Casey Ivanovich:

I was actually able to co-found a mentorship program through this group, which kind of paired individual students together, one undergrad student with one grad student, so that they could discuss and talk through some of these challenges and make sure that they had kind of a support system. And so that was an amazing experience for me. We iterated every year to try to improve the program, and by the time that I graduated, we had successfully matched about 600 students.

Bryan Campbell:

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 story 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 ORU podcast. My name is Bryan Campbell and I'll be guest hosting today filling in for our usual host, Michael Holtz. Michael and I work together in the ORAU Communications and Marketing Department, and I'm very honored to have this chance to be behind the microphone today. And one of the really amazing programs that ORAU manages is the NASA Postdoctoral Program, which we also call NPP. And we're very excited today to welcome one of the current class of NPP fellows to the podcast. So we have with us today, Casey Ivanovich. So Casey, welcome to the podcast. It's great to have you with us.

Casey Ivanovich:

Yeah, thank you so much for having me on.

Bryan Campbell:

So just to get us started, tell us a little bit about yourself. What's your background and what's your current role with the NASA Postdoctoral Program?

Casey Ivanovich:

Sure. So I just started as an NPP fellow at the end of August, so I've been on for a couple of months. And I am a climate scientist. I study climate extremes really broadly, but currently thinking about extreme humid heat. And so this is a topic that I studied for my dissertation as well, mostly thinking about the dynamics of where events happen and why they happen across the globe. These dynamics are very different from extreme dry heat events, and so we're really trying to understand why they come about and how we can better prepare for them.

So before starting at NASA GISS, I worked at doing my PhD at Columbia University, so just down the road in New York City, and I was in the Department of Earth and Environmental Sciences. Then before that, I took a couple of years off in between undergrad and grad school and I worked at the Environmental Defense Fund down in Washington DC. I was still on the climate science team, so working as a scientific researcher, but at a very impacts focused institution. And then before that I did my undergrad work at Princeton where I was in the Department of Geosciences, so very similar to my degree at Columbia where I was getting sort of a broad earth sciences background. So all of that kind of led me to where I am today now as an NPP fellow.

Bryan Campbell:

Very cool. So were you always pursuing a STEM career from the very beginning? Or how did you get interested in science as something more than just a subject in school, something that you looked at as a career option?

Casey Ivanovich:

Totally. So I think that it took a lot of navigating to get myself to this career stage. I was always really passionate about the earth in general, and I can remember one moment that sparked my interest in environmental sciences. In high school, I had a chemistry teacher who was just so passionate about the work that she did. And I can remember this one moment where she was at the chalkboard writing out very simple equations, as a high school chemistry class would be, and she turned around and paused and just said, "Isn't it incredible that we can model everything in the world just by using some numbers that we made up?" And for some reason that just really struck me, that earth is this beautiful system that we have worked so hard to understand and we've created all of these branches of science to be able to explain it. And that's really stuck with me and that has kind of developed this really awe inspired feeling around understanding earth systems since I was in high school.

So I think all of that really fostered this sense of needing to protect earth and needing to really work towards environmental stewardship. And so as I was going through college, that really informed the classes I was taking. I knew that I wanted kind of an environmental related career and area of study, but I wasn't sure what that was going to look like. And so I ended up in the Department of Geosciences at Princeton and I got this very broad earth sciences background. But even then I wasn't sure if I wanted to be in a scientific field. And so I kind of weighed the pros and cons of working in environmental policy or environmental science.

And up until my senior year of college, I had done quite a bit of scientific research. So at Princeton we're required to do two years of undergraduate research, and I had had some really positive experiences there. But I had spent my summers working at environmental nonprofits, and so doing much more qualitative work and on a variety of different environmental issues. And so really it was through talking with a lot of mentors, thinking about what kind of day-to-day work appealed to me the most that I really realized that I wanted a scientific career in research.

