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IN PARTNERSHIP WITH
NOAA HERITAGE AND THE NATIONAL WEATHER SERVICE

AN INTERVIEW WITH DR. LATOYA MYLES
FOR THE
NOAA 50th ORAL HISTORY PROJECT

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Molly Graham: This begins an oral history interview with Dr. LaToya Myles for the NOAA 50th Oral History Project. The interviewer is Molly Graham. Today's date is December 4, 2020. It's a remote interview with Dr. Myles in Knoxville, Tennessee. I'm in Scarborough, Maine. We left off last time with the major study you were doing in your first position at the Atmospheric Turbulence and Diffusion Division [ATDD] in Oak Ridge, which was the East Tennessee Ozone Study. Could you give me a few more details about that project? What were you looking at? What did you learn? What did the study show?

LaToya Myles: Sure. So as I started my position, the East Tennessee Ozone Study, or ETOS, was already established by one of my colleagues, Will Pendergrass, and had a network of measurements throughout the East Tennessee region where he was primarily looking at ozone as the name implies. But when I came on board, I really wanted to try to understand some of the other chemical species and take other measurements at those sites. So we expanded it to take some nitrogen and some sulfur measurements of those different gases. We were able to publish that work for ETOS, as well as hosting a regional meeting with some of our federal partners from the National Park Service as well as academic partners from the University of Tennessee, where we had a culmination of what have we learned from ETOS over the years, how has it helped us understand what happens meteorologically and atmospherically in an area that has complex terrain. So for those who are unfamiliar with East Tennessee, I think of it as corduroy pants, right? We have the Cumberland Plateau, and we have the Great Smoky Mountains. Then Knoxville and other cities are in the valley in between. So we've got this ridge/valley structure. That causes us to have differences in the way storms move through our region and how our air quality exists. Because you can imagine, if you've got two places of higher elevation, like the Smokies and the Cumberland Plateau, and you've got the main population residing in the valley below, what happens is air parcels move across, and everything gets deposited into the valley. That's what we were able to see in some of our data is that the topography and geography of a region can have a real effect on how chemical species move throughout that sphere.

MG: Wasn't there also something that showed that folks were underestimating the ammonia emissions?

LM: A lot of that work tied into trying to understand the various sources of ammonia. Of course, the biggest source comes from agriculture, but then there's also some ammonia emissions you can get from motor vehicle traffic. Of course, the interstates in East Tennessee run right along that valley, the lowest part of the topography in our area, and have contributed to some of the measurements we saw with higher values for ammonia and other things right along that valley area.

MG: Were there other projects or studies you were working on in this first position? This was from 2004 to 2013 that you were in this role.

LM: Lots of other studies, really interesting things. ETOS was really the one that was closest to home. But we did a lot of other studies looking at measuring ammonia in various locations around the country. We partnered with different universities in different regions to do that. One of the biggest ones was my first study funded by NSF [National Science Foundation] happened around the end of that time, beginning of my next position here at ATDD, trying to understand

ammonia and connections to air quality models, and how it was being captured or characterized in the models. We partnered with the University of Illinois and had some funding from NSF to do some field studies. That was a really wonderful partnership with them because one thing they have in the Illinois region is lots of agriculture. They do a great job at UIUC [University of Illinois at Urbana-Champaign] of trying to understand the dynamics around agricultural ecosystems. Then we were able to bring our expertise from NOAA [National Oceanic and Atmospheric Administration] in from the atmospheric chemistry and meteorology side of things, and have several years of measurements where we were specifically looking at what happens over particular agricultural crops and how ammonia is volatilized or released after fertilizer application and what those long term consequences are when it comes to air quality where that ammonia ends up, whether it's transported somewhere else or deposited back into that same field.

MG: Does any part of your role involve education to increase awareness around this so that it influences policy at some point?

