- When I think back to how I was as a little kid, it feels very obvious that I'm working in science now because I was kind of a little rugrat child running around outside and was always just incredibly curious about the natural world and all of the different like plants and animals and how different things just exist and operate in the world. Very outdoorsy child. And then I think as I kind of went through school and high school, science and math classes were always just like the best and the most interesting to me. And so I was kind of just following the experience of the things that I liked doing more so than this is a career goal that I have for myself.

- [Narrator] You're listening to Further Together: The ORAU podcast. Join Michael Holtz and his guests for conversations about all things ORAU. They'll talk about ORAU storied history, our impact on an ever-changing world, our innovative, scientific and technical solutions for our customers and our commitment to the communities where we do business. Welcome to Further Together the ORAU Podcast.

- Welcome to Further Together the ORAU Podcast. As ever, I'm your host, Michael Holtz from the Communications and Marketing Department at ORAU, and I am in the middle of a series of conversations with NASA Postdoctoral Program fellows who are gathered as we record this. They're gathered for a virtual symposium, and I get the pleasure of talking to a number of them while they're having this event. And one of those fine folks is Zoe Pierrat. And Zoe, I just first of all wanna say welcome to Further Together.

- Thank you so much. It's a pleasure to be here.

- So Zoe, tell me a little bit about your fellowship to the extent that you can talk about it and how you got to where you're.

- Yeah, so I just started my fellowship this past July at the Jet Propulsion Lab in Pasadena. And before that, I was at the University of California, Los Angeles and I'm also from Los Angeles. So it was really important to me to stay in the area for grad school and for kind of whatever happened next. So I'm incredibly, incredibly fortunate to have incredible career opportunities as well as family, all in the same location. I think that's pretty rare with academics. And I'm studying the spatiotemporal dynamics of water use efficiency. So how much carbon plants take outta the atmosphere and how much water is lost.

- Okay, so that sounds like a pretty critical issue when you're talking about things like climate change and net carbon zero and all of those sorts of things. So does that relate to to climate change issues?

- Yeah, absolutely. So terrestrial carbon cycle feedbacks are one of the largest sources of uncertainty when we project what our climate is gonna look like into the future.

- Okay.

- And we actually don't know if plants are going to be a source or a sink of carbon in the year 2100. And so understanding how plants are using water resources and how they're responding to changes in climate and the resulting feedbacks on the climate system is incredibly, incredibly important. And it's also a very challenging problem to tackle because it's a living system. So other aspects of the climate system, there's usually good like mathematical models that we can use to represent specific processes, but plants adapt. So it's a lot more uncertain and that is what a main source of uncertainty is.

- Gotcha, so it sounds like really critical and important research as we head or continue in a world being impacted by climate change.

- Yeah, definitely. And it's really motivating. It's a very motivating problem to work on.

- So I can imagine.

- Yeah.

- Zoe, was science always something that you've been interested in? Whether it's particularly related to climate change or science in general, has that always sort of been an interest for you?

- Yeah, so kind of yes and kind of no.

- Okay.

- I think when I think back to how I was as a little kid, it feels very obvious that I'm working in science now because I was kind of a little rugrat child running around outside and was always just incredibly curious about the natural world and all of the different like plants and animals and how different things just exist and operate in the world. Very outdoorsy child. And then I think as I kind of went through school and high school, science and math classes were always just like the best and most interesting to me. And so I was just following the experience of the things that I liked doing more so than this is a career goal that I have for myself because I'm like the first person in my family with a PhD, neither of my parents were scientists. It wasn't really a career path that I knew anything about. It just was me following the things that I was interested in and passionate about. And one thing led to another. Yeah.

- And here you're.

- Here I am.

- I love it.

- Yeah.

- Love it. So I know you're still relatively new in your fellowship, but how has being a NASA postdoctoral fellow impacted your career so far?

- Oh my gosh, it's been the best thing for my career. I'm incredibly, incredibly fortunate to have gotten the NPP. I think when I was getting close to graduating with my PhD, I definitely wanted to stay in the research world. So I was pretty much just looking at different postdoctoral opportunities and had a couple of options at different institutions. But for the work that I was kind of the most interested in doing, which is this water use efficiency stuff, there wasn't the kind of data access and collaborative opportunities for the work that I was wanting to do anywhere but the Jet Propulsion Lab, it was like, if this is the work that you wanna be doing, then this is the location that you need to be for that. And I am super grateful to have had my proposal selected for this work. I think it's been really fantastic. The people at JPL have been incredibly, incredibly welcoming and supportive so far. And I feel like being outside of the academic setting and at JPL, I've had kind of the resources and immediate ability to contact people that are really on the front edge of developing these massive satellite products. And that's been

- Awesome. a really incredible experience.