And so that led me to seeking out new opportunities to get different types of research experience. Most of my undergraduate study research was done in geochemistry, so in sort of a wet lab environment, and that wasn't a great fit for me. I spent the two years after I graduated working in climate science doing more computational research and just totally fell in love. It's been kind of a journey to understand what my role was going to be in a climate related career, but I'm so happy that I found the pathway that I did and had so many folks who were able to help guide me in that.

Bryan Campbell:

Well, as you said, you're relatively new to the program, just still getting your feet on the ground, but how did you very first hear about the NASA program and what kind of led you in that direction? And how do you see things going from here? I know you're still early in your time in the program, but where do you see this leading you after the program's complete?

Casey Ivanovich:

Totally. So I think that having gained some experience at a non-university setting while I was at a non-profit in DC in between my undergrad and grad trainings, I really got a taste of the wide variety of research that can be done in this field. And I was really motivated to seek other opportunities like that out. And so I really am passionate about impacts focused hard science. So I love studying traditional atmospheric dynamics, but on topics that are very relevant to human society. And so I think that working at a government lab is a very mission-driven job. And so I was really motivated to seek out some kind of postdoc working at a government lab such as NASA to see how that kind of translated working at one of these government research institutions.

And so that was sort of the first opportunity that I had had to seek out these types of positions. And then there's lots of close relationships between NASA GISS, where I'm working now, and Columbia, where I did my PhD. And so there's plenty of opportunities to meet with individual scientists at NASA, and that's eventually how I met my new postdoc advisor, Ben Cook. And we had a lot of intersections of our work. He's a hydroclimate expert, whereas I am focusing mostly on extreme heat. And so there's lots of opportunities to learn from his expertise and kind of find the overlap in between them on these new projects.

Bryan Campbell:

So in this role, will you have a chance to do much of, I guess, field work out collecting data, or is your time mostly going to be spent analyzing the data that other people have collected?

Casey Ivanovich:

Totally. So historically, most of my work has been fully computational, using already processed and created products that are available publicly. So that's mostly the plan for my primary research. But I also have a lot of experience historically working with interdisciplinary teams. And so I would be really interested in finding opportunities to work with local communities, particularly on heat stress exposure. This is a major issue in every city around the world really in one way or another, whether it's a historical risk for extreme heat or something that's emerging. And so I would be really eager to seek out those opportunities and to start building those collaborations with either community groups or other research institutions to get some of those on-the-ground measurements. That'd be something I'd be really eager to do. But for my primary research, I'll be using mostly reanalysis data, which is sort of a mix between observational products and model products. And then here at GISS we run the model E global climate model, and so I'll be using some output from that as well.

Bryan Campbell:

You mentioned collaborating, that's a huge part of any scientific program. So where have you had some really pivotal moments collaborating previously, and where do you see some of those happening in your current role with NPP?

Casey Ivanovich:

Totally. Yeah, I think I've had a range of collaborations with interdisciplinary teams, from super informal kind of workshops that maybe are just a couple of days of overlap all the way to peer-reviewed science papers that come out with these different teams. So while I was at the Environmental Defense Fund, I did some work looking at quantifying the warming impact of different sectors around the globe. So this included international transportation or our global food system. And so that included interactions with people who are experts in international policy or agricultural scientists. And that was a really positive experience for me. There was a lot of growing pains in terms of everyone speaks a little bit of a different language in the different fields that they're in, and really being able to recognize everyone's expertise and what they're bringing to the table. But I think that it was so rewarding in terms of creating research that could reach more people, that could have more management and policy outcomes than perhaps a pure scientific research paper.

I've also now, in my work that focuses more on extreme heat, worked with a variety of different groups. I had an awesome experience a few years ago, we did a big workshop at Columbia, which was sort of co-led by Sam Mewis, who was a women's national soccer team player, thinking about the intersections of outdoor sports and extreme heat, whether that ranges from children's sports in schools or all the way up into professional leagues. And so those kind of conversations were really informative in the way that I have built out my research agenda as well. Other things have included summer camp administrations, so thinking about planning for those different types of organizations as well as working with financial institutions, thinking about how they need to incorporate climate data and extreme heat data into their planning.