LM: Yes, absolutely. I think, particularly for the Illinois study that I was just talking about, we had partners that we met through the extension offices at the university and through other partnerships, who really truly understood about best practices for agriculture and trying to bring together the science that we were doing with how they inform best practices when they're actually talking to farmers across the country. Because I think we all have the same goals as trying to be good environmental stewards, but we're just approaching it from two different aspects. That was one of the things I learned is there is this whole community, through agricultural extension, through the farmers, through the universities, that are transitioning that science in a way to where it's actionable for people who are actually utilizing the fertilizers and making these decisions. When it comes to having that outreach aspect of it, one of the things that we try to do is incorporate postdocs and students into that work as well. Actually, that's the first project where my current postdoc and I started working together was working on these datasets and then being able to train the next generation of scientists in this field.

MG: What are some best practices? How would farmers adapt to changing their methods?

LM: There's a couple of things that we found. It's just trying to understand about best times to apply fertilizer, fertilizer rates, understanding how often to apply. When we were doing our work, we were looking at a specific crop type, at a specific soil type, and understanding all of the dynamics that happen in one particular field. I think that that's where we have that knowledge base with farmers and with others of knowing their land and understanding the needs of the vegetation that they're trying to grow on their land. So there are some big things that we talk about when it comes to best practices of application rate and application timing. But all of that really gets married into knowing what's best for your particular soil type and crop type and meteorological conditions where they have their field.

MG: Are you mapping the particulate matter so that you can see there's a farm in Illinois, but it's impacting a city somewhere else? Are you able to see those patterns?

LM: Not specifically for me, because we're more on the data collection side. But there are individuals who are doing that type of work when it comes to doing some regional modeling.

MG: How were you shaping your career path and research projects? Could you decide what projects you wanted to work on what studies you were involved in?

LM: I did. I think, in that regard, I really had great opportunities to seek out collaborations with individuals and to set my own path when it came to research and pursue areas and ideas that were of interest to me but that also aligned with the work that NOAA and my lab are doing and the mission that we have. So I think that when it came to a lot of atmospheric chemistry measurements, we have a long history of doing those types of air exchange measurements in my laboratory. We've had scientists and engineers who've been involved with supporting that work for decades and decades in our lab. So I think the alignment worked out really well for me in that area. Then I was able to take that and my more broad background when it came to environmental science and really take that in a direction where I wanted to go. A specific example is that I have been pursuing for the last couple of years, trying to understand what happens to ammonia in coastal ecosystems, because I think we've done a great job of trying to understand the dynamics and to have really good measurements in areas that have flat terrain that are somewhat homogenous, but then if you take that – what really happens when you're at the boundary of the land and the sea? How do those dynamics change in an area that's really sensitive to nitrogen and nutrient loading from the atmosphere? In that work, I've reached out to scientists who are in NOAA's National Ocean Service and who work in coastal work in some of our National Estuarine Research reserves and other programs that NOAA partners with, and take time to understand what their needs are from what we call the "wet" side of NOAA. Then taking our understanding from the dry side of NOAA's atmospheric sciences, how can we marry those to understand some of the complex dynamics that happen when we're taking a nutrient like ammonia and other nitrogen species and transitioning those from the atmosphere to a coastal marsh, for example, or to a wet ecosystem and what those dynamics are over time.

MG: Logistically, how do you set up those partnerships across line offices?

LM: Sure. For me, it all starts with trying to reach out to scientists. We have a great set of seminars and webinars that always happen across NOAA that they advertise really well. So I start there, in seeing what's being presented by other scientists across the agency. I also use a tool in my toolbox of some of the conferences that we attend, the large scientific conferences, understanding what some of my NOAA colleagues and academic colleagues are presenting. It gives me a better idea of the direction of their research and potential for any types of collaborations. Often, it's just setting up those initial conversations and exploring ideas. From that, sometimes, we do have collaborations and partnerships that develop and opportunities to pursue research funding to do larger projects. Sometimes it's more informal – exchanging data just to try to understand some of the phenomena that we're studying in a new and different way.

MG: In 2013, you went from physical scientists to lead research physical scientist. Can you talk about that transition and how your job changed?