- Right, I've never asked, I don't think I've ever asked anyone from the NPP of this question, but how rigorous, how complicated is it to apply to be an NPP fellow?

- That's a great question. So there are a couple of kind of avenues to apply with the Jet Propulsion Lab. You can kind of go on the NPP site and look at listings of different scientists at JPL or other centers that have put these are the general themes that I work on and we can write a proposal. And I think that that process tends to be fairly straightforward. I think there's really clear guidelines on the NPP website on what is expected in the proposal and what people are looking for. I was very interested in working with a specific individual who didn't have a listing. And so I actually had reached out to my advisor in advance and been like, "Hey, I really wanna work with you. What are the options here?" And so we kind of came up with a listing together that would suit the needs of what my proposal was gonna be about, which was kind of a great experience.

- That's kind of cool. So you just sort of took the initiative on your own to say, I really wanna work with you.

- Yeah.

- How do we make that happen?

- Yeah, definitely. And because I wanted to stay in Los Angeles too, so it was very much like, this is how do I make this happen?

- A little bit of self-motivation.

- Yes.

- Right? Definitely.

- I love it. So I assume you would consider this individual a mentor, talk about the value and the importance of mentorship to you as a scientist.

- Oh yeah, mentorship is incredibly, incredibly important. I am super fortunate too to have had my PhD mentor was kind of more senior career individual. And I think that going through my PhD that was super useful because he's had decades of experience mentoring students and that was a really good stepping stone for me. And then now my mentor at JPL, I'm actually her first postdoc and so she's very early career. And so it's been this really fun adventure where we're kind of figuring it out together, which I think has been great in a postdoctoral position too, where you don't need quite as much like handholding. She's also been through a lot of these experiences more recently 'cause her kind of career stage is not that much farther along than mine. And so she has a more kind of recent experience going through all of these different things of like, okay, here's how to build your career at NASA. And yeah, that's been super useful.

- Awesome. On the flip side of that, have you had the opportunity to mentor other folks yourself?

- Yeah, so not yet at JPL. During my PhD, I helped mentor a couple of different undergraduates. I actually did field work in Florida with some undergraduates from Boden College, which is a primarily undergraduate institution in Maine. And that was a really rewarding experience too, because I myself went to a primarily undergraduate institution. And so it was cool to be able to see the mentoring that I'm giving these students felt very reflective of kind of the mentorship that I got when I was at that particular stage. And especially at a primarily undergraduate institution, you don't necessarily know what the opportunities are for research. And so you rely so much more on those kind of external mentorship opportunities. So we worked on collecting pigment data to again, understand photosynthesis in pine forests. Yeah, I love mentoring. I think it's really a good time.

- Awesome, awesome. Zoe, if you would talk about any obstacles that you've had to overcome to get to where you're today?

- Oh my gosh, great question. I think that one of the biggest obstacles is just kind of the general feeling of academia and research being like this big black box.

- Okay.

- And like not having kind of anyone in my family that's gone down this experience, I have really relied on mentors throughout my career to help show me like, okay, these are kind of the unwritten rules of academia and research that aren't necessarily written down for you anywhere. So I think that's definitely been a learning experience. Let's see.

- I'm wondering, have there been any obstacles? I mean, there aren't a ton of women in science, so you're a woman, right? Working in science. Has that been a challenge?

- For sure. Yeah, I mean, I was a physics major during my undergraduate, and there were only two women in my graduating class.

- Wow, okay.

- And I also started graduate school at UCLA in a department where I think there were, at the time less than 10 women in a department of, I think over 50 graduate students.

- Wow.

- And so it's definitely one of those experiences where you, like, it's apparent, it's always apparent to me when I walk into a scientific setting and I'm one of a handful of women in the room.

- Right, right.

- I've definitely also had the experience where I've walked into situations and I can tell that someone that I'm speaking with is kind of underestimating me and underestimating kind of my abilities and my sense of being there. And that has also been, I would say, a continuous challenge in science, especially also because I'm fairly young. I'm not yet 30, and I have my PhD and I started this program. So I think the combination of those things is definitely a barrier. I think I have also been able to find some really incredible community because of that. In my undergraduate, I helped organize a Women in STEM group and also in graduate school I helped organize a Society for Women in Underrepresented Genders in Geosciences. And I made some really close knit and really strong bonds with people involved in those different organizations. And so I think that even though it's been a thing where there for sure have been barriers, and I've like faced discrimination because of it, I've also found these really amazing communities. And I do also wanna acknowledge that like as a white woman, it's a completely different experience than what we know to be the case for women of color, which have similar experience, but amplified times a billion.

- Right, absolutely. I've said this before many times, like representation matters, right? So if you're not seeing yourself in other scientists, it's hard to see yourself in that place. Zoe, what do you say or what do you do when you talked about you can tell when people are sort of underestimating you, what do you do in those situations?

