

DR. S. MCKENZIE SKILES

**An Interview by Sophia Blankevoort, Sadie Gregory, and Nate Roberts
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**Women In STEM Digital Collection Project
J. Willard Marriot Library
Special Collections Department
University of Utah**

This is the first of two interviews with Dr. S. McKenzie Skiles

SG: We're just going to start off just with a little bit of your early life background. So where did you grow up and then how did this influence your future in the outdoors?

MS: Yeah, so I grew up in Anchorage, Alaska, and I spent a lot of time outside. My parents raised us skiing and biking and just spending a lot of time outside and over sort of the timeframe of growing up I saw changes happening sort of in the natural environment around me in Alaska that you usually wouldn't be able to see over the course of a lifetime. Just glaciers receding, permafrost melting. Less snow in town every winter and so when I wanted to, when I was thinking about what I wanted to study, climate change was really my like first choice. I picked the University of Utah I mean, mostly because it was close to the mountains. So I could also ski. But then once I picked the University of Utah for my undergrad, I was able to sort of explore how I could within a very broad field of climate change, like what would I end up doing with that or how would I focus that.

SG: So you were influenced by just watching the climate change. Is there anything else you wanted to be when you were a little kid?

MS: Yeah, I think I had, you know, I think like many kids, I had different ideas over time sort of just depending on various interests. I think at some point I thought I wanted to be a doctor and that didn't last for very long. I think since I did some science projects in junior high that just were really interesting to me, more interesting than a lot of other things and that sort of narrowed in and knew I wanted to do something around science for sure. So it was always sort of within the broader field of science. And then I kind of got more and more specific over time.

SG: Did your parents have any influence on a STEM specific career?

MS: Oh, that's a good question. My dad was a math teacher. And always kind of just, we played with a lot of puzzles and he always just asked us lots of questions about sort of what we were thinking and helped just sort of explain what we were thinking about. And so I think his way of fostering our curiosity about the world and making us think a little bit more about it probably had a lot to do with me going into an environmental science field.

SG: So along with that, it sounds like your dad was pretty supportive of you exploring these, but did you have any other family support or lack of any support on your way to your career?

MS: That's a good question. Emotionally, they were all very supportive, but I come from a big family. There's six kids and my parents never really had very much money. So I knew that if I was going to go to college, I was going to have to pay for it myself. And so financial support is always a big part of whether or not you go on to higher education and so that that was one challenge that I had to figure out how to overcome. But generally, my family and parents were always really supportive, even if they didn't fully understand always what I was studying. They were supportive.

SG: How many of your siblings went to college?

MS: Out of six, four of us have gone to college and have gone on to, my brother's a lawyer and my sister is a community college professor. And then I have a younger sister who is doing her master's right now. So of the four of us that went on to higher education, we all have done some level of graduate school.

SG: Did you have any specific female scientists that you admired while growing up and did they have any effect on you if you did have any?

MS: Oh, that's such a good question. And the answer is no, I didn't. I always kind of felt like I was forging my own path and that I didn't really have many women, especially in the field that I'm in now, snow science, many women to look up to or interact with and I when I got farther into graduate school I kind of sought people out and I did end up finding people. But when I was still figuring out what I wanted to do and going into graduate school, there weren't many women, or many women that I was aware of.

SG: Did the lack of role models inspire you in any ways? Or do you think it ever deterred you from STEM or was it pretty neutral?

MS: I don't think it deterred me. I mean, luckily I mentioned my dad. I think I'm very fortunate to have a dad that made me feel like or never brought up the the fact of like you can't do something because you're a woman. He's like, basically, you can do anything you want to do and that was really helpful, but I definitely had teachers in high school and even in college that would make assumptions about how far you would go in school or in your education and they would say things offhand like: Oh, maybe you don't have to worry about that because you won't need it in the future, assuming you're not going to go into being a scientist and so just offhand comments that sort of make you second guess if you're able to do something. But mostly I didn't really let it deter me. I mean, there definitely were those people and it would be disheartening but I just kind of knew what I wanted to do and just kept doing it.

SG: That's about it for like the early part of your life questions. Do you have anything else to add? Any stories or anything you think is notable that led you to this career or shaped you as a person?

MS: I can tell a story. And it's funny because my original, my first major at the University of Utah is actually Biology and I ended up switching to geography. I had an advisor, an undergraduate advisor, the person you go and ask about classes and I... was... How do I say this? I was interested in Biology, but I wasn't really that dedicated to it. And I also was at the University of Utah and really like to ski so I kind of missed a lot of classes because I was skiing a lot. And my undergraduate advisor basically told me that he didn't think I would make it in Biology. He's like, I don't know if you're going to do well and I look back on it now and it was kind of rude and a little dismissive and not supportive at all. And I ended up taking a geography class that I loved and moved over to that department and ended up doing really well, but I always think back on that and think how would my future look different if I had stayed in Biology, but there's always sort of those forks in the road. And I don't know if that had anything to do with me being female or not, or just he saw someone who skip class every now and then. But that was that was an interesting aspect that could have led to me doing something totally different with my life if I had stayed in Biology.

SB: Okay, so kind of going into undergraduate and graduate school, you said you talked a little bit about why you chose the University of Utah. Did you choose the traditional four-year path with biology and then switched to geography or was it different in any way than the traditional path?

MS: No, it was pretty it was pretty traditional. I actually did the first year of undergraduate or my first year of college was at the University of Hawaii, because I thought that I wanted to surf. You don't know what you're really wanting to do when you're 18. And then I switched to University of Utah because I missed the mountains and I missed the snow. And I had some family in Salt Lake. I did sort of the traditional path once I found Geography, I double majored in Geography and Environmental Studies but it was pretty straight through four years of undergraduate.

SB: When you were applying for universities, was the University of Utah your dream school or did you apply to others that you had hoped to go into, apart from University of Hawaii?

MS: I did apply. I did apply to some others and now of course I am not going to remember where else I applied but I think schools in Colorado and schools in Utah and then I think some in the Pacific Northwest and they were all somewhat close to mountains because just being able to get outside and go skiing or go trail running or go climbing was an important part of picking where I wanted to go to school.

SB: Okay, and then I believe you did your master's at UCLA? What drove you to kind of apply there, and what made it stand out to you?

MS: Yeah, so I did my master's at University of Utah in the geography department, and then I did my PhD at UCLA. And what drove me to go to UCLA was a couple of different things. One is I knew that potentially one day I wanted to come back to the University of Utah as a faculty if I could figure out a way to do that. And it's not typical to get hired as faculty at a university, if you did your PhD there. So I kind of had in mind that I needed to go somewhere else to do my PhD if I wanted to ever come back to the University of Utah. And then another reason why I picked UCLA is I had an opportunity to get my PhD funded and it's just a really great school. I wasn't super excited about living in LA for four years, but it was a great opportunity and so I went for it.

SB: So did you participate in undergraduate research when you did your geography degree at the University of Utah?

MS: Yeah, I actually met my graduate advisor when I was in undergrad. And I knew that I was interested in snow, but I didn't know snow hydrology was a career that people had and my graduate advisor was a brand new faculty member in my senior year in undergraduate. And so I met him and studied basically exactly what I wanted to study. And so I did do some undergraduate research with him that my senior year and then went on to be my master's with him the following two years after I graduated from my undergraduate.

SB: What do you think was the biggest challenge that you faced in undergrad?

MS: That's a good question. I don't want to say that there weren't any challenges but I can't think of many. I really enjoyed going to school and being in the environmental studies and geography department. I sort of found that being in those programs gave me the exact tools that I needed to do like what I wanted to do in the future and then of course, you know, Salt Lake is a great place to live and I was skiing a lot and it was so I had an overall like pretty great undergraduate experience.

SG: That pretty much concludes the questions that we have for undergraduate. So then we've already talked a little bit about your grad school and PhD. After you met your advisor, were you pretty set on doing your master's at the U or did you look into anywhere else?

MS: I did not look into anywhere else for my master's. I had a project idea that I really liked and I guess before I met him, I had considered applying into other programs that weren't snow related. But once I found out that I could do a project around snow I sort of just committed to that track and didn't end up applying to graduate school anywhere else. By the time I decided to go to graduate school, the applications were due within a couple of weeks. I basically just rushed to put it together and get it in on time.

SG: What did you do your project about?

MS: My master's project was focused on comparing the impacts of climate warming, so warming air temperatures, to the impacts of snow darkening or dust deposition on snow in a study area in the upper Colorado River Basin, so the San Juan Mountains in Colorado that now we know get dust deposition every year, but at the time this was a relatively new topic that hadn't really been well studied yet. We didn't know really at the time what would be having a larger impact on snowmelt. Would it be increasing temperatures or this impact of darker snow from dust deposition. So the focus of my master's research was doing snowmelt modeling, looking at the relative impacts of dust and warming air temperatures and then the two of them in combination and seeing what had a bigger impact on snowmelt.

SG: With your project and everything you did for it, is there anything that stands out that you want to share?

MS: Yeah, sure. The outcome of that paper was that dust and snow darkening had a much larger impact. Then warming air temperatures, which I think was surprising to many people and maybe even surprising to myself because I went in to graduate school and was pretty insistent to my graduate advisor that I was studying climate change and that I was studying the impacts of air temperatures on snow. Then this other topic sort of came up and it had such a really big impact on snowmelt and the way that my experiments were set up in that paper had ended up getting a lot of attention. I won a big award, an editor's Choice Award for the first peer-reviewed publication that I had ever published. And to give a lot of credit to my graduate advisor because a lot of it he helped me set up but that was really exciting. I think that award potentially motivated me to keep going in research. I think, you know, recognition and support is a big reason of why I decided to keep going in science.

SG: What do you think was the biggest challenge you faced in grad school and/or your PhD?

MS: Oh, I think being a woman in a male dominated field. It's gotten better over the last decade, but at the time, there were very few women in snow science and snow hydrology. It wasn't my graduate advisor, who was very supportive, but other people in the field that would just be dismissive or assume that I would not be able to do field work or I wouldn't get invited to do field work because everyone else going would be male. I feel like I've missed out on opportunities. And then also people just giving my graduate advisor credit for work that I had done, which I always found pretty frustrating, but he was very good at recognizing or pointing out that it had been research that I was doing. So that aspect, I like to think that it's gotten better, but when I first started it was pretty rough.

