breakthrough comes when it becomes operational, and it starts affecting a lot of people's lives. Sea Grant was being proposed for elimination, and I worked on getting Sea Grant into the budget. That's when I worked on the new building for the National Severe Storms Lab. We worked on the new building for Boulder and making sure that it was built outright. We worked on Science on a Sphere – Sandy MacDonald. I helped with that. Great Lakes Environmental Research Lab was starting to do the water quality forecasts – so exciting – with a basic model that looked at pollutants, including sewage. What they figured out is that when it rained hard enough, and we knew what the forecast was, that it would overflow the sewage system. Then we knew, given where the overflows occurred, how long it would take the sewage to get into the lake. Then they had done a lot of good work on the circulation patterns of the Great Lakes. They knew where the sewage pipes came in, and they would just run the circulation model. So then they were issuing beach closure forecasts. So these were the new environmental forecasts that were just huge in terms of helping protect clean water. Air quality forecasts were coming through. We had some volcanic plumes. That was another dual-use technology thing, but we had some great environmental forecasts there. So, all of a sudden, going from weather forecasts to really Earth system science forecasting was a huge part of those years in OAR, and they're still coming.

MG: You said they were studying volcanic activity while you were in this position. Do you know what eruption that would have been?

LK: I have no clue. What I remember is that – I think one was up in Alaska because all the planes had to be diverted. We had some very good models that could do those plume forecasts, which were really largely funded by the Department of Defense for poison gas, but they had tremendous civilian applicability.

MG: Can you tell me the genesis of Science on a Sphere? It was such an enormous undertaking, but I'm not sure how it started.

LK: Two days ago, Sandy MacDonald told the creation story of the Science on a Sphere, so I'm in a very good position to tell you that story. He was asked by NOAA leadership to go and work with Al Gore to create the GLOBE [Global Learning and Observations to Benefit the Environment] program. The GLOBE Program is a program that invites citizen science to contribute data to help scientists better understand the global dynamics. They used to have long conversations about the importance of explaining climate change to the public. Gore kept saying that we need better ways to show people data. Sandy MacDonald is the inventor of the Sphere. He said it took him a couple of years, but it kept tickling around in his head, and he eventually got a beach ball. He was fiddling around with how you would wrap an image around a sphere, where the light would be evenly spread. So what would you have to do to the image to take it apart and then project it on the sphere in such a way you actually got a coherent image? They built the first Science on the Sphere in Boulder, Colorado, and they worked through that technology. The first sphere weighed two-hundred pounds. They were terrified that somebody was going to get underneath it and get squished, or that it would fall, and it would chase children out of the room and squish them. So he invented it. He invented it in his garage. He invented it on a beach ball. We estimate that a billion people have seen Science on a Sphere.

MG: In what capacity? How has that been possible? Does it travel?

LK: Actually, when I was the deputy in OAR, I helped fund the development of that Sphere. Then, when I moved to the Office of Education, we actually funded the dissemination of – NSF was the first agency to fund the Science on a Sphere in a publicly accessible place. Maryland Science Center had seen it and put in an application, and NSF funded it. Then NOAA took up the funding of it. We had a grant program, which started right before I joined the Office of Education, and then they spread it around a bit. Then it was so popular that we started focusing more on creating a user community to use that science well. We had our meeting earlier this week. We had the Science on a Sphere network meeting with one hundred and sixty people or so from all over the world, coming to think about spherical technology and how to use the Science on the Sphere to display climate change. Oh my god, one of the last speakers that I heard, they were a presenter, talking about how to engage people on a sphere and give them hope and move them along the path to thinking about solutions. They were talking about how their life was basically consumed by the sphere. Another woman said that her entire career, and she's in her forties now, was the Science on the Sphere. So these people have dedicated their life to using it for the purpose Gore and MacDonald talked about in the '90s. So, just amazing.

MG: Yes. I can't think of a better way to showcase NOAA's services than using the entire planet.