- Yeah, so I think part of science, I mean, regardless of who you are, nobody really wants to talk about this. But a lot of science is kind of networking and building your network of scientists and collaboration. And so I think that when I am faced with someone that I can tell is potentially writing me off, I like to, I think one, decide I'm gonna just prove them wrong and put out the best science that I know that I can and the best presentations and et cetera. And I know that my work speaks for itself and the accomplishments that I've had over my scientific experience speak for themself. So I can always lean on that. And then two, I think that if somebody is paying me no mind, then I'm gonna pay them no mind back, because there are definitely people who are gonna be out there and are going to champion for you. And so it's very useful to find and identify those people and know who they are.

- Right, and as you said, you're building your network and your collaboration, so you find the people that you believe in and who believe in you as part of that process, right?

- Yeah, exactly.

- So talk about the importance of collaboration because I know science, it's not a solo sport, right? It's very collaborative. You work together with other scientists who maybe aren't researching or working on the same thing you are, but you're working together to learn and figure out, solve problems and that sort of thing. So how does that work in the world that you're in?

- Yeah, I love that. So science is definitely, definitely a team sport. I mean, I would be absolutely nowhere without my collaborators. I think that one of the best things about collaboration is that you don't have to know everything. That's kind of the whole point. It's just one of those things that's been proven time and time again that the collective and collective knowledge is always gonna be more and better than an individual. And so I've definitely experienced that in my scientific journey. I mean, my first paper in my PhD came about because I was out in the field and I ran into another grad student also out in the field, and we were doing completely different research. I'm doing like remote sensing and she was studying STEM diameters of trees and very heavy into the kind of plant physiology. But meeting and then talking about the work that we do, it was very obvious that while we're taking completely different approaches to the work, we can answer very similar questions. And if we do it from these two different angles and different viewpoints, we can get an answer that's so much better and so much more robust than what either of us would've been able to come up with alone.

- I love that.

- Yeah .

- That's a great example of just being in the right place at the right time to meet another scientist who now you're working together and helping each other figure some things out and solve problems and learn. I love that.

- Oh, absolutely. Yeah, I mean, the first time that I was like, I want to be a scientist was the first time that I went to the American Geophysical Union Conference, and it was really the experience of being around so many other scientists doing so much interesting work and just talking to people and hearing what they were working on. And I just find it so inspiring, like how passionate scientists can be about the individual niche that they're working on, and yeah, collaboration just comes up. You just come up with such better ideas than what you can on your own. I think I do it.

- No, that makes perfect sense. Water rises all boats, and if you're in it together, then you're getting somewhere together. So what advice would you give again, to an up and coming scientist, someone who's looking at Zoe Pierrat and saying, "I wanna follow in her footsteps." What do you say?

- I would say follow the things that you're the most passionate about, and to not lose sight of your own happiness. Think that happy scientists produce good science because you're not fighting burnout. And at the end of the day, that's kind of what we're here for, is to create the life that we wanna create. And if you're working on a topic that you feel motivated by and inspired by, and you surround yourself with people that make you feel good about the work that you're doing and supported in that work, then you're gonna put out the best science that you possibly can. So find your allies and figure out what you feel the most passionate about and the most motivated by, and take it from there.

- Awesome, I love that answer. Last question, Zoe, what brings you joy?

- Oh gosh, so many things bring me joy. I have a fabulous, fabulous cat. She is the love of my life. She brings me a lot of joy. She brings me a lot of peace, a lot of quiet to my brain that can feel like scrambled eggs sometimes. I also get a lot of joy from being outside and in the sun. I'm really into cycling as well as running and swimming and kind of triathlons.

- Nice.

- Anything that I'm running around outside. And then my friends bring me a lot of joy. I have an incredible community of people in Los Angeles that I've surrounded myself with, and I'm incredibly, incredibly thankful to have them supporting me and cheering me on through whatever I'm doing.

- Awesome, I love that answer as well. Zoe Pierrat, thank you so much for spending this time with me and telling me a little bit more about who you're and your NASA postdoctoral program experience. I really, really have enjoyed this time.

- Yeah, thank you so much for having me. I've enjoyed it too.

- Absolutely, it's been my pleasure. Have a great rest of your day.

- Thank you, you too.

- [Narrator] Thank you for listening to Further Together: The ORAU Podcast. To learn more about any of the topics discussed by our experts, visit www.orau.org. You can also find us on Facebook, Twitter, and LinkedIn @ORAU. And on Instagram @ORAUTogether. If you like Further Together: The ORAU Podcast, we would appreciate you giving us a review on your favorite podcast platform. Your reviews will help more people find the podcast.