LM: Sure. It's more of a leadership role now. Whereas I had been collaborating and working on a team, taking on that position really helped me transition and start thinking about a different side of the science, not only asking the questions and conducting the observations but also how do we plan those research studies? How do we, as you've mentioned, build collaborations? How do we pursue funding to support really good scientific ideas? How do we ensure that ideas are aligning on a broader level with the agency's mission and their priorities and thinking about the science from more of a management perspective, as well? So it was different, and it's something that I find a lot of joy in, particularly bringing scientists and engineers and technicians together to tackle some of the bigger questions and not just thinking about how do we deploy the instrument, but why are we deploying the instrument? Where are we deploying the instrument? For how long? And being able to help bring all of that to fruition.

MG: Are there a couple of offices within the Oak Ridge facility?

LM: We're the only NOAA office here. It's just our one office. But the Department of Energy [DOE] has thousands of employees in our area, but they're all in separate facilities. [Editor's Note: These numbers vary due to the COVID-19 pandemic and other workforce changes.]

MG: Okay. You're in the Atmospheric Turbulence and Diffusion Division.

LM: Correct.

MG: So are the other locations, such as in Idaho and Las Vegas, different divisions?

LM: Correct. So we're all under Air Resources Laboratory [ARL], and there are four divisions. There's a division in College Park, Maryland, and Idaho Falls, Idaho, Las Vegas, Nevada, and in Oak Ridge, Tennessee.

MG: What's the relationship among the divisions?

LM: We all have a shared history, going back to 1948, where we started supporting some of DOE's research, particularly in Oak Ridge, providing meteorological support for a lot of the testing and the different studies that DOE was conducting in the early days of Oak Ridge. From that time, we started as special projects offices, looking at weather research. From that time, we have developed over the years into becoming a division of the Air Resources Laboratory. But we still have, in many cases across ARL, close ties with DOE in supporting their work in meteorology.

MG: Getting back to the lead research scientist position, did the nature of your work shift, where you were doing more management and less hands-on fieldwork?

LM: At that time, it was probably about half and half, I'd say, spending most of my summers still doing field research and supporting field research, and then also contributing in different ways. I think I started taking on more roles, serving on steering committees and working groups, again, looking more broadly across the scientific discipline. So probably about half and half

when it comes to time, but just being more engaged on a higher level within the agency and with our partners in how we advance the science.

MG: Are there any challenges or moments that stand out to you in this transition, in this role you took on?

LM: Oh, yes, absolutely. I tell the students that I mentor now to take some classes or some online training that allows you to understand budgeting and project management. [laughter] Because when you're in graduate school as a scientist, you don't get that type of training typically. You're really focused and delving really deep into your scientific discipline. But as you transition in your career, you're going to get to the point where you'll be working with the budget and trying to understand how to develop a budget and present a budget so that you can receive funding for your work. So being able to understand about the takes, the puts, and how you develop that, and understanding about how to account for people's time and salaries and equipment and instrumentation is really key. Then also, understanding project management. Because when you're writing proposals as a primary investigator or a co-investigator, it's critical that you can relay your scientific ideas clearly, just as much as you can relay your ideas about how the project will be managed. When are you going to plan? How are you going to execute the project? How are you going to analyze the data and then report out and the timeline for all of those steps? So project management and budgeting, I look back, and those are two skills I wished I had spent more time developing.

MG: I'm sure you learned them on the job.

LM: Yes, I did. [laughter] That's why I tell all of the graduate students and postdocs now, "Don't do as I did. Learn it now and make it easier on yourself."

MG: Have you had to deal with personnel issues, hiring, and firing?

LM: Actually, it got to be when I was a supervisory physical scientist, so just fairly recently that I moved into the realm of actually dealing with team development and human resources, and all of those different performance evaluations, and all those different types of fun aspects of being a supervisor. That's a whole different skill set, another group of experiences and learning what an individual needs to be successful. While I'm still a scientist, I'm learning how to effectively bring a team together, evaluate performance, and help people be their absolute best in the roles that they have with the agency.

