



*Meghan Duffy - Susan S. Kilham Collegiate Professor of Ecology and Evolutionary Biology, Associate Chair for Undergraduate Studies - FACULTY*

*This transcript has been edited and condensed for clarity.*

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## **Her Journey Into Research & Going Blue**

**Cherish:** So just to start off, could you tell me a little bit about yourself and how you came to be at the university?

**Meghan:** Yeah, so I'm a professor in Ecology and Evolutionary Biology. And I ended up here because it's a really wonderful university. It has amazing students. It has amazing resources. And my research focuses on aquatic ecology and disease ecology, and all of our field work is done in lakes. And Michigan has some amazing lakes.

**Cherish:** You might call them "Great," in fact.

**Meghan:** Yeah [laughter]. So we don't work on the Great Lakes, but which is always a little here in Michigan, people, right when you say you work on lakes they think it'll be the Great Lakes, but we have lots of great inland lakes, too. And so we work on those. So before I was here, I was at Georgia Tech, and it was much harder to find field sites there. And yeah, here we have so many amazing field sites within a 45 minute or so drive off campus, which is really great.

**Cherish:** Yeah. And then, so you mentioned Georgia Tech and stuff before this, would you—? Sorry, I'm not phrasing this the best way. But I guess I'm curious, could you tell me a little bit more like was this always kind of the direction of study that you anticipated, that you expected to go in?

**Meghan:** No. Yeah, I think it's funny, especially when I talk to students, they think I was born with this path in mind. And that was absolutely not the case. So I'm originally from New York, I'm from Long Island, very close to JFK airport. And my mom's a nurse, my dad was a New York City firefighter—everyone in my family had these very practical professions. And I went to college knowing I was interested in biology, but I didn't know what I wanted to do, other than that I was not pre-med. That was kind of like all I had figured out. And then it was really just like, a variety of very fortunate experiences that I had while I was an undergrad like, sort of taking some classes and getting connected with some people and then getting connected with research. So I did research in a lab when I was an undergrad. So that was at Cornell. And then, I started working in the lab with a grad student, because she worked on fish, and I thought fish were pretty cool. And then I switched to working on a different project in the lab that was focused on lakes. And that was when I really started to fall in love with lakes. And I love them for a variety of reasons, but one is they allow - so as an ecologist, I want to be able to study multiple populations. And with lakes, I know, I have one population here, and another population here, and another population here. Yeah, there are these very clearly structured populations that are all near each other. And that, that was very appealing. And then I also just fell in love with the little animal that we study, which is called daphnia, which is something I had never heard of before I started doing work in this lab as an undergrad. But they're really important ecologically. And they're also a good system for studying and so yeah. When I started college, I didn't have any idea of what my career would be. But then by the time I finished, I was like, Oh, I really like doing this type of work. And so then after that, it just became like, how do I keep doing this type of work?

**Cherish:** Okay, well, thank you so much for sharing that. I can just see the excitement on your face talking about it. I guess I kind of have two things branching off of that: one is, really, I just wanted to clarify how long have you been at U of M?

**Meghan:** I think I just hit the 12 year mark.

**Cherish:** Okay. I [should] say Happy anniversary!

**Meghan:** Yeah, we moved here, it was like right around this...we moved in the summer. And my daughter, who's now 13 was 1, so that was 12 years ago.

**Cherish:** Well, I think it seems - I'm glad that you've liked it and that you've stuck around.

**Meghan:** Yeah.

**Cherish:** And then kind of like building on that then with your research, and now your time at U of M. You know, like I reached out to you, in part because Jill Myers told me about some great research you did a few years ago. And I'm curious if you might be willing to talk a little bit more about what led to that project?

