

Transcript for Kelly Núñez Ocasio, ASP Postdoctoral Fellow at the Mesoscale & Microscale Meteorology Laboratory at NCAR

Clear Skies Ahead: Conversations About Careers in Meteorology and Beyond

July 11, 2023

**Kelly Savoie:**

Hello, Clear Skies Ahead listeners. This is Kelly Savoie and I'm hoping you can take a moment of your time to rate and review our show wherever you listen to podcasts. We have produced over 60 episodes and you can help us reach even more individuals that will benefit from the diverse experiences shared by our guests. Thanks so much for listening, and I hope you enjoy this new episode.

Welcome to the American Meteorological Society's podcast series, Clear Skies Ahead: Conversations about Careers in Meteorology and Beyond. I'm Kelly Savoie and I'm here with Matt Moll and we'll be your hosts. We're excited to give you the opportunity to step into the shoes of an expert working in weather, water, and climate sciences.

**Matt Moll:**

We're happy to introduce today's guest, Kelly Núñez Ocasio, ASP postdoctoral fellow at the Mesoscale and Microscale Meteorology Lab at NCAR. Welcome Kelly, and thanks so much for joining us today.

**Kelly Núñez Ocasio:**

Thank you very much for having me. I'm very excited to be here.

**Kelly Savoie:**

Kelly, could you tell us a little bit about what sparked your interest in science and how it influenced your educational path?

**Kelly Núñez Ocasio:**

Yes. It all started back in 1998 when Puerto Rico was hit by Hurricane George. I remember being so scared, I was a kid back then. I was scared of the sound of the wind, the trembling walls, and what was a fear slowly evolved into an interest and eventually a passion. My mom says that after the hurricane, I was very much interested in the clouds, in the weather forecast on TV, especially the satellite images, which showed the ongoing weather. So I think that's where it all started.

**Matt Moll:**

So what opportunities did you pursue inside and outside of school that you knew would be beneficial to securing a job in the profession?

**Kelly Núñez Ocasio:**

That is a great question. The very first opportunity I pursued encouraged by my mom that I think was a milestone for my future career in studies was participating in a NOAA weather camp when I was in 10th grade.

I remember I was the youngest weather camper in that cohort and learning so much about the weather and especially where I could study meteorology in Puerto Rico, I learned that the only university that offers a degree in meteorology and atmospheric science in Puerto Rico is the University of Puerto Rico at Mayaguez. This university offers a curricular sequence in meteorology, but it must be paired with a major in a hardcore science or an engineering degree. And I eventually completed my Bachelor of Science in theoretical physics with that curricular sequence in atmospheric science and meteorology. And during that time as an undergraduate, I became an active member of the AMS local chapter, and that really opened a lot of doors for me.

It was the start of my career network and where I took on many leadership roles. I think in addition to that, being involved in the local chapter, I also participated in several internship opportunities. I was awarded the NOAA Educational Partnership Program fellowship that provided me with two years of funding and two internship experiences across different NOAA offices. The first year I interned at the Climate Prediction Center at College Park, Maryland. There I learned about the El Nino-Southern Oscillation. And the second year I interned at the Hurricane Research Division in Miami, Florida where I studied hurricanes. And I was even able to participate in a reconnaissance aircraft mission, and I flew into a hurricane with the hurricane hunters and-

**Kelly Savoie:**

Oh wow. Cool.

**Kelly Núñez Ocasio:**

Yeah, that was a dream come true. I even got the official hurricane hunter certificate because in my mission we were actually able to penetrate the eye-walls of the hurricane various times, and that's how you get the certificate. So it was really a dream come true.

**Kelly Savoie:**

So what was that like? Was it scary? Was it... I can't imagine that experience.

**Kelly Núñez Ocasio:**

Yeah, I was so excited, but it turns out that when we flew into the system as a tropical storm, it was much more bumpy and nauseating than-

**Kelly Savoie:**

Oh, no.

**Kelly Núñez Ocasio:**

... when we flew into it as a hurricane. When it was already a hurricane, I guess it was pretty organized and the pilots were able to fly into it and have a better sense of it. So that was unexpected for me actually. I thought it was going to be a bumpy ride as a major hurricane, but it was really fun. I was able to help the scientists collect some of the information of the dropsondes, where they were dropped, location, time. And so it was a very enriching experience.