SG: Do you think there's anything you had to change about yourself to try to fit in, in the male-dominated industry?

MS: I think so. I think that a lot of people, especially when you're out of a professional setting and even when you're doing field work, you're working. It's not quite the same setting and people tend to say things they maybe wouldn't say if they were back in the office. Men would just say really sort of dismissive and rude or even offensive things and I would just pretend to ignore it or not hear it or pretend not to be offended or I just would never say anything because I didn't want to rock the boat or be difficult. Especially when I had to kind of force my way into getting those experiences in the first place, I was just always afraid of being like...why did she end up coming she's difficult. We're not going to invite women anymore or something like that. I think I probably should have spoken up sooner because now that I'm more established, I'm not afraid to say something but when you're in graduate school and you're new to everything, it can be really intimidating to bring it up.

SG: Did you see other graduate students like yourself that were male that were getting the appropriate credit when you were passed over?

MS: Yes, yes. I feel like I always had to work, maybe not twice as hard, but always had to work harder than male graduate students who are at the same level as me. I had to present better and publish more and still didn't feel like I got as much credit as male colleagues sort of at the same level or similar career stage as me. And honestly, that still happens. That's something that has not changed over time, which is really unfortunate, but it's a little sad to say this, you just get used to it men getting more recognition than women in the field.

SG: You mentioned earlier that there weren't any women that inspired you when you were young, and that you said you kind of had to seek them out. Was there anybody in graduate school that was a female mentor to you or that you looked up to?

MS: Yes, yes. I had some amazing female mentors in graduate school and a couple of them were doing collaborations with my graduate advisor. Then I got the chance to work with them, and then kind of just put in effort to keep working with them and maintain relationships with them. I got to a point where I felt comfortable enough to ask them for advice that didn't have anything to do with research necessarily but just career advice or, how would you handle the situation. So I was really fortunate to find a couple of strong female mentors during specifically my PhD that are still mentors and friends today.

SG: Did they give you any advice that sticks with you in your life today?

MS: Yeah, one piece of advice that I still think about a lot is one of my mentors, she said “Women are always expected to take on more service roles. So volunteer your time to lead a group or even silly things like women are always asked to take notes in meetings if you're the woman in the meeting.” And she said, “be selfish with your time. Don't take on these roles just because you're a woman, your science is just as important as everyone else's and don't let your time be taken up by these roles that people assume you should take on because you are a woman.” And that has been really valuable because you sort of give yourself the freedom to say no to things um that don't advance your career and that male colleagues don't feel like they have to take on. So she just said, “...don't think about it any differently. Just say no if you don't want to do something.”

SG: So as having worked as a research assistant in graduate school, is there anything you've implemented into your research today because of that?

MS: Maybe not in my research directly but just in my broader research program. Some lessons that I have taken with me from stuff that I learned in graduate school is to now be supportive of my female colleagues to sort of offer the same support that was offered to me, and to make sure that when i'm doing my research that I give recognition to female colleagues. As one example, if you're writing a paper and citing other papers, what frequently happens is that male colleagues get their paper cited more often. And I just try to be very aware of if there's a female colleague who has done that work to cite them. And then if opportunities come up that would benefit them to just loop them in and sort of just get a community of female snow scientists and snow hydrologist going that can all support each other.

SG: Did you find a community either in undergrad, graduate school, or in your research that was less of a mentor figure and more of like peer figures. Women who are also in STEM fields who are pursuing maybe similar research positions?

MS: Yes, I think less so during my graduate degree, but once I moved into my postdoctoral research, sort of the research that I did in between grad school and becoming faculty, I found women that were at the same career stage as me and that could have been either working directly with them or at conferences. And that was also super helpful just to hear their experiences and how they were the same or different than me. Then just to watch how all of our careers have evolved and then make our field a more comfortable place for women that are coming into the field after us, and being able to talk amongst ourselves and saying how do we make new graduate students that are coming into this field feel more comfortable and supported? And luckily, over time, more women have started coming into the field of snow hydrology. And so I like to think it's made a difference. It's hard to quantify but I think change is happening even if it's a little slow.

SG: More about your PhD. Why were you drawn to UCLA? And then what was the process like and why was it your first choice? If not, was it the right choice?

MS: Yeah, great question. So my graduate advisor during my master's actually got a job, not at UCLA, but at NASA JPL. He had funding for a research project, but you can't be a graduate student at NASA

GPL, because it's not a school. And so he said, if you are willing to apply to UCLA, I have funding for a PhD project. That was an opportunity that I just couldn't pass up. To find a fully funded PhD as a research assistant can be challenging and so I applied to UCLA, and I had to have an advisor at UCLA, and there's a soil and dust scientist there that ended up being my advisor. So I had a really unique experience where I was studying impacts of dust on snow and had two advisors, one who studied dust and one who studied snow. And that really was a unique opportunity and I couldn't say no to it. It was just such a great opportunity it was worth moving to UCLA. And then, of course, UCLA is just a great school and has a great geography department and that was a bonus, of course.

SG: You mentioned how there's a lot of exclusion when it came to field work or getting credit for things. Are there any other times when you felt discouraged?

MS: Oh, yeah. Well, I will say that graduate school is challenging. It takes a lot of time and you don't get paid very much money. I mentioned previously that I don't come from a family with a lot of money and so just getting discouraged, whether it be from feeling excluded or just the general challenges of doing graduate work and questioning whether or not I was making the right decision because I was just poor all the time, just didn't have very much money. In graduate school, they pay for your tuition and they pay you a little bit of money, but not very much. It's not enough to save. It's not really enough to buy a house or it's just kind of barely enough to get by. And it takes a long time. I finished my PhD at the end of my 20s. So it's and it's a big commitment. So it's sort of all along the way asking myself if I was doing the right thing. I think that it turned out okay, but when you're in the middle of it, it's scary. It's just a big big, scary decision to make.

SB: So going back really quickly to your undergrad or graduate, did you TA a lot when you were a student?

MS: I TA'd for one year, my first year of my master's, and then all the other years I was a research assistant.

SB: So I'm going to touch a little bit on how you got into research. What were the specific step-by-steps that you took to kind of get into that as an undergrad?

MS: I was in the geography department. I was really interested in getting research experience because I didn't really know exactly what that meant, like what was involved in it. So I was looking for a faculty member that I could do research with and just get a better feel for what that looked like, and if I would enjoy doing that myself.

So I did a couple smaller projects, both kind of related to snow and they weren't huge research experiences. They were little, but it was enough to give me an idea that I really liked the process of thinking about a problem, coming up with a way to collect data to answer that problem and then understanding if my initial thinking about it was correct or not and that the scientific method, we learned about what that is but I had never actually put it in place. I found that I really enjoyed that process, even on a very small scale. And that was enough to motivate me to do my master's, but at each step, I was like, I'll do this and then see if I still like it. I didn't know when I went to do my master's that I would do a PhD. Or even that when I did a PhD that I would end up becoming a professor, I just sort of each step along the way was like, oh, I'll do a little bit more and see if I still like it. And then it kind of ended up with me

doing research forever. It was sort of a building block process. And not fully leaping in and knowing exactly what I wanted to do. the whole time.

SB: There weren't any programs like UROP or SRI that you pursued? You completely did it by yourself by reaching out to just professors that you're interested in?

MS: Yeah, I just reached out to them. I now work with UROP students and I think it's a great program, but honestly, I don't think I knew it existed when I was an undergrad. I didn't know about those resources. And if I had known about them, maybe I would have been able to start a little bit sooner because I kind of fit in these research projects in the last semester of my senior year or at the end sort of as I was trying to figure out if going to grad school was the right thing. I wish I had known about those types of resources as an undergrad, but I don't know if that was just kind of clueless, or if that information wasn't really clearly provided to me. I can't remember, but now that I work with undergrads in those programs where they can be provided funding and opportunities to present their research to a larger audience. I think it's an amazing program.

SB: So after you graduated from your undergrad, you went straight to your master's, no gap. Is that right?

MS: Right.

SB: Did you ever consider doing a gap year and working independently?

MS: Yeah, I did consider it, I guess not very seriously because I didn't end up doing it. I did, between my undergraduate and graduate for the summer, worked as a GIS analyst for the Utah Department of Transportation. And that was really more of an internship, I'm glad I did it because that was always an option that I had gotten a GIS certificate and I had these mapping skills that if I didn't end up liking research, I can always go the route of getting a job in GIS and mapping. So I'm glad I spent my summer doing that and that helped me realize that that wasn't really where my passion was. I wasn't that excited about the work. That really helped motivate me going into grad school and being more interested in research.

SB: Thank you. You mentioned that when you went to your PhD in UCLA, you knew that you wanted to come back to Utah. What was it? Was it the research that you had done in your master's and your undergrad that you really enjoyed, or the snow and the mountains that you wanted to come back to? Or was there another reason?

MS: I love Salt Lake City for a lot of reasons. I think it's a special place. I was open to going anywhere with mountains; being nearby mountains was important to me and getting a professor job can be really challenging. You don't know exactly where you're going to end up so I had sort of dreamed of coming back to the University of Utah, but was open to going to other places. Here in Salt Lake you can get up into the mountains really quickly but you can also get down to the desert and there's just so many cool landscapes and outdoor opportunities so close to the city that I think Salt Lake is probably one of the best places to live in the Western U.S. and I've only lived in Alaska and the Western U.S., so I guess I can't really speak to other places, but I think in terms of

what you can access and the size of the city, there's just so many good things about Salt Lake. So, I had always hoped to come back here, even if I wasn't sure that I was going to be able to get a job here.

SB: At any point where you swayed during your PhD to stay in Southern California?

MS: No. Yes, I worked, I did finish my PhD and worked at NASA JPL as a postdoctoral researcher for a year. So I ended up staying in Southern California for five years total.

I really liked the research that I was doing at JPL, but I didn't love living in southern California. And it's not a bad place. It just wasn't my favorite place and so when I realized that I didn't want to stay there and make my career there, I was looking for other opportunities and I took a job as a professor at Utah Valley University for a year before getting hired at the University of Utah. I was looking to get back to Utah or somewhere in the intermountain west And just got that UVU job first before the U of U one opened.