## Teaching BIO 171 & An Eye-Opening Study

**Meghan:** Yeah. Yeah. So that came out of right when I started here. 12 years ago, I moved right into teaching bio 171, which is one of the introductory biology courses. So it's the one that focuses on ecology and evolutionary biology. And I have taught that course a whole lot of times now, I don't know the exact number, but a lot. And over my time teaching it I, we've made a lot of changes. And one of the things probably I can't even remember [the] timing, at this point, but several years ago, we wanted, I really, I spent a lot of time updating the climate change lecture, or unit in the course, because it's so important, right? It's like, one of the most important topics for our students today. And so I wanted to really communicate about it as well as I could. And in updating that, I realized one of the like, number one lesson of science communication is to know your audience. And I realized I didn't know my audience, I didn't know what students were thinking when they came into the course. And then I also wanted to get some sense of whether the teaching was effective. And so were students, were they learning about climate change, were they feeling empowered to act about climate change. And so we ended up doing a study<sup>1</sup> where we surveyed students before and after we taught them about climate change, which led to the study. I had two amazing collaborators on it. So Susan Cheng, who's now in engineering here as a DEI lead. And then J.W.Hammond, who was a grad student at the time. And it was, it was super interesting to work on. And one of the things I learned from that is that almost all of the students arrived in the course accepting that climate change is happening, which I didn't, I was stunned. Like when I first started analyzing the data, and I saw 98% of the students arrived in the course accepting climate change, I was like, I did something wrong here. I was like, Okay, there's something wrong in my code, or, you know, like, I thought I had messed something up, but no, like, they basically all arrive in the course accepting climate change. And because I hadn't known that originally, I spent a lot of time being like, climate change is happening, which they didn't need. They knew they were all like, yeah.

**Cherish:** They were like, duh, of course [laughter].

**Meghan:** And so then I realized that's an opportunity then right to like, go deeper and help them develop a better understanding of why. So they generally accepted that climate change was happening. But there was a lot of variation in how confident they were in their ability to talk about what types of impacts there would be, when those impacts would happen. So a lot of them, coming into the course would think, they would say things like, well, it's not going to affect me, but I don't want my grandchildren to be affected. And then by the end of the course, they were

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<sup>1</sup> The study in question is linked [here](#), with a related follow-up publication by Meghan [here](#). Meghan was also interviewed about the study for part of [this](#) Washington Post article about Eco-Anxiety.

like, Whoa, this is affecting me. But also, and one of the things that was like the most striking about that was, we realized I was making them very anxious. During class, because I was, you know, I especially came in with this idea that I was 'I had to teach them it was real.' Yeah, they already thought it was real. And so then they were like we know, we know. Right? And so one student on the student evaluations of teaching described having a panic attack in the middle of the lecture. And I was like, Whoa, that is not what I wanted. And so that really changed how we teach about it. And so we added in a lecture that I think of as "reasons for hope". And there are! And now I think over the past couple of years, a lot more people have come to realize this, for, you know, sort of studies like the one that I did, where we realized that when we were communicating about climate change, we were leaving students feeling hopeless and disempowered. And one of the things if you look at definitions of climate literacy, a climate literate person isn't just able to tell you that climate change is happening and why. They also feel empowered to act on their knowledge. And the teaching we were doing originally was not leaving students feeling empowered. So we've tried to update the course. And we're doing more updates this summer, to try to really emphasize the reasons for hope. And there are - like renewables, right, renewables, we've made so much progress in battery technology, like there are reasons for hope there are things students can do. And so we now try to emphasize those more instead of the doom and gloom, which is, unfortunately, where I was at, maybe 10 years ago or so.

**Cherish:** No, well, thank you so much for talking about that. I appreciate getting the note around hope. And it makes sense that you just have this balance of accidentally leaning into climate anxiety, which is, there's that foundation, but wanting to make sure, how can we look past that or look ahead?

**Meghan:** Yeah.

**Cherish:** So yeah, no, thank you for branching out or telling me more about that. I'm curious, cause you said you've taught it quite a few times since then, have you considered doing a follow up [study], do you know? Or is that something in the works?