MG: In terms of the research side of things, you were still looking at ammonia, but also something called blue carbon. Can you say what that is?

LM: Correct. Sure. That ties in with some of the work when we started going to coastal ecosystems because ammonia and nitrogen are nutrients when they come into some of these ecosystems. So they're engaged in some of the cycling of nutrients and what happens. Blue carbon is carbon that is accumulated and stored and available in blue ecosystems and water ecosystems – salt marshes and other areas, aquatic ecosystems that interface between land and water. A lot of that carbon is stored in that area and can be influenced by the dynamic between

how much nitrogen is used by the vegetation in that area and how that vegetation can affect the uptake of carbon from some of the sediment in that area. So it's a really complex and dynamic relationship between those two. I just saw it as an opportunity of how we can take the measurements that we were already collecting as atmospheric scientists of carbon and nitrogen right above the surface of the earth, and how do we marry those and look at exchange rates of the measurements that are currently being taken up – nitrogen and carbon already in some of these coastal ecosystems. We're measuring similar species, taking different approaches. But what would happen if we brought those two together in a specific area? How could they inform each other? Even though we're approaching it from two different disciplines, how do we make it more of a holistic measurement program?

MG: This may be a silly question. But has your work changed the way you think about the air you breathe and where you go? Are you thinking closely about each breath you take?

LM: Yes, especially since the pandemic. I think what was interesting to me as the science for the pandemic advanced and grew is people started talking about how viruses and other items travel in the air and having good airflow and understanding about being outside. The value of being outside is the fact you have turbulence, and you have this constant motion of air versus inside, where you don't tend to have that. I think about that in terms of our laboratory here in Tennessee because the movement of air and turbulence is something that we've been studying since the 1940s. So we really do have a good understanding of some of those dynamics and what happens. Seeing how important that is currently makes me think more about air movement and how this phenomenon that we've been studying for so long has this real-world public health impact at this point.

MG: Is your work shifting in that direction? Are you looking more at the relationship between particulates and COVID because there is such a strong correlation between air pollution and adverse impacts and death?

LM: I am not. But I do have colleagues in the Air Resources Laboratory, where they have actually been taking some measurement flights over New York and other urban areas during the pandemic to try to answer similar questions like that. But at this point, for my research, we're still focused on understanding nitrogen. But two months ago, I stepped into the role of acting director of my lab. So my focus for the last two months has really been on helping my team navigate work and life during the pandemic and ensuring that we're still collecting our data as best we can and carrying out science as best we can during some really challenging conditions.

MG: I bet. And I'll ask you more about that in a little bit. But just to back up, you became the deputy director in 2016. How did that opportunity come up? Can you say a little more about that?

LM: Sure. We had an individual who decided to relocate, still with ARL, but decided to physically relocate. So in that position, I was able to express my interest in serving as deputy because it was something that I had always seen as an opportunity to learn and grow and learn something new. I stepped into that role, and it really, for the last three years that I've served in that role, has been just an outstanding learning opportunity of – how do laboratories work, how

do line offices work, what is behind the scenes that support the science, and how important that is. It's critical that we have strong administrative processes, that we have a very thorough budget and accounting, and all of these other aspects of work. Because if we don't have those in place, then we're not able to do the science. I've learned so much about understanding the value that those teams bring to the table when it comes to supporting the overall mission of NOAA and of our laboratory and division.

MG: What were your duties during those few years as deputy director? Who was the director you worked under?