LK: Yes. Sandy talked about what size it should be. They wanted it big enough so that people felt that it was bigger than them, but small enough, so they felt that they could approach it. They wanted it to look like what an astronaut would see from space, like from the moon, which is about as far as astronauts got so that they could see it as a whole, as an integrated system, and its beauty, and see the science on it, but not have it be something they could hold in their hands. He really thought a lot about what size it should be because he could have made it – he actually thought about making a twenty-foot one for the Denver Airport, which never happened. Anyway - fun.

MG: What's the future of Science on the Sphere? What is it doing next?

LK: So OAR has changed his policy and has said that they can no longer generate income from the sales of spheres. COVID has shut down all the spheres. So right now, I'm working very hard to make sure it's alive for another year. Ben Friedman has stepped up and said that he's willing to fund the Sphere out of emergency funds. That'll last a year. If we don't find funds in a year, the network's going to go away. So that's my big project.

MG: That sounds so important.

LK: Yes, I think so.

MG: How are you doing for time? We still haven't talked about your experience in the Office of Education. So I didn't know if this is a good place to stop and pick up for next time, or if we should just keep going.

LK: Whatever is best for you. You ask great questions. You're a great listener. I'm happy to do whatever is you think is best.

MG: Okay. Let's keep going for a little bit longer and see what we get through.

LK: Okay.

MG: It sounds like in this position, you were really getting to see how every service and line office functioned at NOAA.

LK: I like to play across all of NOAA. I really do. Yes. OAR really helps with that because they connect with all parts of NOAA, and their thinking is so big and so broad, just such smart people there. Then, in education, I run the Education Council, and that has people from all parts of NOAA, and that was always very, very important to me, to interconnect them. Because I think I started knowing about NOAA at OMB and seeing the damage that the infighting does within NOAA, I've always been very interested in trying to figure out how to make the whole greater than the individual parts. I understand why the line offices and the programs within the line offices are resistant to that. Yes. To me, it's just a fun puzzle.

MG: Has that tension always existed? Does it ebb and flow?

LK: Oh, it's gotten better. It's gotten much better. When I worked NOAA from OMB, the folks that supported weather would propose increases by pointing out all the places in Fisheries that didn't need the money that they were getting. It was basically a civil war. I think Admiral [Conrad Charles] Lautenbacher really helped with all his integrating efforts. I think the Friends of NOAA really helped.

MG: What else from your time as Deputy Assistant Administrator for OAR stands out to you?

LK: [laughter] One of the things I got to do is I got to fund small efforts. One of those small efforts was a very small amount of money to help – I'm forgetting her name, but she's a Native American, and she has her meteorology PhD. She now works in the River Forecast Office in Oklahoma, I think. She was just the featured speaker for a Native American cultural talk at NOAA. She actually saw my name on the list and thanked me for the support. It was amazing to see how little I did to support her and yet, how important she is. She's an icon at NOAA. It's one of the things that's amazing about being in a high-level leadership position is that you can make these little decisions that have such a big impact on people's lives, and you make so many of them so many times that it's hard to keep track of. So when they come back to you years later, it's just so gratifying. Yes. We did so many fun things when I was in OAR. My favorite part for sure was just listening to the lab directors talk about their science, talking to Dan Albritton about the work that he did on the ozone hole and the meetings that he was in, where they actually got the commitments, where they started to understand the damage that ozone was doing and then the meetings that he was, where he was able to articulate to policymakers. My job was really to try and do the best that I could to bring money in and to support the people that were doing the great research. So many different things – tower array, the tsunami forecasts, the Great Lakes forecast that I talked about, air quality work that we did, [and] so many incredible research projects.

MG: How did you think about your next steps at this point?

LK: Yes. That's a good question. My husband and I are starting to think about retirement and when that's going to happen. I turned sixty-one on Tuesday. I don't sort of feel like – it's really hard for people to tell what's going to come. I think I'm going to work for at least five more years, and then I don't really know.