**Meghan:** Yeah, we have the - one of the challenges at this point is just finding the time to do it, like there's so many things to do. There's also - there's really interesting work to be done looking at...So the analyses that we've published have been the ones on, like, the quantitative, you know, rate on a scale from one to five, how you feel about whatever. But we also had qualitative free response data that was super interesting.

**Cherish:** Yeah.

**Meghan:** And I think it'd be really interesting to redo the survey, and especially look at some of the qualitative differences with the different way we teach now.

**Cherish:** Yeah, to think about that comparison. I assume that's where the panic attack quote came from before.

**Meghan:** Yeah, right. And so it's trying, yeah, so I think that would be super interesting. Qualitative analysis is really hard, and not something I know. So that's something where hopefully, someone else will be able to take that on. Because I think there would be really interesting things there. I'm actually not going to teach 171 this coming year, so this will be a big change for me, my follow up will not be teaching intro bio. Instead, I'm gonna teach a 300 level course on the ecology and evolution of infectious diseases, where climate change is also really relevant. But it's interesting...it's different, right? So it's not - in intro, bio climate change is like a whole unit. And it's explicitly a focus of the course. With an infectious disease course, we'll talk about how climate change is influencing infectious diseases. I'm actually having a bit of a harder time thinking of the reasons for hope, which is sad. But it's, but I am very aware that I don't want to just teach about [how] vector borne diseases are going to get worse, you know, like I don't, I am very aware that there are risks of really focusing on the kind of doom and gloom side of things. And so that's something I'm thinking about as I think about how to teach this new course.

## **An Average Day as Professor, Researcher, & Associate Chair**

**Cherish:** Well, I appreciate you sharing that. It was kind of a perfect transition into where I did want to kind of bring this back to actually a little more about your current research and work. And one of the things that I kind of have to ask is what sort of an average day for you looks like working at U of M?

**Meghan:** Yeah, is there an average day?

**Cherish:** I know it's not typical.

**Meghan:** Yeah. So one, one of the ways I think about it is I wear many hats. And so I run a research lab, the research focuses on infectious diseases. And we have a set of 15 lakes in the area that we study to understand the ecology and evolution of infectious diseases. I don't do a lot of the hands-on research anymore. Like I'm not in the lab very often, collecting the data. I'm kind of the backup person. Like if there's a really big experiment or someone is sick or something then I step in and realize daphnia are very small for my middle aged eyes. So yeah, mostly I am meeting with people in the lab and helping them plan experiments and analyze data and write up their results. And just sort of generally mentoring them. I do a lot of writing myself. So writing grant proposals and writing manuscripts and analyzing data. But then also, right, teaching. So I'll be teaching a new-for-me course in the fall, so teaching is going to take up quite a bit of time, because I'll have a lot of new materials to prep for that. But I think it'll also be super fun. I'm the Associate Chair for Undergraduate Studies in the department. And so I also spend a fair amount of time on things like thinking about our curriculum, and you know, what courses are we teaching? Are they all staffed? Or do we have something coming up where we need to, you know, find someone to fill in for someone who's going to be on leave or right, like sort of a lot of things related to that. So one of the things I really like about the job is I do a lot of

different things. And I find that really interesting. So each day is kind of different. And then within a day, I do a lot of different things. And I like that a lot.

**Cherish:** Yeah, it's never a dull day, variety is the spice of life.

**Meghan:** Yes.

**Cherish:** Okay, well love hearing that [and] appreciate you sharing. It seems to be, I think, a common theme among academics, that there are a lot of hats but a lot of variety, which is nice.

**Meghan:** Yeah.

**Cherish:** This is where I had, also, just one other comment, kind of wanted to note when you were talking about your upcoming class, I, I'm trying to think about how to phrase it. Where I just like think about awareness and connecting like action to, or awareness to action, is I think is the thing because I recognize those thoughts around the concern of the doom and gloom, like reiteration, and I think, just as long as it's doesn't end with just the discussion and talking about—even if it is like, I know, there's probably...you're the expert on this, there's certainly probably those reasons for concern you have in mind.