SB: Do you see yourself staying in Utah for like the remainder of your career and the rest of your life, or do you ever see yourself picking up and moving someplace else, like Nordic European countries with more snow and desert kind of areas?

MS: I would happily stay here but I also would be open to other opportunities, going elsewhere. It's hard to say what those opportunities would be, but I'm not opposed to moving or changing up what I'm doing, but I'm also quite happy where I am. The answer to that is I guess we'll see what the future holds but I do think that just to kind of come back to being a woman in this field is I do think that women in academia are generally underpaid. And I think that women at the University of Utah and specifically my department are also slightly underpaid. If I'm being totally honest, if an opportunity came up where I felt like I could make the amount of money that I think I should be making that would probably motivate me to leave.

SB: What sort of differences did you see in institutions comparing the University of Utah and UCLA, of treating women in STEM and women in research?

MS: Yeah, that's a good question. I don't have much direct experience, so it's hard to speak to other universities and their policies and how they impact women in science, but just broadly, I think that in STEM and especially in earth science women are undervalued and underpaid. They're expected to do more for less and they're always offered less money. At the start there's numerous reasons people will point out for that, but none of them are fair. So that wage gap between men and women scientists and researchers is a problem that I would love to see get addressed. And would probably allow for more women staying in science because so many want to be scientists and end up getting pushed out of the field of science. If they were getting paid the same as their colleagues or treated the same as their colleagues, it's much more likely that they would stay in science.

SB: The recent bill, HB60, impacted DEI efforts in academic institutions. How have you seen that change women in STEM and women in research since that's been in place?

MS: Yeah, that was disappointing to see because I think there's been broadly sort of a backlash against DEI efforts, but particularly in sort of more red states, like Utah. I think that a lot of times it has to do

with the fact that people feel these inequities in academia and more broadly it's not just women, it's everyone who's not a white male feels like they aren't getting treated equally. And that has so many reasons and so much historic precedence behind it. There was some small amount of progress being made to not really addressing it, but at least talking about how it could be addressed and in sort of explicit terms. Increasing diversity, how do we make people feel welcome, how do we recognize that people are coming from different backgrounds and that that's okay? Then everyone starts in a different place and brings different life experiences with them. Now that you're kind of restricted in how you're allowed to use that language and how we're allowed to talk about making people feel welcome and increasing differences across research and valuing diversity...I think we've taken a step backwards. There's no perfect way to change this overnight but the the best way to make changes are to be able to talk about them and to sort of be reined in on the way we're allowed to label things or talk about things is a limitation, and a step backwards.

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SB: How did you become passionate about the field that you were working in? Do you still feel the same level of passion for your work as when you started or has it changed?

MS: Yeah, my first field season was when I was a master's student and I got to go to Colorado and do multiple field trips to Colorado to this area where we were studying snow. It was a field site that my graduate advisor had gotten set up through a grant before I started graduate school. It was nice because there was a set study area and we got to go back multiple times over this one winter. I was studying dust on snow and that winter ended up being a pretty dusty winter. And so we got to watch dust get deposited. We got to see it in the snowpack and then I got to study the impact of that and being able to see it and experience it

really is what got me kind of hooked on it. I think I'm really fortunate. I feel like I'm really fortunate to be able to do field work. In what I do, because seeing what you study really helps you understand it later when you're just working on it, modeling it. Or looking at it from satellites where it's not as direct. I just like to be able to feel and understand the things that I'm working on and not being able to do field work that first season, that really just got me passionate about snow science and snow hydrology. And I was just amazed that I was getting paid to do that work, to ski around and dig snow pits and collect snow samples. And I think that first year, I was just so excited about it. I was like, okay, well, this is enough to motivate me to get my PhD. That goes back to building blocks one step right after the other. I was like, even if I don't end up doing this forever, if I get to do it for another four years in my PhD, then I'll be pretty happy about it. So that's what got me passionate about it in the first place. Seeing the impact that it had, my first couple of peer-reviewed publications getting cited by people and talked about by people, that kind of kept me excited about the work. It was really well received and that was really motivating. I would say after that how excited I felt about the research would kind of go in waves a little bit after you work on something. I started graduate school in 2008, And so, you know, 15 years of doing similar research, you get tired of it sometimes. But luckily, I have been able to expand out and research sort of broader topics around snow hydrology and not just focus on dust snow. I maintain that part of my research, but I've been able to sort of broaden out and more generally just focus on how much water is held in the mountain snowpack and how do we observe that and model it. And that has kept things

interesting and allowed me to sort of, if I get curious about something, I know I can go and explore it. And that keeps me motivated, seeing something I get interested in and then spending time working on that. And then as I get motivated about that, then something new kind of happens with dust on snow or snow darkening. And then I get to come back to that. And so I think as my career has advanced, being able to work on different topics that I'm interested in just broadly keeps me motivated for keeping working on snow hydrology more broadly.

SB: Were there any other factors that excited you to open up your own lab or that kind of drove you to open your own lab?

MS: Yeah, being a graduate advisor and running a lab, it's a lot of work, but it's probably my favorite part of what I do; is advising new scientists and new snow hydrologists. Watching them get interested in topics and then becoming more independent researchers, I can help them start on their own path, but then they really take it on themselves and become more independent. And that is such an exciting process to watch. Students gaining their own, how they feel and they get excited about it and they want to take it on to become more independent and just feel motivated to spend more time working on these topics without me telling them they have to do it is just a really cool process. I think I didn't necessarily know that when I started getting research grants and funding graduate students but over the last seven years that I've been at the University of Utah, that's really become a favorite part of my position.

SB: What does your work look like on a day-to-day basis? Tell us about what you do and the people you interact with.

MS: Sure. So now it's funny because I talked about how much I love research or getting out and doing field work as a part of my research. And unfortunately, I don't get to do that as much anymore. My graduate students do a lot of the field work now. So day to day I have become more of an administrator and manager of a research lab. So my job is to make sure that I'm applying for research grants and bringing in money to fund new students and to fund their field work and fund the instrumentation we need to do the field work that we need to do. It's funny because I've sort of morphed into more of like a science advisor than the one who's actually implementing and doing the science. That's the graduate students that are really doing the science, which is great. But it's funny to see this evolution from being so excited about doing science, now getting other people to be excited to do science and then just making sure that they're funded to do it. And so that takes quite a bit of time, finding research funding, applying for it. And then managing projects to make sure that you do what you say you're going to do with that pot of money. And then, of course, on top of that, I'm teaching classes as well so it's research and teaching and then other duties that you have to the department and serving on committees and it's sort of a split between all of these things and so day to day honestly looks a little bit boring. It's a lot of time on my computer answering. I have a relatively large research group. I have seven graduate students and four postdoctoral researchers. So being able to work with them and get updates on their research and then help them publish papers, that's exciting and that's the best part of my job.

SB: What has been your favorite research project? That can be something they've done in the past or one of your current graduate or postdoc students projects.

MS: You're asking me to pick a favorite project? Well, first I'll say all of the projects are great, but I think, a lot of my research, graduate research, was focused on looking at the impacts of dust on snow and snow darkening in Colorado and the upper Colorado River Basin. And when I came to the University of Utah, I mean, of course, when I was a graduate student here, I knew that dust was also deposited on the snow in the Wasatch. But when I actually came as faculty here, I remember looking out the window one day and watching dust blow off of the dry lake bed of the Great Salt Lake. And I was like, huh, I wonder how much dust is coming from the dry lake bed because we knew the lake was shrinking. Did an initial study on that, just trying to get a handle on if dust was depositing on snow from the dry lake bed of the Great Salt Lake. And then I was able to get funding based upon that study and fund a graduate student. So really digging in and spending a lot of time looking at dust in the wasatch and the relationships to the dry lake bed of the Great Salt Lake. And it has just been that project being able to do research here in our backyard. And understanding the system that we live in has just been really, that's been exciting and useful for understanding and contributing to more broadly. People are really worried about the Great Salt Lake and to be able to be doing research that's contributing to that and our understanding of that has been impactful and meaningful. So I'll pick that as my favorite project recently.

SB: Building off of that, what direction do you want to take your students' research in future? Or do you have additional research projects in mind?

MS: One aspect of my research lab or group that's really been growing recently is developing snowmelt models that can be implemented operationally to improve the way that we forecast snow melt for end users. That could be someone who's managing a reservoir or a land user who needs water for agriculture. 80% of our water comes from snow melt. So being able to know when and how fast that snow is going to melt makes a huge difference for water users downstream. One of the motivations for developing these models is to account for the impacts of dust on snow, but just more broadly to be able to integrate all these great data sources that give us a really accurate picture of how much snow is in the mountains and when it's going to melt. And that is also very impactful research and has been growing really quickly. And we're working with operational stakeholders like the Colorado Basin River Forecast Center to actually implement our research into their operations. And make a real world difference about how snow melt is being modeled. And that has a lot of potential for growth. And I'm excited to see where we're able to take that research.

SB: Do you think that there are different impacts or relationships between dust and snow in different climates or in different geographies?

MS: Great question, my work really focuses on mid-latitude mountains and those mountains tend to be nearby dust producing regions or large populations that emit a lot of pollution so that can be dust or it can also be soot or black carbon, just sort of stuff that makes snow dirty. But I've been really fortunate to be able to study snow darkening all over the world, including in Greenland and Antarctica. I'm not really worried about this season's snow melt, but more worried about long-term climate impacts if you know they get less deposition. Snow is cleaner, but over time, it's accumulating And it's staying there because it's ice. So it's not melting out every season. It's more thinking on these really long term sort of climactic scales rather than seasonal hydrology scales. Looking at mountains versus glaciers versus ice sheets is really interesting. And that's probably also something that keeps me motivated about this research is just

being able to work in different geographies, different places and where these processes are related, but a little bit different.

SB: Are there other labs at the University of Utah that are similar in the kind of field that you're pursuing with your research?

MS: There are other people that work on snow and ice glaciers in different ways. Some are more focused on sort of the hydrology, some are more focused on climate or snowfall. There's people in the atmospheric science department that are really interested in how snow falls and what controls that process. So it's interesting to see how other people are looking at snow and ice and the way that they're thinking about it and researching it. A lot of that work is very complimentary to the work that my lab does. I feel fortunate to be at the University of Utah where you know, there's a lot of people that think about cold region hydrology or cold region processes And have people to collaborate with.