MG: I want to dive into your time as NOAA's Director of Education. I'm wondering if you can provide a little historical context for that office and where it's situated structurally?

LK: Yes. I don't know the history from the beginning, but it used to be the Office of Education and Sustainable Development. I think it was actually created for Roan Conrad, who was the brother of Senator [Kent] Conrad, who was a political that came to NOAA. Then I think he burrowed in. So I don't really know a lot about all that, but by the time I got there, it had become the Office of Education. It's always been a policy office that's in the undersecretary's purview. I used to report to the Deputy Undersecretary, and now I report to the Chief of Staff,

for some history of political nature. Before I got there, and even more so after I got there, our budgets grew for education programs. So we have a policy role that covers the entire agency, and then we have our grant-making role that's really externally-focused. So it's a great office. I love it.

MG: Had you been hoping to be hired on there? How did the position come up?

LK: The Director of Education position had actually never been filled. Marlene Kaplan was in there as an acting, and they wanted to fill it with a senior executive. It was a very attractive position, and they offered it to me. So I was delighted to accept it.

MG: I saw that you got to choose your title for this position. So, in what capacity did this position exist before? Why did you choose the title you chose?

LK: So it was the Office of Education and Sustainable Development, and then it became the Office of Education. But this goes back to the one NOAA thing. I didn't want to be the director of the Office of Education. I mean, I wanted to be the director of the Office of Education, but I wanted to be the Director of Education for NOAA. I wanted to be the NOAA Director of Education. I don't understand why we have a Director of the Office of Legislative Affairs; we should have the Director of Legislative Affairs. We shouldn't have a Director of the Office of Human Capital services; we should have a Director of Human Capital Services. Yes, it's a dual-headed role. My staff is the Office of Education staff, but I want to be connected to, represent, strengthen all the education capability across NOAA. I don't want to just be a headquarters function that isn't connected.

MG: So what was important to you when you first came on? What were some of your first priorities?

LK: Getting to know the staff, strengthening the Education Council. There had been controversies over what constituted education versus outreach. People were very interested in differentiating education from outreach and only focusing on education. I just thought that was ridiculous. Not that education and outreach aren't different, but that I'm much more one to soften boundaries than to harden them. So the idea of going around NOAA and telling people that their education products weren't education products, that they were outreach products – I was not going to do that. I was not going to let my staff do that. So if people wanted to do outreach projects, let them do outreach projects. If they wanted to call them education materials, then let them call them education materials. I don't know. NASA [National Aeronautics and Space Administration] had had a big effort to try and clean up its education materials, and they set requirements and certified them, and it's not where I wanted to put my energy.

MG: So where did you want to put your energy?

LK: Into building a community where educators felt the connection, not only to their programs but to each other. Because in a lot of parts of NOAA, the educator is actually pretty lonely. They're the only educator at a sanctuary or the only educator at an estuarine research reserve or the only educator in Sea Grant, or maybe there'll be a couple of them. But they're usually not

the top dogs. The scientists are the top dogs, or the extension agents are the top dogs, or maybe they're the only ones. So I want them, of course, to identify with their programs. I want them to feel like they represent that program, and that program is incredibly important because it is, but I also want them to see the commonalities and feel the connections and benefit from the investments of other people. We don't have to figure out how to engage with the Discovery Channel in seventeen different ways. We don't have to figure out how to go on a cruise ship from every program at NOAA. We don't have to figure out how to support an aquarium in twelve different ways. We can actually try and leverage our connections so that the pieces create a greater whole, rather than everybody having to do everything for themselves. So that was definitely where I was coming from.

MG: In my preparation for this interview, I kept thinking how I can't imagine how you keep track of everything. There's so many partners, there's so many programs, and there's so many grantees. I was curious about your project management approach and how you manage this enormous effort?

LK: That's easy. I have fantastic staff who are all smarter than I am. [laughter] No question. I don't have to keep any of it in my head because I have people that that do all that for me.

MG: Can you say a little bit more about the scope of your work?

