Intro:

Welcome to Making Waves, welcome to Making Waves, fresh ideas and freshwater science, fresh ideas and freshwater science and why they matter to you. Making Waves, Making Waves is brought to you, Making Waves is brought to you with support from the Society for Freshwater Science.

Erin Larson:

I'm your podcast cohost, Dr. Erin Larson. For this episode, Dr. Eric Moody and I teamed up to interview Dr. Erin Eggleston who is a professor at Middlebury College, and Dr. Becca Barnes, who is a professor at Colorado College. Both Erin and Becca think deeply about mentoring and take action to improve mentoring in scientific fields. They will be sharing some of their thoughts and advice with us today. To start with, Erin talks about office hours as a potential mentoring space.

Erin Eggleston:

Time to interact with students and it's time that's set aside but often feels off putting for students to come at that period of time. And so there's a little bit of a barrier initially to getting students feeling comfortable coming to office hours. So that's an interesting barrier in trying to normalize that that time is set up for students and is meant to help them with class material or study habits or advising questions, all of those things are territory that can be covered in office hours. And so I have it outlined office hours every week and then by appointment meetings as well. And so some of that is creating a culture around what office hours can be. And so I try to emphasize that starting out in classes and then throughout the term making it an open space for students to come in and ask a wide range of classes.

Erin Eggleston:

And I find that often we'll bring a student into office hours is a question about content in a class and then it's a great time. If they're there I can touch base about how other things are doing, what's coming up, what's their next set of classes looking like for registration or are they thinking about studying abroad or research, it opens up opportunities for other conversations to happen. But there is an activation energy, a barrier to getting people to come and use that time or feel comfortable coming and meeting.

Eric Moody:

So related to that, one thing that I think it was you that I learned about is just the simple idea of having a doodle poll where you can have students fill out the poll and make sure that they actually can make it.

Erin Eggleston:

For sure. So if I set up office hours at times that work best for me, that's great for my schedule. But it means that in the past when I've just implemented office hours at a specific time, students don't often have the same time. And so I ended up making six other appointments a week for when office hours can't happen. So I tried to doodle poll or somehow get a sense of time availability of students who are enrolled in the class and try to match as best as possible. Of course, in the intro class I have right now 40 students, there's never going to be a perfect three hours a week that work for office hours. But I can try to optimize for timing that fits into different schedules and then still utilize the by appointment times as needed.

Erin Larson:

Office hours are one strategy for providing mentorship to students. Next, Becca describes mentor mapping a strategy she uses and teaches in workshops to help students and others identify gaps in their current mentorships.

Becca Barnes:

Well I think that in terms of one on one mentoring, it's really just about recognizing that the people who are seeking it from you just want the same thing that your friends want from you in terms of respect and advice and being honest. And I would say that in terms of more formal mentoring strategies, we have weaving folks that I've worked with to develop the undergraduate mentoring program that I'm part of and our science women's network. We've developed what we call mentor mapping, which is a really great way to think about our mentoring, very deliberate and it takes a village way. And I've done this with undergrads, I teach in an isotope class in the summer. So I'm doing it there with postdocs and faculty members. So I think that it doesn't really matter how old you are or where you are in the scientific evolution, but it can be really helpful because it just acknowledges that we all need various types of support.

Becca Barnes:

And that support is not just intellectual support, and if we're being honest, we often seek emotional support from people in our workplaces. And that can be okay, but it's also not something that everyone is comfortable giving. And I think that if we can... And those being intellectual and emotional being often things that can be really different, but you can also get it from one person. And so I think that the mentor map essentially gives us all of these different categories of mentoring that we all need. So who is someone who advocates for you? Who is someone who you can make sure they will hold you accountable for what really matters? So for a lot of my friends, that's their kids. We don't often think of our kids as mentors, but if someone's holding you accountable by making sure that you don't work all the time, that is mentorship.

Becca Barnes:

And so really expanding the idea of what mentorship is, it's not just your PhD advisor giving you read comments on your latest draft or being like seriously, why weren't you in lab until 10:00 PM last night or whatever ridiculous thing said to you. It's really about thinking about how to support the whole person. And so what I like about it is that one, generally people come away from this activity feeling more supported than they did coming in because they recognize that they actually have a lot of support. It also gives us a way to move forward and think about, okay, what do I need? So a lot of times people need an advocate or don't know if they have one, but you can't just go up to someone and be like, "Will you be my advocate?" That doesn't work.

Becca Barnes:

So generally, we brainstorm strategies for finding these people. And usually that knowledge is within the room. I'm not the one who's providing it, which also then reinforces the idea that you can gain mentorship from your peers. What we do is, I generally start with actually this picture and it's... I have no idea where my friend got it, but it's these two kids and one of them is pushing the other one out, what looks like a cat door or a dog door to a house. And so it's a hilarious picture, and I have a question under it, is this support? And so it's a funny picture, so people usually laugh and then we talk about, what is support? So depending on your perspective, that is an older or younger sibling who's like, "Get

out of the house, I don't want you," or the little one is like, "I really want to go outside," and the bigger sibling is helping them get outside.