LM: So I worked under Dr. Bruce Baker, and it was really learning how to work in teams and lead teams, particularly for the blended workforce because where we are, we have some federal employees. We also have employees from a cooperative institute and employees from a university consortium, postdocs, summer students, and interns as well, all in one workplace. So how do we work in teams that are matrixed across all of these different employee types and still be successful? I think that was one part of it. I think another part of my job was really trying to understand how we are being accountable when it comes to performance measures and milestones for a lot of the work we do. I think we advanced the work. We know we're taking future steps. We're always worried about where the science goes next. But are we going back to the initial plans that we have for those projects and programs and understand how we are systematically advancing things? Then, are we measuring those? Are we being accountable to the performance measures and milestones that we set out for ourselves when we started the project? So I had a role in that as well. Then also, this is where I've learned more, not only about project budgets and research budgets but understanding laboratory budgets and how you have incoming funding. You have to be able to understand what your projects are, programs, human capital, and ensuring that you're being fiscally responsible with the resources that you're providing.

MG: Is ARL aligned at all with the Environmental Protection Agency [EPA] in terms of direction and programming?

LM: We are not. I think we have partnerships with EPA. We used to have a division of ARL that was actually co-located with EPA. But that's probably been ten or more years since we had that group there.

MG: I didn't know if the nature of ARL's work or mission changed in the last four years when the EPA has rolled back a number of clean air and emission standards.

LM: It really didn't impact us that much because we're on the observation side. EPA has the policy folks. We're still on the observation side. Even though there may have been policy changes, we're still collecting observations. We're still doing modeling in order to advance the research side.

MG: Has the modeling changed quite a bit in the course of your career?

LM: Yes, I think so. I think when we look at just the impact of supercomputing, just how much it allows those models to be more comprehensive and to look at global change because now you have the computing capability to be able to do so. I think that has really been an advancement that's probably unlike any other when it comes to weather modeling and climate modeling, is having those computer advancements and being able to run even more simulations even more quickly.

MG: It was just this year that you took over as acting director.

LM: Correct.

MG: What has that been like for you?

LM: So I'm two months in, and it's been interesting and fun in some ways and a really great learning experience in other ways. I don't think I could have foreseen that I would have stepped into this role in the middle of a global pandemic. For me, having those daily dynamics with my team – I really miss being in the office in person. It's made me be a little bit more creative about how we interact and using tools online, like Google Meet, Zoom, and all the other platforms, so that I stay connected to them as well, even though we can't physically be in the same place at this point. That's one thing that I have learned is just ensuring that I'm touching base with folks, whether that's on video, text message, email communication so that they that we have communication back and forth that's ongoing. Stepping into this role at this time has made that more important than ever, and I try to be really cognizant of reaching out to my team and making sure that I'm talking with not only the supervisors but the team members on a regular basis.

MG: Before the pandemic, you were doing some really great outreach and education programs with schools.

LM: Yes.

MG: So I wanted to ask about how that started. I didn't know if it was inspired by your educational background and your parents being involved in schools or if it was an ongoing effort at ARL.

LM: It's something I've always been interested in because of my educational background and something that I have championed ever since coming to ARL because I think we have really great resources that sometimes the community around us has never even heard of. I was active in promoting for our scientists and engineers to visit classrooms in their communities and talk about the work we do. We even had our first "Take a Child to Work Day" activities – I think this was two or three years ago now – that I spearheaded. Our lab, in our history since 1948, had never participated in that. So I was really excited to have our staff bring their sons and daughters in work to see the different activities. We set up little science experiments for them. We had activities outside. It was a fun day for everyone involved. I think it really helped bring our team closer together. It helped their kids go out to their friends at the end of the day and tell them about the cool activities that their parents are working on when it comes to their work at ATDD. But it's just something I have always had a heart for because I think about the activities I was

exposed to in K through 12 and through my parents when it comes to science. I want other kids in our communities across the country to be able to have those opportunities to hear from a scientist, particularly kids who are from underrepresented communities, because, I think, for so many children, when you say "scientist," what they picture in their mind probably is not someone who looks like me. So I want them also to be encouraged to think of science, whether it's meteorology, environmental science, atmospheric science, as a career path for them, that there are people that look like them that study the environment in many different ways, and that that's a curiosity that they can transition into a career.

MG: How do you facilitate these programs with the school? How do you set those programs up?