SB: Does your lab collaborate with those other labs and co-write papers or co-author papers ?

MS: Yeah, we do. I have collaborated quite a bit with people in the atmospheric science department. And then also in the geography department a glaciologist and an ice sheet scientist. So it's great to have people in my own department to maybe not write papers with, but just to talk about snow and stuff with. Then graduate students within our faculty group can collaborate and work with each other. I also have a close colleague in civil and environmental engineering. So that's a little bit more applied snow hydrology, seasonal snow hydrology, mountain snow hydrology, but it's really complementary to the work that we do and we end up getting funded projects together and get to work on sort of that snowmelt model work that I was talking about.

SB: Where do you apply for the majority of your research grants? Is it from the NIH or the NSF?

MS: Yeah, yeah. NSF is one place where we get funding and I do a lot of satellite remote sensing work. So I get project funding from NASA. And then for sort of more applied snow modeling work, a lot of that comes from NOAA. And then some other agencies that I've been funded through or like the Department of Energy, which has an office of science. or the Bureau of Reclamation, which has a snow program to better understand snow melt. And also through the Army, who looks for information if they have to do military-related work in cold environments, they look for information about tools that they can use to better work within those sort of cold region areas. So a lot of different sorts of a variety of funding sources, basically anyone who's willing to fund snow research, I will ask them for funding.

SB: Circling back to your NASA Caltech JPL experience, what was the most valuable thing that you learned from that experience? And going back to your experience as a woman in STEM, how was that experience any different from when you had worked as a researcher in undergrad and graduate school? And were there any experiences that stood out to you in your history?

MS: I think I was fortunate to work with a team that was really great. We were working on this project called the Airborne Snow Observatory, which is basically a plane that flies over mountains and maps how much snow there is using LIDAR. And everyone on the team was really great to work with. But within

the broader group that we were in at JPL, there weren't many other people working on snow. And it was also very male dominated. So I think one impact that that had on me is that I just couldn't foresee myself staying there to work there and make it my career. I didn't see myself working permanently in that environment. And maybe if I had been able to envision that, then living in Southern California wouldn't have been such a hurdle, but the fact that I couldn't see myself working there forever and I also didn't absolutely love living in Southern California. I think those two factors combined motivated me to look elsewhere to continue my research.

SB: So would you say it was kind of a challenge finding a community that you felt supported in? Given like that you're a minority in the male dominated field and there's lacking support in their area.

MS: I think it's like one of the things that makes you know people want to stay in a place that they feel supported and welcome and that they can see themselves advancing. They see areas of opportunities to grow and learn. And I don't know that I saw that there. It was probably broadly just the lack of support and whether that's perceived or real, I don't want to say like it was a terrible place to work because it wasn't, but I just couldn't envision myself being supported and staying there. And I think it probably did have a lot to do with the fact that it was mostly males that worked there.

SB: Personal anecdote for me, my dad worked at JPL from 1990 to 2000, he was an engineer, so not doing research. He was more on the technical side. And I remember he was always saying that it was a great place for women to work, but he never really mentioned any of having any female coworkers. He did know one female engineer, though, who became a senior manager, so I don't know, maybe it's him imprinting on me but or following in footsteps, but going to JPL is also like a dream end goal of mine, working in aerospace and the aerospace industry. So do you think that there's been a rise in kind of policies for inclusion and highlighting diversity and strengthening differences and perspectives and backgrounds? Do you think that sort of the same support was available when you worked there? So less person-focused and more of systemic encouragement?

MS: Yeah, I think there could be a difference here, because I was a postdoc through Caltech, but I worked at JPL and I think that led to a little bit of a difference between like maybe programs or support or mentoring that they would provide to employees of JPL versus postdoctoral researchers that are technically funded through Caltech. Just working on site at JPL and, in general, I think postdoctoral research is a bigger problem within academia because those are temporary positions and there's a lot of expectations on postdocs. And generally lack of support. That's not just a Caltech JPL problem. That's a whole academia problem and so if I had stayed at JPL, maybe I would have found mentors and resources that they had that would have made me feel supported and included. But I think in order to reach that point. I would have had to have felt that way during my postdoc. So maybe there's like a gap in between permanent positions and postdoctoral positions that needs to get addressed more broadly across academia. And, I do think, so let's see, I left JPL In 2015. And since then, the group that I used to be a part of has hired more females. And so maybe if I was there now, it would feel different, and feel like more of a community. For me, rather than just like a place that I worked, because I think that's so important that you have a community. And honestly, all of the engineers that I worked with At JPL all loved their jobs. So if that's the direction you're going then then I think you'll have a great experience.

SB: That's helpful. So expanding on that and applying it to the U of U, one of my previous jobs at the business school is working for the Office of Student Engagement and Belonging. So I saw a lot of the backend support that was given to empowerment programs and EDI before the bill was passed. Do you think that those programs are on the same level of accessibility to people in research as they are to staff of the university And if so, why? And if not, what are the differences?

MS: Yeah, that's a great question. And I don't know that I have a good answer for it. I do think that they have really good intentions of making programs to offer resources to people and make them feel like they belong here, especially first generation students or people from different backgrounds. But, you know. I think as we look at the numbers of the University of Utah, it's predominantly white and white not very diverse. And I think there is a long way to go. Between you know where we're at now and where we would like to be and there are definitely programs, but whether or not those programs get advertised to the people who really need them. I think there is potentially a gap that more work could go into. So I think the resources exist.

I think people or students, scientists, knowing that those resources exist hearing about them and then feeling comfortable accessing them I think that there's probably more work to be done on that side.

SB: Yeah, I agree. So I saw that you were applying to be nominated for a position in the AG.

MS: It's the American Geophysical union. Cryosphere section president.

SB: Yes, what inspired you to apply for that and how did you first come to know about it?

MS: I first came to know about it because I have been involved with the American Geophysical Union. They have a conference every year and that's the main conference that I go and present my research. I became involved in the executive leadership team as a student, as sort of the student representative on it and on it I really enjoyed my experience of getting to see how decisions were made and also enjoyed seeing um how things could be improved or I had thoughts about things that maybe weren't being done as well as they could be. That's also the cryosphere section, which is everyone that studies snow and ice, has actually been very supportive of getting more women into leadership positions, but that hasn't necessarily included women in snow. It's been more women who study glaciers or ice sheets. And so I wanted to apply for that position and I don't know if I will get elected to it or not, but I wanted to apply for that position because I just haven't seen another woman who studies snow in that role. I thought if I could get into that role then that would sort of break down a barrier for more women in my sort of subfield to also go after positions like that, because I just don't think until you see someone that looks like yourself in a position that it's hard to envision yourself in that position. And so I thought I would give it a try. I don't know if I will get elected, but I think it's worth trying. And if I don't get elected this year, then maybe I'll try again. the next time it comes up.

SB: When do you hear the results back about the election?

MS: I should hear next. week. I think they said by the 8th of November.

SB: Nice. Okay, right on. I know you're kind of already touched on this, but if you are elected and put into that position, what sort of policies would you want to implement and what kind of change would you like to drive?

MS: Yeah, one of the changes that I would like to have, well, I said that they've been really good at electing women into leadership positions in that role, something that they've been less good at is giving awards. To women, and there's a couple different awards that get awarded each year and that can be for an early career person or a mid-career person or sort of later stage career people and a couple of years ago during the nomination process for sort of the later career award, not a single female was nominated for the award, despite the fact that there were plenty of women worthy of receiving the award. And so I think the main thing that I would like to address is just equity and who gets nominated and receives awards. So it's finding a way or thinking creatively of motivating people to nominate women in the first place. So at least there's an even number of applicants to consider for receiving awards. And then I think that's like the main thing I would like to work on And then also just more broadly. This is a little selfish, but more broadly representing snow within these fields of glaciers and ice sheets and areas of sort of snow and ice that get more attention. I think snow hydrology is so critical. This is our water source in so many places across the globe. And so just making sure that snow hydrology gets recognized and sort of the same amount of resources as these other fields.

SB: How do you see your day-to-day changing if you're elected into that position?

MS: I'll probably have a lot more meetings to go to to sort of handle that position and meet with people in that role. So I think I would probably have to shift a little bit of my time from my current research program to put energy into that role and do it well. So it probably looks like scaling back a little bit on the number of projects that I have or number of graduate students that I have. And I think that's a fine trade-off if I'm able to make the sort of headways or progress that I would like to make in that role.

SB: Great. And more about the process of that. Is it a termed position? Is it every couple of years that they re-elect a new person?

MS: Yeah, the way it works is it's actually it's a time commitment because you get elected as a president-elect and you are in that position for a whole year and you're working alongside the current president And so you're just a president-elect and then they move out of their president's position and become past presidents and then you become president for two years and in your second year, that's when you're working with a new person that got elected. They're the president-elect. But then after your two years as president, then you become past president. So it ultimately ends up being sort of like four years being in some aspect of that role, but only two of those years are you actually acting as president.

SB: Gotcha. What do you know about your opponent who's also running for the presidency? And what kind of policies are they planning to implement?

MS: You know, it's funny because they don't give you much space to describe what you want to do. It's a little bit limited the amount of information that you're allowed to put out there about yourself and the policies that you want to implement. It's like a template you get to fill out. So I'm not exactly sure, but he

is, it's a male and he's a glaciologist. There tends to be within the broader field of snow and ice more people that study glaciers than study snow. So we'll see if all the glacier people come out and vote. And if they do, then he might get elected. But I'm sure that he would also do a great job because he's been involved just as I have as sort of a participant in this executive committee, not yet in a leadership role, but both of us have been involved and so I think whoever gets elected will end up doing a great job.

SB: If not elected, do you have future aspirations to apply for another position apart from the presidency?

MS: I would definitely consider applying. The American Geophysical Union, I think that they play a very important role in advocating for earth science. More broadly, they do earth and space science. And so as an organization, they just play a really important role of bringing people together and advocating, like going to Capitol Hill and making sure that earth science stays well funded. And so I think the organization is great. And I think it's something that I would like to be involved in. And so even if I don't win this first election, then looking for other ways that I can contribute to the organization. and volunteer my time, I think is time well spent.