And then the last internship I completed during my undergraduate years was a research experience for undergraduates, an REU, at Penn State University. And that's where my passion about African easterly waves and the formation of hurricanes really started. And it is interesting, I continued to collaborate with my mentor and the people I worked with during this internship, and that actually led me to a graduate

research assistantship at Penn State. And who was my mentor during the RU became my PhD advisor. And there I completed my PhD at Penn State. And during grad school I participated as well in the AMS activities, involving myself in conferences, seminars, workshops. I also visited research laboratories. And I think that that participation together with all these experiences led me or were the building blocks that led to my next career step.

**Kelly Savoie:**

Wow, that's amazing. I think it's really great that you started with internships even in high school when you were a sophomore. And it's great that NOAA offers that because I know there's not a lot out there for high school students. How did you find out about that opportunity?

**Kelly Núñez Ocasio:**

So my mom saw it in the news. It was our local meteorologist back then had a science section, science and opportunity section. So it was promoted via the local news. And that's how my mom learned about it. And then she was like, if you really want to study weather, this is your chance. So I'm very fortunate and grateful that she pushed me towards that.

**Kelly Savoie:**

So now that you had finished all those internships, you had your PhD, did the graduate assistantship, so what was your first job in the field and how did you end up where you are now? Or is this perhaps your first position?

**Kelly Núñez Ocasio:**

Right. So my first and current job is actually, this one, is being an advanced study program postdoctoral fellow at the Mesoscale and Microscale Meteorology Laboratory at NCAR. And I've been in this position just a bit over a year and a half now and enjoying it very much.

I think how I ended up here is a result of establishing myself as an atmospheric scientist research in the field of tropical meteorology. And I think it's also due to the accumulation of experiences acquired like those internships, building my network, visiting these research labs, my involvement with AMS, all of those led me, I think to be awarded this fellowship at NCAR.

**Matt Moll:**

Can you talk a little bit more about the fellowship at NCAR? What's a typical day like? What are some of the activities that you're doing on a typical day?

**Kelly Núñez Ocasio:**

Yeah. Each day in my job can look very different, I like that a lot. I'll start by saying that because of this fellowship, I have the flexibility to explore different research opportunities and chase my creativity as a scientist and researcher by asking and pursuing my own scientific questions. And so with that one day can be me sitting in front of the computer all day doing code, analyzing data. Some days can be trying to run a numerical weather prediction model and making sure all the bolts and knobs are working. And then there are days where I'm just doing thorough literature review and I spend hours and hours reading research and publications. There are other days or perhaps months at times where I'm out in the field as a field scientist. Last year for example, I was part of two research field campaigns, PRECIP and the NASA CPEX-CV and I get to travel around the world through those experiences.

For example, in CPEX I was off the coast of Western Africa and it was also an aircraft mission type of field campaign where we flew into convective systems and we flew into African easterly waves. It was like a dream come true to be able to actually see them in person and fly into these systems that I usually study in the computer. And so during that time, you're for example, releasing radio signs, you're analyzing the data that you're collecting in the field. You're also being a field mission scientist. So sometimes you get to fly the mission and work with the pilots to fly into whatever region of the system you want to measure. And sometimes it's that we were in the ground supporting those flight mission scientists.

In the field campaign PRECIP I was actually in the Pacific, so I was situated in this Japanese island. It's very little, it's right next to Taiwan, it's called Yonaguni. And I spent a whole month there studying the weather and releasing radio signs and understanding what we were observing in the radar and working with colleagues, international colleagues from Japan, from Taiwan. It was really an enriching experience. So I get to do this as part of my job and I feel really fortunate about that.

I will say that a big other component of my job is actually communicating science and communicating with folks either the general public or the science community. And I do that across different platforms. Sometimes it could be conferences, sometimes it could be social media. I find myself, especially during my post-doctoral years, being invited to seminars and workshops and presenting my research in that way. And that way I'm also building and augmenting my network and collaborators.

**Kelly Savoie:**

It sounds so amazing and varied. Is there one thing in particular that you like most where when it's a day when you're doing that, you're like, oh, great, I'm so excited I get to do this today?