LM: It goes in two ways. Sometimes the schools are having large science activities – science fairs, science days – where they reach out to our laboratory. We always do our very best to accommodate those requests and have some of our scientists and engineers show up and participate in those activities, which is always fun. But then also there are schools and activities that we have partnered with for a long time – local, regional science fairs, other activities – where we have been participating for a long time. So we always seem to just be on the docket for speakers for those. We bring hands-on activities. We bring small wind instruments. We bring different things where the kids can actually have that hands-on experience and touch scientific instrumentation. It makes it much less of an abstract concept. It's something that they can feel and touch and hold and then understand the dynamics and the processes for how those work.

MG: Have those programs continued, or have they been on hold this year with COVID?

LM: Unfortunately, everything has been on hold this year with COVID. We did have teachers who reached out to us for different activities, but then all of the schools closed in the spring, and those activities were canceled. What we've heard from a lot of the teachers and Boy Scouts and Girl Scouts groups that we work with is that they're just in a holding pattern to see what happens next year, and then hopefully, in 2021 or 2022, we'll be back on schedule to visit with them.

MG: Would that be something you'd continue to do as acting director?

LM: Absolutely. It's so much fun. There's an activity I always did whenever I went into a classroom, particularly with elementary kids, is I'd asked them to take a deep breath in and then take a deep breath out. Then take another one in. And then I would always tell them – I said, "The air you're breathing in was in somebody else's mouth." Of course, the little kids always go, "Ooh, that's so gross." [laughter] It has a new connotation now in the pandemic, but it helped them think about the fact of how air is such a shared resource for us. The air that's in our town is not limited to our town or our state or region. It's a shared resource around the globe. So we all have a responsibility to help keep it clean.

MG: There have been a number of big events that have impacted air quality in major ways. Have you or your office looked closely at them? I'm thinking about things like 9/11 and the

Deepwater Horizon accident. Are those things you've looked at personally or had folks in your office look at?

LM: I have not personally looked at them. But I would say, *Deepwater Horizon* – we do have other scientists in ARL who were somewhat involved in those projects. We do, in ARL, have a group that looks at volcanic eruptions and that impact. They are doing modeling around those different types of events. We also have modelers who are looking at the impacts of dust events and how those impact human health and environmental health around the globe. Then the Fukushima accident that happened a couple of years ago, we have a group that was very involved in trying to understand the dispersion of materials from that event. So not my personal area of expertise, but we do have others in ARL who are working on that.

MG: Sorry to bounce around a little bit. This just popped into my head to ask about. You've talked about folks that have mentored you, and then also your work in schools. So are there students that you've been a mentor to, and you've seen them pursue an education or career in science?

LM: I actually have several students I've mentored. Some of them are still – I have students I've mentored as undergraduates who are now in graduate school pursuing their doctorate degrees. I have students that I mentored and that were in graduate school; I served on their dissertation committees, and now they're out employed as scientists and as educators. That's another thing that I enjoy is pouring into the career of young scientists and seeing that person navigate their career and navigate the world and come to their own in, in whatever discipline they choose. Some of them are in air resources in atmospheric research, and some of them have taken the route of going into higher education. It makes me proud to see the next generation of scientists and what they're doing because they just have so many of them, a different approach, a more community-based understanding of what the science means. I see that as being really beneficial for our work.

MG: In the year before the pandemic, what was your strategic plan or goals and projects you were working on?

LM: Sure. So I had started with a postdoc, actually trying to understand some of the dynamics that happen not only in coastal areas but in urban areas when it comes to dispersion and how pollutants travel through the air. We had partnered with some folks through a postdoctoral fellowship that she has with the intelligence community, which was a group that I had not previously worked with before. We started working with a group from IARPA [Intelligence Advanced Research Projects Activity] because they had an interest, too, in understanding how particles and gases get dispersed in urban areas. So that's something that we've been fostering over the past year because our laboratory has measurements across the Washington DC capital region. So we have those measurements in place and have for years, but we're just utilizing and looking at that data in a different application. So that's something that we've been working on probably for the last year and a half or so.