SB: And so how involved are your graduate students and postdocs involved in the AGU? Is that something that you pass along to them that you recommend and encourage them to participate in?

MS: Yeah, exactly. We go as a graduate student in my lab, you present at present your research at AGU every year. And so it's a nice chance to network and meet other colleagues in person and get a chance at sort of presenting and talking about your research. And I think it's a really valuable experience for all of my students every year, there's something to be said about meeting and talking to people in person and learning the way people are doing things either similarly or differently and the new research that's out there. And it's just a really valuable experience, especially as a student.

SB: I see, so kind of like going on to future missions, where do you see yourself in like five, 10, 15 years? I know you still really love Salt Lake City, so maybe same location, different location?

MS: I'm still teaching and researching. You never know exactly what's going to be happening, but I would love to still be teaching and researching, you know, five or 10 years from now I think as you sort of advance in your career you do tend to end up taking on more roles like leadership roles like this one that I'm going for right now with AGU or taking on more administrative positions. You end up being a graduate director, an undergraduate director or department chair. You move into these more administrative roles. It'll be interesting to see what that looks like. Right now, I'm still really invested in growing and building my research program. So that's where a lot of my energy lies and where I'm still, very motivated and excited about. I would be a little bit sad to see some of that go away to take on more of an administrative role but that feeling might shift in the future. And I might be excited to take on more of a leadership or administrative role within the university. But for now, I'm really invested in my research program and keeping it growing.

SB: So about teaching, do you teach every semester or how do you choose the classes that you teach? Is that something that you pose to the department, something that you're really passionate about or is that a need from the department?

MS: I think both, it goes both ways. When I first started, they have classes that they need filled. It's more of like, okay, these are the classes that we need taught. So you'll teach them. And that one, so when you first start, it's a little bit more of them telling you what they think you're going to teach, but as you get further along, you get a little bit more say and sort of interested in teaching this. As long as there's availability and NF faculty members to teach all the classes, you get a little more freedom, or at least that's been my experience, a little more freedom to teach classes as you're really interested in. The classes that I teach are focused around remote sensing and mapping. And the main class that I teach right now is called geospatial field methods. It doesn't have anything to do with snow, but it uses the same methods that we use to map snow. And that's just mapping with drones. And so we get to go out, I get to take students out in the field and they get to fly drones and do mapping projects. With drones it's a popular class. I love teaching it. I hope students like taking it. And so I've really enjoyed teaching that class. I had to teach some other classes first before they let me teach that class that I really wanted to teach.

SB: What sort of systemic biases and challenges do you see now having been a professor among the students that you might have experienced yourself and has there been any change over the years?

MS: Yeah, I think that all women professors probably get not being recognized the same as our male colleagues. And this is usually small things like not being called Dr. Skiles or Professor Skiles but being called Ms. Skiles. And that I try not to let that bother me too much but you just wish that students would just not treat women and men professors differently but It's something that I just try to politely correct or just say at the beginning of the semester, I prefer to be called doctor or professor skiles or just Mackenzie. They'll use either one of those. Just call me by my first name. The comfort level of people being willing to ask for help or like trust that you can provide help has been an interesting aspect of this that I didn't really expect. I will sometimes have a male TA and students will ask the male TA for help before me, they're like, oh, well, I just thought he would be able to help me. And I don't know if that's a perception of like maybe they're asking him because they think that he has more time, but also I wonder if they're asking him because he's a male. So it's hard to like really understand where that's coming from. But I do feel like there's some differences in the way that female professors are treated by students and not all students but enough for it to be obvious to me that male and female professors are treated differently.

SG: When we were talking earlier, you mentioned you didn't want to ruffle feathers because you felt like you forced your way in. Do you think that is just the impression like other people made you feel like you were forced in or do you think it's a little bit of imposter syndrome like, oh, there's nobody else that's female. I just jumped along.

MS: Yeah, I think, I mean, I think imposter syndrome is definitely a part of it. And it's something that I still have. I don't always feel like I belong where I am or that it's kind of hard not to have that as a woman in science, generally. And if a woman in science doesn't have it, then I'm jealous and good for her. I think it's funny because when I say like force my way in, I literally had to say to people you're not inviting women, you're excluding women from field work opportunities. I need to be invited, or saying like field some sort of, you know, group fieldwork event had happened and I hadn't been invited and then I'd have to go up to whoever you know organized and say you only invited men like that's not fair. Even a chance to present at a conference or go to a conference or something, I would have to find my own funding or just ask people to remind them that there are women that also do this work and to make sure that they feel included. And so to me, it very much felt like, I wanted people to be aware of it, but I also didn't want to

be too pushy because I didn't want to be annoying. I shouldn't have felt that way because sometimes you just have to advocate for yourself. But that is where, you know, so it was sort of push and pull between, I want to advocate for myself, but I don't want people to be annoyed with me or think that I'm being pushy. I want to be pushy without being perceived as being pushy. And so that was sort of the struggle that I dealt with.

SG: That answers my next question, too. And then I was just wondering, before I just did a paper kind of about the history of women in field work. I was just wondering if you experienced any harassment or heard stories about any other women

MS: Yes, both. I mean, I think the harassment, God forbid I did not experience any sort of like direct sexual harassment and that I have heard of women who were forced into positions that just sort of never happened. The sort of harassment that I experienced was men saying very inappropriate things and just making me feel really uncomfortable. And one time a colleague of mine, graduate advisor called him and said after I had gone on a field trip, he said it was distracting to have a female on the field trip and I don't think that women should be a part of field work that is mostly male. And I was just shocked. I was shocked that that and my advisor was shocked too that that had been said. And that somehow it was my fault that I like was, you know, as a female distracting the men that were doing field work like it was just gross. I don't know. It was just that kind of experience where, men making sexual jokes and stuff that you just don't feel comfortable with. You don't feel like you belong. It's just totally inappropriate. And that sort of stuff happened all the time. That was my experience, which compared to other women that I have talked to or interacted with that have actually either been assaulted or made to feel like they had to do something they didn't want to do. Luckily, I've never been in that position, but I have felt extremely uncomfortable and that should never be the case for anyone doing field work.

SG: Thank you. Last question, very serious, just because it's an official record. You do work at Monte Atwater Claw. I was just wondering if you had a specific ski line to get, which peak around in the little cottonwood, top of the canyon that you'd like to say is your favorite place to ski?

MS: Yeah, that's a good question. I like Flagstaff a lot. And I think just like anywhere, Mount Superior still scares me a little bit, but I've done it a couple of times and it's been really great. And basically, anywhere. Little Cottonwood Canyon is amazing, but there's so much traffic that these days I end up usually going elsewhere but, I'll call out to Flagstaff as being great.

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SB: What advice would you give to yourself if you were just starting your career?

MS: This is maybe a little cheesy, but to give yourself like time and grace to sort of explore different topics and learn things and that you don't always have to be an expert in everything right off the bat. If you find something interesting to take time and actually spend time learning about it and working on it. And because I think some of the most interesting projects that I've ended up doing have resulted from sort

of meeting someone and thinking finding out like what they're working on is really interesting and then working with them on something and sort of finding a collaboration. And so just like being open to that and then also just you don't have to be an expert in everything. When you're first starting out, especially as a woman, you need to feel like you have to prove yourself. But to just let go of that feeling a little bit because you learn a lot more, you recognize that you don't know everything and you ask questions.

NR: Is there anything that you wish you'd also explore or any other avenues you wish you had time to explore?

MS: Yeah, I think, well, you know, it's funny because you can only, you know, really push for and have time to explore and become an expert in like, you know, sort of one area where I find so many things interesting that I, you know, it's like maybe just by chance that I met my graduate advisor and he studied snow. And so I ended up in snow, like I could have ended up doing something totally different. I just found someone that I worked well with and just loved what they were doing. And I ended up doing that as well. And so I feel like there's any, so many changes along like your sort of lifetime when you just branch out and end up having done something totally different. And so, yeah, I think I imagined like, you know, different like sort of pathways where I could have done something totally different. And I just ended up doing this, but, um, and I like what I'm doing, but like, maybe I could have done something else and it would also would have been great. So yeah, I felt like once I, once I picked my research topic, I really focused on that. And now I get a little more freedom to explore other things. This is interesting. So now I have the freedom to do that a little bit more, but I really think this one thing I thought for a long time. I had to be an expert in

NR: Do you have any advice for anyone that doesn't happen upon finding an advisor right away or struggling to find their passion or something they know they want to be in the field, especially for you know women in the field.

MS: I hear so many stories from people recently out of grad school or in grad school that have faculty advisors and their lives are miserable or alternatively, they have a really bad experience in graduate school and now they don't do science anymore because it just sort of like pushed them out. And so I would say, if you know, if you really, like give it a little bit of time and sometimes relationships take time to establish, but if you're a year into a program and you're like, this is not working for me, don't be afraid to switch. Don't be afraid to find someone that you work better with because right, this is a lot of work and you don't want to like hate every moment that you're there. You want to feel like you're doing something useful with your time. And so my best advice to people is don't be afraid to stop the program if it's not working for them.

SB: So how do you think more women can be encouraged to pursue a career in STEM and particularly in research?

MS: I think there's a couple things. The first one is maybe more systemic and a little bit harder to address and just seeing more women in the field. Because you can picture you can make sure yourself or you see other women that you can look out to or be can mentor you or you can just picture yourself in their shoes.

That's the first kind of hurdle. And if you don't see that, then you say, oh, maybe there this isn't the field to be. Maybe there are women experts for whatever reason. Maybe just women are welcome in this field or and then the other the other thing I think is easier to do now, which is just to be not just not just women who are in the field, but everyone who's in the field to be welcoming and supportive and not ever. I think what my growth through it did really well is just gender never was an issue, never brought it up. It wasn't like, oh, you just want to be this woman or something. It just like was not. It was like totally not a issue. And I think that's how it should be for everyone. Everyone should be treated equal and welcomed. And I mean, everyone comes in with different strengths. It doesn't matter what your gender is. And so it's just like, well, like recognizing everyone's unique strengths and sort of finding what works best for them and independent gender and just making sure it's a welcoming environment for everyone. So it's sort of breaking down barriers and seeing yourself represented in the field, but also then just like feeling a little bit more. You're welcome and even to grow with the field.