**Meghan:** Yeah.

**Cherish:** Maybe it doesn't have to be like a full solution to feel hopeful about what to do?

**Meghan:** Right. Yeah, the main thing I've been thinking about, is there's something called One Health, which is this idea, right? It's like things are very interconnected. And so by, say, conserving habitat, and sort of minimizing some of the human impacts, we can also then protect people against infectious diseases. So a lot of times a new disease is able to spread because we've kind of changed the way species are interacting. So humans now are living right next to a forest. You know, like we sort of changed distributions of where species are and where they interact. And so that is something where that is a reason for hope, right? It's sort of like, things that are win-win are reasons for hope. And so that's the main thing I've been thinking about emphasizing. But yeah, it's, I think you're exactly right. Then also trying to think about, like, what's a specific thing that students could do that would let them take action if they were interested? Yeah, you look like you had a thought?

**Cherish:** Oh, no, I was just thinking about what, I think what I love, when sometimes like asking these different things is sometimes like, oh, this kind of connects to this other question [I was planning to ask]. So just just thinking ahead in that sense.

**Meghan:** Yeah, yeah.

## Her Personal Tipping Point around Climate Change

**Cherish:** But I guess I'll take the opportunity to ask kind of one of these next core questions I have for everyone, which is, do you recall a personal tipping point for yourself concerning climate change?

**Meghan:** Yeah, I've thought about this. And one of the things that I think is interesting is, as an ecologist, I did not set out to study climate change. But at some point, I realized I was studying climate change, you know, we have a dataset on lakes here in Michigan, that's now, we have 10 complete years of data. So that, you know, we're at climate change scales and, and we look at [some of these, and] we've done some work on how changing temperatures can influence patterns of disease, or how the diet that the hosts consume can change disease and one of the things that has a really big impact are if they're eating cyanobacteria. And cyanobacteria are increasing because of climate change. And so yeah, so it was, I would say there was sort of this gradual realization that I was studying climate change, even though I didn't set out to study climate change. I think also, right after we moved here, so I moved here in summer of 2012. And so fall of 2012 is when Hurricane Sandy happened, and I'm from Long Island, the area I'm from was really hard hit, like the flooding came up to the stop sign on the street of the house I grew up in, like it was right there. The sewage treatment plant backed up into the basement of a house across the street. Very clear, immediate impact. And then there was, and so for me, that was one when I was teaching about climate change the first time I taught intro bio here, so that had just happened. And then I think for students, I felt like there was a bit of a tipping point...now I can't remember, it might have been 2015<sup>2</sup>, when there were like the three big hurricanes like Harvey, Irma. When those three all hit in the same year, that was the year with students were like, Duh, like, it's just, I felt like after that, there was sort of - that felt like a tipping point to me in terms of where the students were when they came in. There was no doubt.

**Cherish:** Yeah, yeah.

**Meghan:** So I think it's been like, sort of a series of things maybe in like, the different facets of my work life, right. Like some of the research we do in the lab. And then the way I teach and my personal life, yeah, were sort of like, sort of a few different points.

**Cherish:** Because then what you're describing, they were seeing it quite literally hit so close to home.

**Meghan:** Exactly, yes.

**Cherish:** And I'd say 2015, like '16, sounds about right, because I'm thinking I feel like that was close to when there were more national [and] international climate strikes.

**Meghan:** Yes, exactly, yeah.

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<sup>2</sup> Hurricanes Harvey, Irma, and Maria actually hit in 2017. You can read more about their impact [here](#).

**Cherish:** I'll say for myself, I was in high school then. So that's where I feel that. But okay, so I appreciate you sharing that. And I, again, kind of highlighting those different steps, because that's where I do feel like it's been a common thing as well. It's not really one moment. Yes, it's a lot of gathering things. And then building on that, I feel like it's come across to me with some of the teaching and the other things, and I don't want to lead too much, but—If you could get everyone on board with one specific belief or action around climate change, what would that be? And you can take a moment to think about it.