MG: So what has shifted, and how have you adapted since the stay-at-home orders?

LM: I really think what the major shift has been – all of our field research activities where we would actually be traveling to different sites and locations to take measurements – all of those are temporarily on hold right now. Now, our long term network measurements, they're still continuing. We've been really intentional about working with local site hosts in the areas to ensure that those measurements stay up and running. So far, so good. We haven't had any catastrophic failures on that front. So that's been good. I think what we're taking this time to do is to ensure that we are publishing and presenting the work that we have previously done because sometimes it gets to be really difficult to fit in: how do I continue to write that paper and develop that presentation when I have a new project on the horizon, where I'm excited about starting that as well? So this has given us some time in order to wrap up loose ends and make sure that we have final products from a lot of the work that we've had in the past. But then it also has given us the time to plan for the future. I'm involved in meetings right now [about] if we're able to get to a point where we have the opportunity to do field observations in summer 2021. What will those look like? Will we still have travel restrictions and precautions? How are we able to deploy instruments? Just [inaudible] the logistics of discussing all those. So it's given us time to develop more comprehensive plans and alternate plans, too, because we want to make sure the science continues.

MG: Yes. I'm finding that one of the few silver linings of this time is to be able to reflect on our life and work and make wish lists for the future. Are there certain projects or studies that are on your post-COVID bucket list?

LM: Yes. [laughter] We really want to repeat our coastal study. We did a short study. We took about a month's worth of data and have analyzed that. We've written the papers up for it during this time and have submitted those for publication. But what we realize now is there are so many more different types of measurements we would add to our suite of instrumentation. We really want to be able to measure not just over a month's time period but maybe over a season or inter-seasonally. What are the logistics for being able to do that? So I think we're taking lessons learned. We're also taking those – if we have an opportunity to partner with someone with a different instrument, where could we go to take this really comprehensive set of measurements in a coastal ecosystem? We've developed the initial plans for what a study like that would look like.

MG: I read somewhere an interview you had given, where you're asked, "If you could invent any tool and cost was not an issue, what would it be?" You said something that would measure multiple pollutants in real-time. Can you describe what you meant, and then what the current technology allows for?

LM: Yes. So the way our measurement suites typically work now is that we have an instrument that measures one or sometimes, at most, two different chemical species. We're able to deploy those. The challenge gets to be: we really want to understand the interactions between chemical species because there's a lot of relationships between those. So it would really be ideal if we could measure a suite of, let's say, ten species with one instrument. That helps when it comes to footprint space. It helps when it comes to power limitations because we are very limited by power requirements a lot of times in the middle of these fields where we're collecting data. So if we had one instrument that we could deploy to measure a suite of ten or so species, it'd be really

ideal. I think that technology is moving toward that. But a lot of the multiple species monitors and sensors that are available now still require a lot of power, in some cases, a water source, depending on the technique that's used, and/or sometimes they have to be in a climate-controlled area. So you've got to have a building or a structure where you're keeping the temperature relatively consistent. But if we had an instrument that was robust enough to be deployed in the field, under different temperature receives, didn't have to be climate control, did not have a huge footprint, but could also measure a large suite of different trace gases and particles at one time, it would be ideal. I think the science is moving in that direction in general, but we're not there yet.

MG: You've done so much in such a short period of time. Looking back over your career, I'm curious if there are stories or moments that stand out to you.

LM: Oh, gosh. There are so many. It's hard to pick some. I think the stories that stand out for me most are the interactions I've had with people. The science is always fun and fascinating. But some of the most fun and interesting discussions I've had have been being at field studies with individuals, sitting down to talk science at conferences, just these informal interactions with people and learning their stories and what brought them to the science and hearing their perspectives on different ideas of how research advances, or the work that we're doing, has been really valuable. I think the other thing that has stood out for me in the course of my career is understanding how diversity and inclusion have become much more appreciated and understood more broadly across the geosciences community. In the last couple of years – I think there have been people who have been working on these issues for decades and laboring in their quiet corners. But I think now, with where we are in our country and our world, we understand even more the value of a diverse team and an understanding that people bring unique and varied perspectives to the table. We need to have a table big enough to accommodate everyone.