NR: Do you think there's anything, in particular, that Utah could do to encourage more involvement from women in the field? Or encouraging women to STEM those degrees?

MS: Yeah, I think, you know, if I am honest, I think Utah has some unique hurdles to deal with based upon sort of religious backgrounds of the student body and maybe assumptions that faculty or graduate advisors might have about women coming into their programs about whether or not they're going to like maintain careers in something or they're going to choose, you know, to be a mom or and that shouldn't ever, I don't think that should ever come into the equation at all. Like if you have a bright student that wants to study something, then that should be treated with a bright student that wants to study something. And so I think, I don't know how to address that here, but I've seen it in action. I've seen people making assumptions about students that they shouldn't be. And so, I mean, I think going back to what I was saying before is if they can just, you know, and it can be as simple as their marketing materials or individual department and how they advertise their programs, show women in STEM roles and make that a regular part of the visualization recruiting techniques. So people aren't afraid to speak up and say, okay, I want to try out and have this research experience and see if it works for me or I'm interested in chemistry. I see other women doing that. I feel comfortable going to that. So I think this like sort of marketing and visualization and all that can have a big role. And so just making sure women are represented in those skills.

SB: What impact do you see in having more female representation and more women in STEM career fields?

MS: Yeah, that is a good question. I mean, I think it just... I think men and women sometimes have different, like, life views, and it's just a diversity of perspectives. Ultimately, it doesn't have to be even, you know, male versus female. It can just be also backgrounds. Like, the more diversity of perspectives you have, the stronger assignments you end up getting. And everyone has their own unique life experience that allows them to think about problems in different ways. And so collaborating with people with sort of a diverse background and a range of life experiences ultimately makes them stronger. And if you have just a bunch of old white guys working on something, then that is not... You're really missing out on opportunities. And so I think it's really just welcoming all perspectives and being open to all perspectives. And that will stream instead.

SB: What is the worst thing about your job? Is there anything you wish you didn't have to do or that you struggle with your job?

MS: Oh, well, yeah, there are some things that I could critique about my job. I think once you are in a faculty role with a research component, your time gets split between teaching and research. And the emphasis, at least at the University of Utah, it's not the same as before, but the emphasis at the University of Utah is on research. But you're also really expected to be an excellent teacher. And so it can be a challenge to balance both of those things. And the saying is kind of like, you can do a lot of things, but do none of them well. You sort of feel pulled in all these different directions. And I always want to be a good teacher, and I want to be a good researcher, but that's a really challenging balance to have. And then also just the administrative works that come along with research. A lot of just paperwork and budgets and spending and not the fun part of science, but it's been a... And that is something I could... If I never had to deal with it again, I would gladly not be able to do it. That's probably the worst part of my job, but it kind of just comes along with managing research funding.

SB: And then opposite of that, what is your favorite thing about your job right now and what about your life? And what do you enjoy most about teaching and researching?

MS: The favorite part of my job is advising students and getting to watch them sort of start a project, sort of formulate ideas and then carry through on the project and then gain skills on how to actually approach something scientifically and sort of start thinking more critically about the world around them. And it doesn't even have to be... They can gain those skills doing something, snow or hydrology related and then take it elsewhere. And so it's, you know, frequently I spend the most time with my grad students, but that can also grow undergrad projects as well. And it's just, I think it's really fun to watch students sort of grow, grow and become more independent thinkers on their own and sort of take ownership of their own ideas or just become more confident in doing research. That's, that's the favorite part of my job. And then I think if I were to think about like more broadly, being in this role, being a faculty person who does research and teaching, like you do end up working a lot, but you have a lot of flexibility in your schedule. And so you can, you know, I can like, take time off to go climbing, or there's no, I don't really have the box, I mean, I'm a department chair, but the only person who's really paying attention to me getting my work done is me. And so it gives me a lot of freedom, or if it's like, well, out of day.

So that is really nice because it ultimately ends up being a lot of work, but you there's a lot of flexibility when that work actually gets done. And I think that's what that's what ultimately keeps me in this job is that flexibility.

NR: And then to kind of pivot more to your research. I know you said one of your favorite projects you've done was the dust on snow research you did in the Wasatch Front. Do you think that's had the most impact as far as helping address climate change or to be able to take action on climate change or is there another project that's been more impactful to advise our politicians on working towards mitigating the effects of climate change and reducing our footprint.

MS: Yeah, that's a good question. I think the dust one someone has had the most immediate impact, because it's something we can see, we watch the dust in a minute, we see it on the snowpack so it's dirtier and everyone can see it and that means that you can see it, it's easier to get people to take action. Whereas climate change is this more like nebulous thing that we only see the effects of. And so, I think more broadly in my work, maybe something that will have a longer term impact is one of the things I study is snow albedo or basically it comes back to us and so that's how bright is the snow and how reflective is it. And so is the greatest natural surface on earth and so the more snow cover we have every winter. The cooler our planet is but as it warms that snow we get less and less snow and ice every year, and that exposes darker. Water or soils whatever is underneath that. And then we absorb our sunlight and it accelerates it feeds back to climate warming and so a lot of the work I do on like sort of the physics and optics of snow and snow albedo and improving the way that snow albedo is represented in the models is probably ultimately going to have a bigger impact on how we model and understand the impacts of climate change doesn't necessarily have a bigger impact on policy, because I feel like there's very little policy on climate change, whereas you know something local like the shrinking grades all like it's very easy to take policy actions on that. And so yeah so there's there's sort of two ways that I see policy is like impacting the hydrology or snow hydrology within the region and that's more immediate, and then sort of longer term, having an impact on climate science, and that might eventually over the long term might end up having a bigger impact but it's a little more. It's not a little more indirect sort of like improving processes and models.

NR: When considering new graduate students that are coming in and that want to work on addressing climate change and do research that helps to avoid accelerating it would you encouraging them to work on bigger picture projects or more localized projects like the Great Salt Lake.

MS: Yeah, that's a good question. I think both maybe both are, are needed and relevant. I think having an impact at the local scale that impacts your community where you live is really relevant. And obviously, you know, some places really need local solutions to local problems. And every community also plays a part in the bigger climate policy as well. So there's a role to be excited about local. But then we also need we also need people willing to take on this sort of grand challenge of bigger sort of federal policy. And even though the political climate is maybe not super supportive of that right now. I mean, if people just it is can be intimidating. But if people give up and don't do it, then we'll never get hurt. And so yeah, so I think it's both if the student was really interested in working on sort of the climate or like more like sort of regional to global scale and having an impact on policy at those scales, I would do everything I could to support them.

NR: Did you ever or do you still feel any imposter syndrome? And if so how did you overcome it? What advice would you give to a student that feels like they are an imposter?

MS: Yeah, I mean, I think I, I don't know that you ever grow out of imposter syndrome. I mean, maybe, uh, I mean, maybe some people do, or maybe you know, some people never feel in numbers plates. I don't know. I have, oh, I've always felt it. Um, and I mean, I think it, maybe it fades a little bit over time as you just get a little bit more established or older and it's still there, but you know, you're so busy, we're hearing your projects that you don't think about it as much. Um, and then it comes kind of roaring back every time you go to a conference and you see what everyone is working on. And they're like, Oh, what am I, what

am I doing here? Why do I long here? Everyone's doing so, so much cool stuff. Like, um, and I think the advice that I give to myself and to students is, um, you know, and it comes back to the sort of diversity of using ideas. Like you could be working on a similar problem as someone else and you're coming at it with a different viewpoint and different ideas and to, you know, all the better for different people to be working on the same problem because there could be multiple solutions or fixes to that problem. And so try to say, like, don't, you know, in a way it will always be like competition in, in academia and research, but to not view it as competition, but as even like it's that similar research is supporting other research because that's the whole point of science is that you want to reach your consensus on something. And so you want, there are people working on the same topic because you ultimately want to reach consensus and a part of that is being able to recognize that when maybe you were doing something wrong, you were sort of have this like a correct hypothesis about something and that can be challenging, but you have to be able to recognize it because we're all sort of working towards the same goal of better understanding her system a little bit better. Um, but ultimately I think I also tried to tell people that, you know, listening to other people talk about their research is, it's just like social media, they're going to present the best side of that and they're not going to tell you about all the problems that they had or all the issues that they ran into. And so it's going to seem like this perfect polished product and you're going to panic and be like, I'm having such a hard time with this. Like, how is it so easy for them? And they're, and that's just like, I'm like, think about the way you presented your research. You don't spend the first 10 minutes talking about all the issues that you had. It's sort of a polished product. And so I just encourage students to think about what was the end to that polished product and not to compare themselves to others. So it's easy advice to give, but it's not always a good advice to actually like dig and implement, but I just always try to keep that in mind. Um, even though it's, yeah, it can be really hard to watch your colleagues present full research and be like, ah, there's so much farther ahead.

NR: Kind of going off that, what's been your experience like presenting at conferences? Was that first experience just terrifying or did you feel at ease the whole time?

MS: No, the first experience was terrifying. I think I still can remember like my voice kind of like, making this weird, like, wavy, because I like couldn't really, I don't know, I'm so nervous. And then thinking about it, while I was presenting, I was like, Why don't we sound so weird? And then like, that's like a feedback in your head. And I practiced a lot. And then for each talk after that, I practiced a lot, until I just got a little bit more comfortable. And now when I get talked, I like, babe, I don't, I don't want to practice. It's just, I've done it so many times, but it's the same day where it's like, some people are more comfortable talking in front of others, and other people are and it is a critical part, going to conferences and presenting your research is a critical part of what we do. So, so whether or not it's like, it's practice or like talking to yourself in the mirror or whatever. It's kind of something you have to find a way to get to, to be comfortable with and, and sometimes that just means going through some uncomfortable experiences where you're a little nervous.

NR: Then kind of shifting topics a little bit, did you ever notice like a shift in gender representation throughout the field, like throughout your career, and did you ever notice like a disparity in funding and how things were allocated and you saw like, all your colleagues getting funding when you and another woman worked, or is that not as much?