## Ways to Take Action & Be Hopeful

**Meghan:** The first thing that comes to mind...something that I feel like comes up in these conversations is sometimes there's a focus on—should we be focusing on individual actions? Or should we be focusing on large scale changes, like societal changes? That definitely is true with climate change, it's true with things like plastic pollution. And I'm always like, both, it's both! [laughter] And so I think that's one, one of the - that's like, the first thing that comes to mind is that we, there are multiple scales at which we can address this problem. And in which we should address the problem. And so one of the things we saw when we surveyed our students was, especially before the unit on climate change, they would do a lot of things like, I should ride my bike more. Riding bikes is great. I rode my bike here this morning. But we also need the societal changes. And one of the things, to go back to a question you were asking earlier, one of the things we never quite got, I never quite got to do in intro bio, but that I think could be super interesting is after the unit on climate change, ask the students to write a postcard to someone about what they learned. And what I would want to see is who they write to, and what they say. And I think, my guess is that some of them would write to a relative or a friend, maybe some would write to the mayor, or a pastor or like someone more in their local community, and then some might write to their senator or, you know, someone at a national level. And I think it would be really interesting to get a sense of what scale of action they're thinking of. And then also, I think it would be super interesting to see what they say because that would give some insight into what's resonating with the students. So I think that would be like, so cool. I just would need to clone myself to do it. So throwing it out there and a few things like on campus related to climate change. I'm like, would someone please do this because I think it'd be really cool.

**Cherish:** Honestly, I'm like taking notes and working with the Year of Sustainability team, I can float the idea.

**Meghan:** Yeah, I think it would be fascinating, and I think it would be, it would be really interesting to know what - and right, the students are gonna have great ideas.

**Cherish:** So it's, like, [let's] crowdsource.

**Meghan:** Yeah, exactly. And let's find out what they're thinking because they're gonna be thinking amazing things. You've got really great students.



**Cherish:** And I appreciate that. Again, it's connecting it to the action, showing them how to empower them to think about what they can do.

**Meghan:** Yeah.

**Cherish:** Also, having read the paper, I think it would be a perfect culmination, because quite literally "writerly".

**Meghan:** Yes, exactly, yes.

**Cherish:** And then, in some of the previous questions I've asked, you've talked about things to be hopeful about. And so like, you kind of addressed a little but I still want to ask even more directly, just what are some of those things that you're hopeful about?

**Meghan:** Yeah, I, so I mentioned a little bit about renewables. One of the things I found fascinating when I was sort of trying to pull together all of these things to be hopeful about is there's an analysis by McKinsey. So it's not like the Sierra Club, right, it's just a business analysis. And they say that switching to renewables, like going partially off the grid makes economic sense. And when I read that, I was like, what, like, I had no idea and I kind of follow this, but I hadn't seen that until I was like, really specifically looking. Something I really love now, so Katharine Hayhoe, who was here in April, gave a named lecture<sup>3</sup> - the Wege Lecture in SEAS.

**Cherish:** Okay.

**Meghan:** And she does amazing climate communication. And she's now started, she has a weekly newsletter. And it always includes, like, a reason for hope in it. And every week, there's something, right? So it's like, this country just elected a climate president, or this old church now is powered by renewable energy, or, you know, like it's, and yeah, so there are a lot of reasons. And yeah, so as I said, the renewables, I think, right. Also, the people really, clearly feel like it feels real and immediate, and they want to act. But another thing that I found when I was - when I was preparing that lecture that I thought was interesting was to think about, like, we can do hard things. So one of them was addressing the ozone hole. Like that was not an easy thing. That required a lot of countries coming together. But also one that I hadn't heard again, before I was sort of specifically looking for things, but was retrofitting buildings in New York for plumbing. Like it required a lot. It was very disruptive, right, to have to do that. It was very expensive to do that. But no one now is like, was that worth it?