MG: Yes, that's nicely put. I'm wondering if there's anything I've missed up to this point. Are there certain elements of your career or something I've forgotten to ask about so far

LM: I guess the one thing I would add that we probably haven't talked a lot about is for me, family has always been important, and that was a different aspect that I saw as a scientist who is a wife and a mother. Also, I've had to make hard decisions over time about where I could put my energy and how long I could be on a field experiment because I didn't want to leave my family. I've made conscious choices in my career to stay in Oak Ridge, to stay at ATDD because I like this area, and it's been really a good place to raise a family and to have children. Sure, I could have probably pursued different job opportunities in different cities in different regions, but it was my conscious choice to stay where I am, to allow me to have that the work-life dynamic that I needed and that my family needed at the time. So I don't want to ever discount that because being a parent as well as a scientist is tough, particularly now with where we are with school and education. But I think we have opportunities to be successful wherever we choose to be and giving young scientists the ability to understand that they don't have to make either/or choices. Sometimes you can make both/and choices.

MG: Yes, I think that's really important to consider. It sounds like you've had a win-win situation with your work and family.

LM: Yes.

MG: How has working from home with your family been this year?

LM: Oh, I tell anybody, it was probably the toughest thing. [laughter] When the kids were first out of school, and we first all landed at home, my kids and I, it was difficult. My husband has never stopped working during the pandemic. He's always been going into work because he works in juvenile justice. So working from home was not an option for him. Having that dynamic of the three of us at home all day and me trying to work and them, at first, trying to navigate what their dynamics with their teachers and their schools look like was tough. Over the summer, I think we settled into our groove of they understood when I had to work, but I've been really clear since school started, I have a daily schedule. My kids are in school in person right now. So there are times in the morning where I'm doing drop off, and there are times in the evening where I'm doing pick up, and I have that blocked off on my calendar. I've had to be really concrete about the fact that those are non-negotiable times for me. I can't meet, for example, from three to four on any weekday because I have to pick up my kids from school. I'd say, for the most part, everybody's been pretty understanding of that. But I realized it was a boundary I had to set for myself because it's really difficult to do school pick up for two kids and still be on a conference call at the same time. [laughter]

MG: [laughter] Yes, I understand. Well, part of this project is to celebrate NOAA's 50th anniversary. Do you have any final thoughts about NOAA as an agency and its history or legacy?

LM: Yes, I think NOAA has grown so much. I see just the people that we have in the agency, and the contributions they have made over the years have been outstanding. There is such value in the fact that NOAA just isn't in Silver Spring or DC. NOAA is in Oak Ridge, Tennessee, Miami, Florida, Idaho Falls, Connecticut – all across the country, there are these offices where people are dedicated to the mission and the work they do and are enthusiastic about how they contribute to making the agency even better as we move forward. So I think that's been a big benefit. I also think that when we look at how we're bringing people on board into the NOAA workforce and ensuring that our own community as a blended workforce reflects what this country looks like, I see the advances that we've done in that and the work that we have to do. That's something to be proud of, as well, at this point.

MG: I have gotten to the end of my questions unless there is anything else.

LM: I can't think of anything. [laughter]

MG: Well, it's really been such a treat to meet you and hear about the work you're doing. When I send out the transcript, that's an opportunity to add things in if there's something we left out.

LM: Okay, that sounds good. I appreciate it.

MG: Yes. Thank you so much, Dr. Myles. This has been a lot of fun for me.

LM: Great. Thank you so much. If you have questions, feel free to send me an email.

MG: All right. Sounds good. Have a good weekend.

LM: All right. Thank you. You too.

MG: Bye-bye.
----------END OF INTERVIEW----------
Reviewed by Molly Graham 1/17/2021
Reviewed by LaToya Myles 2/4/2021
Reviewed by Molly Graham 2/5/2021