**Kelly Núñez Ocasio:**

That is a hard question. I like a lot of aspects about my job. I think what I like most if I had to pick something is I get to learn every day something new either through my research, through other scientists' research, by exchanging ideas and collaborating with scientists across the nation and even internationally.

And I like that every day is not the same. And I get to share, again, my research with the general public and the scientists. And another big aspect of my job is the fulfillment. At the end of the day is that fulfillment that I'm able to save life and property, either through directly communicating the science to the public and helping them get informed or indirectly through the research by informing the weather and climate models and adding to our knowledge of the tropical atmosphere.

And then I think the other very big part of my job that I like the most is the fact that I can spend a lot of time doing service. I love mentoring. I am a big advocate for DEI efforts for diversity, equity, and inclusion. And so that I get to spend time doing that internally in NCAR externally through AMS, I am an AMS CHALA member. It's very fulfilling. And in that way, I can also help the younger generations come to the field and push them forward as well.

**Matt Moll:**

So what would you say are some of the biggest challenges you face working in the field?

**Kelly Núñez Ocasio:**

I think it's a double-edged sword situation. I think the aspects that I like most about my job can also be the most challenging ones. Keeping up with the literature is very challenging. Every day there's new research out there. The coding aspect, the fact that you have to be savvy in order to be able to manage

this big data, what we're calling today this big data, every day there's more and more data availability and how are we handling it. So it is important to be savvy in that way, to actually be able to produce results and analysis. And communicating the science both written and orally is also a challenge I think every day for me and every day I'm learning something new.

**Kelly Savoie:**

Kelly, could you talk a little bit about your research on the genesis of tropical cyclones and how their interactions will evolve in the changing climate?

**Kelly Núñez Ocasio:**

Of course. So my research has been evolving and the main aspect of my research has been focused on understanding how a hurricane forms, especially in the Atlantic. And so as you probably know over the Atlantic African easterly waves, which are the synoptic scale disturbances over Africa can be the seed that form a hurricane.

And so in my research, I've studied how that African easterly wave interacts with convective systems with thunderstorms and clouds and how that interaction is important to ultimately a system to undergo genesis. And so my research has found key differences between the characteristics of those clouds that are coupled to waves that do not become hurricanes, and those that do. And it's all about the position of where these clouds are located with respect to the African easterly wave. And so I found that when the clouds and those thunderstorms are very close to the vortex, to the trough of the African easterly wave, that's actually good.

It provides them with that extra energy from that diabatic heating and condensation that is happening within the cloud to the vortex and ultimately helps the system grow into a hurricane. Another interesting result from my work has been that if you divide Africa into three different regions, so say eastern, central and western Africa, where these African easterly waves propagate, what we found is that those African easterly waves that originate over eastern Africa, and so those that are influenced by topography such as the Ethiopian Highlands, those easterly waves are actually more likely to become hurricanes than those that originate over either central or western Africa.

And what we propose in that research is that it's because these African easterly waves spend more time interacting with clouds and thunderstorms over the continent and interacting with the moisture associated with the monsoon. And so they become more prepped to be candidates of becoming a tropical cyclone. And in my more recent work, I've actually been able, through the use of numerical weather prediction, alter the moisture in the atmosphere and see how that affects the evolution of an African easterly wave, and ultimate genesis.

And what's interesting, what I'm finding is that in the experiments where I increase the moisture everywhere in the atmosphere, the African easterly wave ends up being a hurricane, but it's a weaker hurricane than in the control experiment. So in other words-

**Kelly Savoie:**

Interesting.

**Kelly Núñez Ocasio:**

It's very interesting. What I'm finding is that more moisture everywhere in the atmosphere, which we could think about it as our climate is changing, with an increase in temperature we'll have more moisture availability will not necessarily lead to more intense African easterly waves that will lead to

more intense tropical cyclones. Now of course, this is one research project and there's many out there, but it's ongoing work and I'm very excited about it.

**Kelly Savoie:**

Yeah. Well, thank you for that explanation because I'm not a scientist, but I could follow that and you explained it very well, and it is, it's super interesting.