And so I'm not sure how these kinds of interactions will directly influence the work that I'm doing for my proposed research as an NPP fellow, but I know that they influence the way that I ask the questions that I ask in my research. And so again, I really, I'm striving for creating research that has the largest impact it can, that it's very usable. And I think the best way of doing that is incorporating as many authors with as many expertise as possible. So I'm hoping to continue to build out those collaborations, particularly locally in the New York City area as well as broader regions as well. So time will tell as the fellowship continues over the next couple of years, but I'm excited to see how those go.

Bryan Campbell:

Well, if you want to study heat and humidity, we should welcome you to Oak Ridge, Tennessee sometime where we get some serious humidity in the summer, so we'd be a great field for you to come study at some point.

Casey Ivanovich:

Totally.

Bryan Campbell:

As you're thinking about collaborating, also mentoring is a huge part of any scientific experience. So who have been some of the key mentors for you along the way, and who are you looking to for that type of mentoring relationship in your NPP role?

Casey Ivanovich:

Totally. So I think that mentorship has been hugely helpful in my academic career. Before I entered this field, I didn't know anyone in this field. This is very different from anyone in my family or any close friends that I had had. No one has gone through this before. And so it took a lot to orient myself in terms of the social norms, I think especially, in academia broadly and in this field more specifically. So it had been really crucial for me to build out these mentorship relationships throughout the duration of my academic career. And so some of those people have been older students or more senior students, maybe grad students who have been in my lab groups when I was an undergrad or professors that had been really kind to give me their time and advice and perspective throughout the years, particularly in undergrad. And that continued up into grad school as well.

And so I'm really excited as time goes on, especially for my postdoc now. So I'm lucky to be co-advised primarily by Ben who sits at GISS, and then sort of informally by Sonali McDermid who sits at NYU, to be able to get sort of joint mentorship from them, but also just expand my network into the greater NASA community. I'm really working to utilize, there's a lot of great resources that NASA puts out. Our center is sponsoring sort of a mentorship program that I'm involved with, and we're going to start meeting on Friday, which is really exciting. So I think just connecting with as many people as possible and seeing how those relationships naturally develop, I think will be a great step moving forward.

Bryan Campbell:

And in that same vein, have you had a chance to pay it forward a little by mentoring some younger students along the way?

Casey Ivanovich:

Yeah, absolutely. That has been, I think, really important to me throughout this experience. I just was so grateful for all of the care and guidance that I received throughout the years of my academic career that I just want to make sure that everyone feels like they're equally supported and they have people to go to with these questions. And so that has been really important to me in a variety of different ways to work into my kind of service back to the field.

So some of that has involved sort of direct research mentorship. Particularly during my PhD I did a lot of hands-on work with undergrad students, with master's students and with post-grad students, all of whom did an amazing job and produced some really great and exciting work. And I also am really passionate about more holistic social mentoring. So while I was a PhD student at Columbia, I was a board member of Women in Sciences at Columbia. And I was actually able to co-found a mentorship program through this group, which paired individual students together, one undergrad student with one grad student, so that they could discuss and talk through some of these challenges and make sure that they had a support system.

And so that was an amazing experience for me. We iterated every year to try to improve the program. And by the time that I graduated, we had successfully matched about 600 students. And it was just really transformative to see, I guess, how to make a successful program. We ended up developing a lot of materials. We had a sort of handbook as a guide to mentors and mentee pairs with lots of resources that they could go to. And I'm really grateful for all the feedback that we got along the way as well from both the mentors and the mentees about what they needed, about what makes a good mentorship pair. So I learned a ton as well about what I would look for in a mentor, how to facilitate those relationships and really match expectations between people. So that had been honestly one of the most rewarding components of my graduate studies and something that I'm looking forward to incorporating as I continue in my career path.

Bryan Campbell:

So this sounds like something you've already done a lot, but I'll go ahead and ask. If you were to have a chance to talk to one of these mentees, one of these up-and-coming younger scientists just trying to find their way through and they were looking to you, what kind of advice would you give them in a short moment of if they just, "Tell me something I need to know to make sure I'm moving in the right direction," what kind of advice would you give?