MS: Yeah, I'll address the first question first. I think just now, so I've been doing this, I started graduate school in 2009. And I think just now, we're sort of reaching a point where I can look around and see more, and their graduate students are early career, but I can look around and there's many more women involved in science than there were when I started. And that's great. I mean, I, and I would say that that's within the last sort of few years where that, I've noticed that change. So it's taken time to get to that point. And it's not like women are evenly represented by any means, but I think generally within the science, or within geosciences, I think the statistics are is that it's typically about 70% men, 30% women. And within my area of geosciences, I think it was maybe 90% men and 10% women. And now we're sort of working our way. So it's not evenly, then women are at least working around generally to be more sort of in line with the rest of the geosciences, which is a good first step. You don't need to kind of start somewhere. And then in terms of funding, I think this, that is still a problem. I think that, I think men in this, in my field in particular, just have to do less and they get more. So women are just held to a higher standard. And we just, I just feel like I have to work way more and publish way more, do way more to even get a recommend as like the same level as my male colleagues. So that's really frustrating and that's something I don't know how to fix. I mean, if you go directly to a program manager who's handing out money for funding, can you say that to them? They get offended and they say, I'm doing my best to give funding to the people who are doing the best science, even though, I guess so, you know, because like, I think it's sort of an underlying bias and people don't like those biases necessarily getting pinned on them. So it's a delicate issue that I don't know how to fix. And the last couple of days, it's funny, the last couple of days there was this online meeting for snow hydrology and it was like 200 people were all over the country attending, so a lot of people. And they were having experts in the field present on sort of the cutting edge technology and all of them were men. All like, there were 24 speaking clubs and there were four women like in the agenda, but none of them were like the field experts. And I was just like, this is the perfect example. Because if you don't put women on the agenda as an expert, no one's going to go to them later and ask them about those topics. And so that was, I mean, so I'd love to say that it's like not an issue anymore, but it definitely, it's.

NR: Would you say that you put out all these papers, all this research, do you feel that it is, you know, been appropriately recognized and appreciated now, or do you still feel like, you know, a male probably could put out that same amount of work, would they be, like, better regarded?

MS: They would probably be cited more and that's the currency of like what we do is how often, you know, people cite your research and I think I don't want to say that because I have done You know, I have done research that's been well received and well cited So I don't want to say that go I never get cited But what I will say is often what happens is that someone will say a paper by my graduate advisor Rather than signing a paper by me, even though mine is the more appropriate reference So they'd be like similar topic areas, but instead of citing mine, which is more recent They'll cite an older paper where he was the main author and it's not it has like nothing to do with him If anyone asked and they feel like he'd be like I should cite that with a more recent paper Then I think it's just like it's again. It's like sort of this Guidance in people's heads where they men are the experts and so they're gonna say And then it's a it's a self-feeding cycle because then oh that he was more cited. I'm gonna say more cited sleeper And so and I think other women in my field would say the same thing That it's not that we never get cited, but it's not our male colleagues do.

SB: It's also a response. My roommate, Sophie, has a PhD program in research. She attests to a lot of what you're saying. Yeah, I know it's funny, because I know I'm not the only one. But it's always nice to hear other people's experiences and to know you're not the only one. Yeah. Yeah, that's awesome.

NR: So I guess kind of related to women not being as like well-represented and cited, and that could be discouraging. You know, do you think more role models in the field would help women feel more validated in what they're doing? Do you think people and, you know, women see you as a role model or do you have any specific ones in the field?

MS: Yeah, I do. I do have, I mean, they're, I had to kind of seek people out because within my, when I was in graduate school, my sort of immediate collaborators or colleagues of my graduate advisor, there weren't any females in that. So when I started going to conferences or interacting with other sort of network of other colleagues, I sort of sort of seek people out specifically. And that has been super helpful to have women in the field. And sometimes it's just to like watch what they're doing and sort of, you know, how frequently they're publishing and how many graduate students they have, or just be able to send a quick email and be like, What do you think about this? It's like really helpful to have those people. And it's not, I don't even collaborate directly scientifically with some of them. And they're more just like a friend and a resource.

And then I think this is maybe not exactly going to answer your question, but I think it's something that can help in terms of like see having more women in like leadership roles or representation as I mentioned program managers and one of the intimidating things about being a woman in science is that and I think this is changing but very frequently the people that sort of control the money and hand out research funding are men.

And it can be intimidating as a woman to approach that person and like describe your research ideas. And often that is how, you know, having relationships with program managers is really helpful. And it can be, at least when I was starting out, it kind of felt like a voice club, like the men of my field were funded and the program managers were males and they could like hang out with each other at conferences. And it's like really hard to break into that, like sort of like voice clubs, you know, circle and, you know, some of that might've been my own insecurity or posture syndrome, but also it's just like an intimidating dynamic. And so figuring out ways to break up that dynamic and making people who are actually funding the research more available and less intimidating, I think it's well played a huge role in just women, not only like getting established in STEM fields in the first place, but then also just staying in it through their careers.

NR: That makes sense. I guess also like going off of that, did you hear back about the election for the AEG?

MS: I did. I got it.

NR: Congratulations.

MS: Yeah. Thank you. That was great. Yeah. So that felt nice.

NR: And I remember reading you said there's like a year now that you'll spend working with the current president, will you be able to implement your ideas right away, or is it kind of like slower passing the torch and that next year you'll have more freedom to do what you'd like to do?

MS: Yeah, it's a slow passing of the torch. So I'll work with the current president. And it's funny, speaking about like, you know, seeing women represented in the field as the current president, it's a woman. And she is the one that I've worked with in the past. And seeing her in that role made me comfortable putting myself up for that role. So it's sort of a direct example of this. And so it's exciting to have this time where I kind of get to learn from her and, you know, understand the expectations of the role, but also understand sort of what actions I'm able to take. And then she also stays on. When I think about that role, she stays on for another year in sort of an advisory role. So you get lots of time to like learn and then be supportive when you move into that position to sort of be like, cool. Yeah.

NR: Yeah, more about like, I guess kind of the Valley here and kind of from the research you've done and everything you've read and seen, what would you say is probably the biggest contributing factor to the depletion of the Great Salt Lake.

MS: Yeah. The Great Salt Lake Water System is really unique and it's not the only, you know, system like this in the world, but what makes the Great Salt Lake System so unique is that it's so small. It's like really enclosed in almost all of the water to sort of refill the Great Salt Lake. It comes from snow. And as the number of people have increased between where the snow melt went off and where the Great Salt Lake is, less and less water has flowed off into the lake over time because the people are using it. And that's part of the reason why we all don't live here is the sort of ready availability of surface water every year and the fact that that's able to support agriculture. And I think actually that even though the Great Salt Lake has been shrinking, there's enough water to meet everyone's needs. There's enough water to meet people's needs. There's enough water to meet agricultural needs and there's enough water to let it actually run off and sort of re-scape wise lake levels. But the problem is that we're not very efficient at managing water right now. Moving it around in an efficient way actually recording how much there is, knowing exactly how much snow there is in the mountains. There's just like the easiest way to explain it is that it's like a leaky system. There's just not great and efficient water management. And so I think the main problem now is actually sort of addressing water use and how we track water and then better just like there's no tools to know exactly how much water we have in the mountains and that can include modeling or flying planes over to measure it. And very little work has actually been done on that side even though the snow is the natural water reservoir and that's where all the water comes from. A lot of times they're trying to address symptoms of the Great Salt Lake, like increased evaporation or sort of these midstream water uses. But I think if we started at the source, got a good understanding of how much water we're starting with every year, then we can navigate it efficiently. And that's not how they've been thinking about addressing that problem despite me speaking up as loudly as possible. So I think they might get there eventually because if you don't know how much water you're starting with you don't know how to use that water efficiently.

NR: How would you gather that data? All the resorts and stuff track snow totals throughout the year, and all that data is recorded, and there's plenty of gauges along all the tributaries that lead into the Jordan. So what other methods do you use to more accurately track that? Yeah.

MS: So a lot of the measurement sites that we have, whether for the Red Sea resorts or there are snow soils, these automated snow telemetry sites, all of those are located, or almost all of them, the measures that are located in the mid elevations. Once the snow melts above that elevation, we're blind to how much water is actually left up in the mountains. And you can look up, you know, in late spring or early summer, and still see that there's a lot of snow left over the mountains, but we don't actually know how much is there because it's melted out above the measurement stations. but there are even why LIDAR, you can map the snow depth over an entire watershed rather than measuring it at like a single point. And that is expensive, but all you need to do is sort of a couple of flights to understand snow distributions. And then you can use that information to inform or space the distributed snow models. And it will, you know, simulate snow buildup and melt out over the entire watershed every year informed by those snow patterns. And a lot of people have shown that that is the most accurate way to know exactly which water you're starting with and that knowing that can make water least decisions downstream of the watershed. Okay.

NR: And then I guess on an individual level, you know, what is something that we could do to help keep the grade from drying up and, you know, are there ways that as an individual, besides voting, that you can, you know, help to alleviate this kind of leaky water system.

MS: Actually, I think I never knew that other people expected this and I don't think there's much that that individuals can do because it is actually kind of a hard problem because 80% of the water is going to add a future. A very small fraction gets used for our personal water consumption. It's tiny even even lawns. Showers. I mean, of course, water conservation is never a bad idea, but it doesn't make a huge impact in terms of numbers for the Great Salt Lake and we have sort of a bigger systematic Change that would be needed in the way that our country approaches agriculture, like a big change and you know there's no you don't ever, you know, farmers are just trying to make a living. So it's not farmer's fault. It's the way that the our country has sort of made this agricultural economy around different crops that really shouldn't be grown where they're grown. And so it's a challenging problem. But ultimately, I mean, people have to do water conservation because it's just generally good idea, but You know, ultimately, we want to address certain water issues here and in the broader West. There's bigger systematic problems that probably need to get addressed and then most of those were released back.

NR: And I guess, I know you're going to have a lot more responsibilities with this new role you're going to take on, but where do you kind of see your future research going to go into kind of more accurate modeling of the Wasatch or something else? What are you really excited to start next, besides the new Wasatch?