LK: Yes. Our largest investment is in higher education. The largest education program that NOAA has is the Educational Partnership Program with minority-serving institutions. That's focused on four cooperative science centers around big areas of NOAA's investments. So we have one focused in fisheries, one focused in coastal resources, one focused in remote sensing, and one focused in atmospheric and climate science. We're really trying to train a diverse cadre of professionals for NOAA's future workforce. Then, we have these granting programs that are focused on – one is fairly focused on meaningful watershed education experiences, so trying to get kids out of the classroom into their watershed and understand what the quality of the watershed means, how you assess it and identify issues, and then what are pathways to improvements. That's an incredibly powerful program. The other one is focused on resilient communities. It used to be focused on climate change, but we realized that there were too many communities that weren't willing to talk about the changing climate because it's too political. Yet, every community needs to think about how to become more resilient. So it's a much more positive way forward. Because the other thing about climate change is it's tough, and for educators who are teaching climate change, it's tough. At least with resilience, you can talk about solutions and how to make things better. You can talk about problems, and you can talk about all the horrible things that are going to happen, but you can also talk about what you're going to do about them. That's a much better way to engage people and keep them interested.

MG: It's tough to discuss because it's become politicized?

LK: No, it's tough because we've done so much damage to this earth system that we live on that there's so much damage, and the consequences are so enormous. Just look at the hurricane season that we just had. Look at the fire season that we just had. Look at how many people are starving. I was just reading today, the hurricanes that hit Central America are going to cause a



huge migration of people out of Central America because their homes were devastated; they have nothing, and they're very vulnerable. So many people in this world are so vulnerable and increasingly vulnerable. But you don't want to just talk to people about all the vulnerabilities and all the horrible things that are [happening] and how we're continuing to do those horrible things because they just shut down and go away and stop listening. If you want them to listen, you have to give them hope. The only way to give them hope is to talk about how things are going to get better.

MG: Can you tell me more about some of those programs that are tackling resilience and providing hope?

LK: Obviously, when you invest in students who are learning and growing and getting them trained and educated in NOAA-related science, that's a great pathway for hope because every single one of those students is a pathway for hope. You're arming them to actually combat these problems in a very sophisticated way across all kinds of disciplines, whether it's overfishing, or ocean acidification, or resilient strategies. Our grant programs [are] using education as a strategy to involve communities in resilience planning. So many different wonderful things we get to do.

MG: Somewhere in my notes, I have all the stats of students that you've guided through STEM [science, technology, engineering, and mathematics] careers, and it's really impressive.

LK: Yes, yes. I don't think I sent you our metrics page. But our metrics are amazing. They're just amazing. Science on the Sphere is a big part of that.

MG: Are you able to rattle off some statistics in terms of numbers?

LK: Let me send you to the page. Because then you can pick the ones that you want. We have good success measures.

MG: I just found some statistics in my notes. "More than nine-hundred students earn post-secondary STEM degrees, and over eight hundred of these students have come from underrepresented populations."

LK: Those are for the Education Partnership Program, but we have even better numbers for all of NOAA. That's one of the things that we do as a community is we put together these impact measures. Every single one of those students we've enriched, and we've empowered, and hopefully, we've unleashed to help us solve the problems that we have.

MG: It's such a powerful program. There's been so much direct impact from the work that you're doing. I'm aware that we're running out of time, but I do have a few more questions. I don't think we'll be able to squeeze them in before five o'clock. So maybe we'll stop here for today. I will take just take another half an hour of your time for next time.

LK: That'd be lovely.

MG: Forgive me for jumping all over the place. This gives me a lot to think about for next time. Do you have anything else you wanted to add?

LK: No. It's lovely to talk to you.

MG: I feel similarly. I've been really excited about this opportunity. I'll stop the recording here. I just want to thank you for your time today.

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

Reviewed by Molly Graham 1/28/2021

Reviewed by Louisa Koch 4/1/2021

Reviewed by Molly Graham 4/6/2021