**Cherish:** Yeah, of course.

**Meghan:** It made a better future to put plumbing in these very old buildings. And so yeah, so I think the more we can realize, like oh we, we have this capacity, I think it really helps. And so that, yeah, that's like, we can build a better future and it might be hard, and it might be

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<sup>3</sup> You can learn more about the event and watch a recording of her lecture [here](#).

expensive, but we can do it. And one of the things that I try to emphasize in intro bio is that it's okay to feel sad. It's okay to feel scared. That's normal. Often when I'm teaching about it, I get a little choked up like I'll sometimes like to mention something about one of my kids and like, right and it's like it's emotional to think about it but right, so then use that then to try to make a better future. So there's someone, her name is Rosemary Mosco<sup>4</sup>. She is a - she draws Bird and Moon is the name of the like--

**Cherish:** Comics?

**Meghan:** Comics, yeah. And she has these just gorgeous and powerful comics. And there's like, some of them involve these little birds, and then there's like a bird with an umbrella protecting the little birds, right? And it's like, it's okay if you're feeling sad and feeling bad, but also like, let's try to protect the next generation. Yeah, like little birds. So I show a lot of her things when I'm teaching intro bio or in like sometimes doing, like talking, say with fellow scientists about how we talk and teach about climate change, because it's just like, she captures it all perfectly.

**Cherish:** No, and I'd say I mean, it feels like a lot of what you're talking about also encapsulates a lot of those things coming together. And also I just want to say, I feel like it's very inspiring hearing these things, and I appreciate all that you're doing. And just keeping an eye on, wanting to be mindful of the time, I think like those covered my main questions, I just have one additional one, which is just is there anything else that you'd like to say? Or to share at the end I didn't ask about, anything you want to circle back to?

**Meghan:** Yeah, I guess the thing that just occurred to me is, I think, and this is a different thing that I've written about.

**Cherish:** Yeah, of course.

**Meghan:** But I think sometimes when we talk about climate change, and like, sort of, especially communicating to other people about climate change, we have this...There's sometimes a narrative that's like, you have to convert people from not believing or accepting climate change to accepting climate change. And it's this, the word that comes to mind is Evangelical, right? Like you're trying to convert people from one life to another. And one of the things that I - especially in talking with other scientists about - is like, we should be preaching to the choir, right? There's a lot of variation in that choir and then, you know, you can expand that. So it doesn't all have to be the choir, it could be the congregation, too. But we tend to think of like, preaching to the choir as this negative, like you're like badgering someone, or like, you know--

**Cherish:** Yeah, that already gets it.

**Meghan:** They already get it. But they don't necessarily know how to act. Like what actions they can take. Or maybe, right, or maybe they're feeling sad, and if you talk to them, then like, you can team up and do something together. So I think, I think when we think about, like, who we

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<sup>4</sup> You can view the Bird & Moon comics referenced [here](#).

should communicate with and who we should talk to about climate change. Sometimes there's the like, oh, find find the uncle who's like, you know--

**Cherish:** Yeah.

**Meghan:** – "this is all a hoax." And I'm not interested in that conversation. That's not the person I want to spend a lot of my energy on. I want to take the person who's like, well, I've heard about it, but like, I'm just a little unsure. I don't know what to do. And that's the conversation that I think can be, can lead to a lot of action and change. So yes, I'm like very much for preaching to the choir.

**Cherish:** I actually, I'm so glad that you brought that up, because I do want to say, I read the report, that one paper and I loved that title: Preaching to the Choir and Composing New Verses.

**Meghan:** Yes, exactly. Yes.

**Cherish:** So yeah, so I appreciate you circling back to that because I think that's a valuable conversation to have. And so, again, like I said, that covers my main questions here. So thank you so much for your time today.

**Meghan:** Yeah. Thank you.

- This concludes the interview transcript. -

*This interview was conducted in July 2024.*

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