MS: Yeah, I mean, I think a lot of my labs work, so a lot of my students work right now is focused on more accurate modeling and proving the way that we can run those models and also where the data comes from for those models. And so we're really trying to come up with innovative ways to use remote sensing data from satellites. And then also to integrate like the IR plane mapping that I mentioned, and also use

the long term measurements from the observation networks on the ground. So how do we integrate all of these sort of multi scale measurements to come up with the best models that we can of our watersheds and really focusing on the time period between when we hit peak, so what are the peaks of depth and melt out because that's the most critical time for water resource decision making and so being able to provide accurate snow melt volumes and timing to people downstream to sort of, you know, we're not making decisions but if we can give them better information, maybe they can make better form decisions and use water.

SG: So I just had a one follow-up question from last time, too, could you talk about how you have to stand up for something and on trips and you get your work recognized. Is there anything which I think is pretty impressive to graduate students to stand up, but is there anything like that you wish you stood up to people more or what other things, you know, like a battle?

MS: Yeah, you know, I think I did, I sort of selectively picked my battles, and at this point, in my career, when I'm a little more established and less afraid of people, I, I'm, I'm more willing to speak up and say something like this conference I mentioned, but only if I haven't been the speaker, that's the experts. I emailed the person who had organized that meeting, told me that I thought I made a mistake by only helping men. And then I gave him examples of women that he could think I could just speak about those same topics. And, you know, I think in the past, I would have been worried like, oh, this person is gonna think that I'm like, for saying this, but if nobody ever said anything, then nothing's ever going to change. And so I, I, I wish that if I hadn't spoken up more, but in a way, I also think that not speaking up sometimes did allow me to potentially have experience that I wouldn't have if I always spoke up and always criticize people for not sweating women, like be involved, you know, so it was sort of like playing the game a little bit, being a part of the culture and getting those chances those experiences like trying to be cool. I don't know. So, like I feel like, you know, not speaking up about me get some experiences and get more established. But now that I'm in Miami established I'm less afraid to say those things. Because now if I don't get a field experience, because someone didn't invite me to go, oh, Jesus, I always thought I was going to go get opportunities in the field, then I can just go on and organize and play my own game and make sure that people, you know, that everyone's represented and welcome and invited. And so I, when you don't have those resources they can feel really risky to kind of step out your company's own and say something. So there's many times when they didn't, just because I didn't want them risk. I guess maybe I hate that I think about this way now that he being like I didn't want to be annoying. And, and so I wish that I've been able to speak up at the same time I have spoken up I've gotten all the experiences.

SG: Looking back at a lot of male groups and obviously nobody ever back when I thought, do you think there would be like when you like to make it all in this group and do you think that would have a positive impact or something?

MS: Yeah, I was, I was looking at something I have thought about in the past. And it's something that I think needs, you need to have someone who's the champion and you're like, we'll really put in the time to making sure people feel welcome and supported and like someone to work in like meetings to make sure it's like, well, we're gonna because the worst thing is that you have an idea that you don't really have the time to follow through. And so I could foresee, like, really having the time and energy for something like

that. Maybe a few years down the road, which is, which is like, maybe I should just do it now. But yeah, I mean, I don't know one that exists in my field. And I, and I would do a great job.

SG: We watched a movie in class a few weeks ago called Picture of Scientists, but one of the people in it is Kevin, and she mentions how long her time is spent, like, as a black woman feeling she has spent a lot of time crafting and curating her emails and responses so that she's perceived in the light she needs to be perceived in. Have you had any similar experiences?

MS: Yes. You don't want to use too many exclamation points, you don't want to use the wrong, you don't want to be too colloquial, or like, too, you know, it's just like, you got your tongue on the moon, it's all like, it's, it's, it's just like really important and it's funny because now I have a female postdoc, and she's just getting established in the field and she says that she has like chat GPT review her emails to make sure that they sound professional before she sends them out. And I was like, Oh, maybe that was the same time rather than just me staring at them. So, yeah, that's, that's definitely something you guys still have always done that nice deal with.

SG: And then I guess, if you want to talk a little bit about your work with TIGER, but you're just specifically well around automation for the lab.

MS: Yeah, and it's, yeah, I feel like it's particularly fun on the last couple of days. Yeah, so they, yeah, they're just, I don't know. Yeah, an environmental non-profit group started by us and we just did not see, he was worried about climate, he just didn't see anyone else doing anything else to be sort of this advocate for not just protecting our record, like that's a nice pitch, but just more broadly protecting the environment. And the, you know, I really like the mission that they come up with is that, you know, it's not just, it's not, it's not partisan, it's, so many people enjoy the outdoors for so many different regions, let's bring together everybody who enjoys, they call it the outdoor state, bring together everyone who enjoys the outdoors, you know, come up with ways that we can protect the places that we love, and their main sort of way that they advertise is through advocates who are influencers, and I think it's effective because one time they put up this slide that showed the reach of all the influencers, and it was like, you know, these people or something, and then they use scientists, the science lines, to make sure that their, their sort of pathways and influencers are formed and same very things, and that they also put up like the reach of all the scientists, and it was like, you know, we shot like 500 people, so we don't have the same reach, but we can provide and support those people that do have huge audience, make sure they're informed, they know, you know, they're not climate experts, but they want to make sure that they're saying and learning things, and that if they sort of put themselves out there, that they know that they have sort of this team of scientists that can help support them, and that is part of our goal of protecting our influencers, is just, you know, to support them, and then also we get to go to Washington, D.C., and advocate for different policies, and so I've been to D.C. with them, and then my role is, is we have to basically be there as the scientists that can talk about, everyone else can kind of get their experience, and then say, well, the scientists don't really support, and sort of, like, just, it's easy, I think, for the athletes to not be tabled seriously, because someone will say, oh, you're not a scientist, but then they say, oh, well, but I have a scientist right here, and so that's kind of my role with power, and I think, I think in this day and age, where social media is so important, that they have a way to impact based upon, like, the way that they go about advertising and reaching people.

NR: Are there any other groups that you work with or would like to work with that also have a bigger reach or more influence.

MS: I work with a much smaller group, and it's a different focus, but it's called Community Snow Observations. That's kind of really specific to my field, but it's for backcountry skiers that if you're out already and you haven't had lunch or broke with you, you can just pull it out. And on your phone, I don't know how to record snow depths. As you go along, there are different spots, and depending on how much sun you have and how much excitement you have for it. And that automatically populates on a map with a time stamp. And in areas where there's a lot of observation, it just allows us to understand some distributions a little bit better. So that's kind of a cool sort of citizen science effort that I'm a part of that I try to tell people about. And yeah, but there is, there's really, I mean, I think out of, you know, to fill the need for this, there's a lot of really great environmental nonprofit work going on. And everyone kind of has their own focus, but all sort of focus on protecting the environment and all of that work is important and worthy and hopefully people don't get. Um, we have to negative about it and it's sort of changed a little bit because we're still needs to get done even if it's a little bit harder.

NR: Have you ever considered working with the ski clubs on campus with that citizen science project and encouraged their members to take those readings.

MS: Yeah, that's a great idea. I have not done that yet. But there's a great idea. We did last year, oh my gosh, maybe two years ago now, we didn't work with Seacub. So Kieran Jones, the head of the director of the game to University of Utah, we did a showing of one of his films about like reaching across the local divide, and then did like a panel afterwards and we never tested once too close. Yeah. So yeah, that was great. But yeah, I, I, it helps in your, you know, I don't know, actually, this might be like my perception, but I don't know how many backcountry skiers are part of e-clothes, because it helps to have an apple and sprout with you. And so maybe I just assumed it was, you know, not seeing it right. It probably wasn't.

SG: I do have one, I guess, as the obviously kind of goal that this whole thing is like, giving, you know, showing history like a view and just making sure that we are getting women's stories down for the records that we overlooked. Do you think there are questions? Is there anything that you kind of wish you brought up that you could highlight and that we could bring or just do or anything you want?

MS: Yes, thank you. After we talked about saying I did think of something, but now I'm gone. Or it's like something I wish I didn't.

NR: And if it comes back to you at any point too, we can hop on a quick call and just.

MS: because it was like, oh, I wish I had told this story or something. I can't now I know I can't remember. No, I don't think so. I mean, I guess just I love that you guys are doing this. I think it's a great project. And I think that ultimately, like if I were to summon my experience, it would be generally very positive. So I feel like I've been able to make change and to support the women in the field, but that there's still a lot of work to do. And that there's been hurdles, so there's still unique hurdles to women in

science. And it would be great to sort of like which a point where those didn't exist. I don't think they're not going to be a thing.

But oh, yeah, I actually did want I remember now one of the things that I wanted to say is I think that the sort of the way that you're forced to be in as a woman in science you're it's like you you get a little bit defensive of like you're like oh because you don't get recognized as much as you want you sort of like try to advocate for yourself and talk about your work and and I think that that kind of can hit women against each other sometimes so where they're super competitive and even more competitive than they might be with their male colleagues and I think that that is just the most unfortunate type of act of feeling like you don't belong because you're sort of like proving to yourself that you belong but in that you can become really competitive and you know feel like you're trying to prove yourself or like trying to force out a little women I have those interactions with women and I feel great feel like they're competing with me rather than supporting each other and I and it makes me sad and so I hope that you know like the benefit of just like feeling comfortable and equal with everyone is I think that would go away um and I it's yeah so I think that that's an unfortunate side effect of sort of this like feeling like it's very competitive um where actually women they support each other can be much sort of have this community support and um yeah just overall better experience so I remember wanting to like how it's like you either meet someone in science another woman in science and you become best friends forever or you meet a woman in science and you're like why does she do this so I'm like there's not a lot of implications um and that I feel like it's just a product of how we're forced to like exist in science and that is unfortunate.

NR: Do you feel like that's changed at all throughout your career? Like hopefully more of the former is what's happening now?

MS: I do think, I actually have most of those interactions where I feel like I want to be really competitive or they're not supportive, is almost always now women who are more established than I am, and women who are coming up into the field now, I feel like we have a much better community and just kinder to each other and supportive, we see each other, conferences, we hang out. I mean, that is the kind of thing we want. We want to feel supported and well, other than just like your science friends, like that's much more fun. And so I do think it's changed. I think it's a change and I hope that it continues to change.