Casey Ivanovich:

Yeah, it's a big question. I think the biggest thing is to talk to as many people as you can. And it can be really difficult if you have a small department or if your department maybe has a certain culture that maybe doesn't feel as approachable as you would want. I think that that can be really hard. And I think it can especially be really hard for people who are gender minorities or people who have other historically underrepresented identities in the sciences. And I think the more people that you talk to, the more people you will find that you have shared experiences with, the more people you'll find who are open to talking about the challenges that you're facing. And it really behooves you to continue to reach out to people and to be a little bit brave in terms of asking for help and trying to connect with people.

And it can be really hard when you're in a academic hierarchy and you might feel like you don't have the power to make these connections, and that's something that's really hard to come up against. And so I think just pushing oneself to reach out to people, find these opportunities where they exist, can give you a support system and a community that can make everything a lot easier. It definitely doesn't solve all of the problems, but it definitely helps you feel like you're in this with other people and they're going through the exact same things that you are and they can give you some advice. I think that's really invaluable.

Bryan Campbell:

Excellent. Well, thinking about more like a peer-to-peer level, if you had a colleague who was considering applying to the NASA program, what kind of recommendation would you give to them or what kind of advice would you give to them if they were considering it?

Casey Ivanovich:

Yeah. So far, I've only been here for a couple of months, but it's been an amazing experience so far. And I think my biggest advice would be to reach out to potential advisors ahead of time. I was so lucky to be in the area so I could come and meet with Ben before applying. But in general, we can do so much on Zoom and we can do so much virtually that having conversations ahead of the application process was extremely important for me to identify if it was a good fit between me and my potential advisor, to talk about potential research ideas and really flesh out what was interesting to the both of us. And I think that that helped my application immensely, and it's helping me now to really have a good grasp on what I want to do and how I want to pursue it, and also how I can leverage the expertise of my advisor to really build out a powerful research agenda.

So yeah, I think that those initial contacts when you're thinking about potentially applying to this program are really helpful in terms of deciding how to apply, who to apply with, what kinds of proposals to write. I think that'd be my biggest advice.

Bryan Campbell:

I know with any level of research, you can't know what the results are going to be, but if you could imagine into the future, what is your best case scenario for what kind of things you'll accomplish during your time and what kind of results will come from your research while you're with NASA?

Casey Ivanovich:

Totally. So I think we all think that our fields are very interesting, but I think that my field is very interesting in terms of studying extreme humid heat because it's very rapidly developing. So in the climate sciences, we've studied extreme heat for decades. And in the health sciences and kind of physiology, people have known that humid heat, so very high temperature and very high humidity impact our health significantly, again, for decades. But the mesh of the two is quite new. Maybe in the last 10 years or so, it's really been rapidly developing. And so there's a lot of questions to be answered within this field. And I think that that is such an exciting time, particularly to be an early career scientists studying this.

So I think we're starting to really narrow in in the field on where extreme humid heat events are happening, when they might be happening, but we don't have as much of a sense of the dynamical reasons why or what are the process-based drivers that are creating these extreme events. And so I'm hoping to narrow in on, I'm not going to answer all of those questions certainly, but to narrow in on some aspects of that, particularly thinking about the intersection of surface moisture, so whether that is precipitation or soil moisture, how those kinds of phenomena or characteristics drive extreme dry versus humid heat events. And so those of course are going to have really big implications for I think management and policy in terms of how we adapt to climate change, how we plan for these extreme events. So I hope to just carve out a little bit of those questions and hopefully give us a little bit more process understanding of how these extreme events happen.

Bryan Campbell:

Very cool. Well, that kind of brings us to the end of our time. But it's so exciting to see somebody so passionate about their work and so excited about what the future is going to bring with the research that's going on. So thank you very much for giving us your time today, and we look forward to seeing what you and the others there at Goddard come up with in the next few years, and just want to wish you all the best.

Casey Ivanovich:

Wonderful. Thank you so much. And thanks so much for having me.

Bryan Campbell:

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.