**Kelly Núñez Ocasio:**

Thank you so much. I wanted to mention something that I forgot in the previous question about the challenges of my position right now. I think it's important to share with the listeners. Being a postdoc is a temporal position, and so when you're doing your postdoctoral fellowship or your postdoc position, you're moving forward your research, but at the same time, you're also looking for your next career step. You're also applying for jobs.

And that I think has been a very challenging aspect of being a postdoc, to be able to be strategic about what you want to pursue, what would be your next career step, while also doing all of these great work and communicating science and services. So for me, for example, I wish to stay as a research scientist. That's what I would like to pursue in my next career step. So I've been having to be very strategic and really looking into what opportunities are out there for me to be able to continue as a researcher.

**Matt Moll:**

Oh, that's great. And that really leads us into our next question. I was going to ask, I'm curious to see what you think about, what are some of the qualities and attributes that you feel that a postdoctoral fellow needs to be successful?

**Kelly Núñez Ocasio:**

I believe a postdoctoral fellow can be successful in their research and careers if they have the skill to effectively communicate the science both verbally and written. Another important quality is to be able to do both independent and collaborative research that will open opportunities to expand your research portfolio and your contributions to the field. In perhaps the more technical side a postdoc that is savvy in coding and actually using both model and observational data sets, I think it's an important quality as well.

**Kelly Savoie:**

So would your advice for students and early career professionals looking to establish careers in the field would it be similar, learn coding and have some good communication written skills? What are some of the courses that you found helpful or opportunities that you pursued that helped you get those skills refined?

**Kelly Núñez Ocasio:**

Definitely. I would say all those opportunities, either coding classes, as you mentioned, internship opportunities, classes where you can work more on your communication skills. But I think an important advice to give students and early career professionals is to make sure that you at least have one mentor, a person that you can trust and they can guide you in your career. I think that's really important. Build your network and connections, build the portfolio through publications, collaborations, and be willing to

learn new tools, different research topics. Keep up to date with the literature and don't be afraid to ask questions.

**Matt Moll:**

Well, we're so grateful for everything you told us about your career. However, before you go, we always ask our guests one last fun question at the end of our show. So what is your favorite food?

**Kelly Núñez Ocasio:**

I love this question. My favorite food is called Mofongo. It is a Puerto Rican delicacy, at least in my opinion, it is fried green plantains mashed to the shape of a small bowl, and it can be stuffed with veggies or meats. I like to have it with shrimp bathed in a garlicky sauce. It's so delicious. My grandma made Mofongo for me all the time growing up. She passed away, and so it's a way for me to connect with my heritage and remember my grandmother.

**Kelly Savoie:**

Oh, that sounds interesting. So explain again, you take the plantains and you mash them, and then that shapes what you stuff?

**Kelly Núñez Ocasio:**

Yes. So it's the green plantains. You first fry them in little pieces, then you mash them together with a pilón, that's the tool that is used and helps create that boat shape. And then people stuff them with veggies or different meats. I personally think that stuffing them with shrimp and garlic is the best way to go about it. It's so yummy.

**Kelly Savoie:**

It sounds so good.

**Kelly Núñez Ocasio:**

When you mash it becomes a soft consistency. It's not hard at all. So it's really yummy.

**Kelly Savoie:**

It sounds delicious and very healthy too, because it sounds like it's lots of vegetables and protein, so I may have to try that,

**Kelly Núñez Ocasio:**

For sure.

**Kelly Savoie:**

Well, thanks so much for joining us, Kelly, and sharing your work experiences with us.

**Kelly Núñez Ocasio:**

My pleasure. Thank you so much for having me. And if listeners ever want to reach out, you can find me on email and social media. I'm very happy to answer any questions you may have about college choices, internship opportunities, and about an atmospheric research scientist career.

**Matt Moll:**

Well, that's our show for today. Please join us next time, rain or shine. Clear Skies Ahead: Conversations About Careers in Meteorology and Beyond is a podcast by the American Meteorological Society. Our show is edited by Peter Trepke. Technical direction is provided by Peter Killelea. Our theme music is composed and performed by Steve Savoie, and the show is hosted by Matt Moll and Kelly Savoie. You can learn more about the show online at [www.ametsoc.org/clearskies](http://www.ametsoc.org/clearskies). And you can contact us at Sky podcast at [ametsoc.org](http://ametsoc.org) if you have any feedback or would like to become a future guest.