Becca Barnes:

So pointing out to support looks different based on your perspective. And it really takes us away from that ladder analogy that we often use in academia in terms of looking up for advice and support as opposed to looking to the sides. So I think Sheryl Sandberg in her Lean In book, which I have some issues with, but in general there's lots of really great things in there. And I think one of the best parts about it is she talks about this as a jungle gym, and she talks about moving through your career, not just in a vertical way. And I think that that's really important because it also points to the fact that there's all these people to the sides of you that can also help. And I always think about my students as also being my mentors. They remind me of what I'm good at, which a lot of us as hypercritical humans need to be reminded that we're good at things and they also hold me accountable.

Erin Larson:

STEM creates some unique challenges for mentoring relationships. Erin describes some of those challenges, especially the way that STEM courses progress compared to other majors.

Erin Eggleston:

I think one of the challenges in navigating some of the STEM majors here, and I would imagine it's similar in other college environments, is that STEM courses and STEM majors are very hierarchical. I think there's a very specific trajectory that you have to migrate through and they build. So there are prerequisites for upper level courses and if you haven't taken three classes you might not be able to take the fourth. And so just getting students to, or working with students to have them be familiar with prerequisites and the ways in which they want to walk through classes and the curriculum is different than some of the other majors, especially on campus that have a more lateral structure where once you've probably taken one or a few of the intro classes, there's a whole range of options that open up and there's less structure for how those majors progress. So I think that's a difference for most of the STEM majors where the upper level curriculum has more to do with classes you've taken before.

Erin Larson:

Now, Becca discusses how asking for help can be challenging for STEM students and how mentors can help students with that discomfort.

Becca Barnes:

I think that the biggest challenge for my students is asking for help and seeing that as a weakness as opposed to a strength. And in my classes I definitely get on a little soapbox on the first day about the importance of being wrong and embracing how we're all wrong and for scientists and all of these things, but especially students who once they move into that research space and there is the lack of right answer or to find outcomes or at least I have observed that even the most confident student when there was a problem substitute, they were like, "Oh, I do not know how to do number three." And they could ask for help then, but it's like realizing that you can ask for help even if you're not quite sure what you need help with.

Erin Larson:

For some folks, being a graduate student might be the first opportunity they have to be a mentor. Erin describes ways that graduate students can approach mentoring.

Erin Eggleston:

I worked with handful of undergraduates when I was a grad student in the research lab. And that was very different from my interactions with them as a teaching assistant for courses when I was in grad school. And so I think there're two different pictures, but they're related in my mind. So giving students in a lab the opportunity to learn new techniques, new skills, build their lab toolkit is helpful. And you're hoping that they're going to help progress your project or contribute meaningfully to your project. But having some flexibility in what they can be working on I think made the experiences more meaningful. For students that I hired to specifically just do a task, count cells under a microscope, I think they got something out of that experience, but not as much as the ones who had a little more flexibility in the types of techniques they were using or developing some of the questions. And so that as I progressed through grad school, I was able to be a better research mentor and figuring out how to help people have these authentic research experiences.

Erin Larson:

Being a graduate student is one position where we're exposed to new responsibilities as a mentor. Now, Becca discusses more strategies for approaching mentoring as a new faculty member or in another new position or career stage.

Becca Barnes:

You're probably already a mentor. So it's not something like secret sauce or a secret formula that makes you a good mentor because you probably are already providing mentorship to someone in your life. Mentorship doesn't have to be just like huge action or huge acts, and so if you want to be very deliberate about your mentoring, I would say set small goals and they should be goals that are tying to get to know your mentor as a whole person. Because you're probably already linked up for a reason that is pretty identifiable if you're a new faculty member. But if you are not someone who is comfortable getting to know your students in that way, then don't do it. That's actually totally fine, I don't expect everyone to have the same relationship with their students as I do.

Becca Barnes:

And you need to just understand your own boundaries, but just because someone doesn't share your intellectual interest or someone doesn't share your background doesn't mean that you can't be a resource for them. And I think that that's the key is... So students, I don't know, I get assigned first year advisees and so they probably have said somewhere on their application that they're interested in environmental science, but they've never met me, they didn't choose me, they haven't had a class with me. And I try to just listen to what they're saying and reflect it back. I was just acting as, I think of it as a card catalog to resources at Colorado College. Like, "Oh, you're interested in physics? Well, I'm not in the physics department, but I have a friend who's in the physics department and I can send that email." And I show them that it's really accessible.

Becca Barnes:

And so then hopefully they can be like, "Oh, I can just email that professor too and get that information for myself." And so it can be these really small [inaudible 00:14:30], like just calling the registrar's office for a student can solve so many problems. And does it matter that the student is... Why the student

hasn't gone to the registrar's office, not really. Because you can call them and the reality is you have more power, they answer faster. You may get the same exact answer as them, but the student is going to trust it coming from you more than the person that they don't know at the registrar's office. And that is providing them greater comfort and greater access to the system that they have just answered. And so I just think it's important to show those small acts of kindness. It's so easy to just be like, "Oh, here's the registrar's number do it yourself, or go to the registrar it's across the quad." But if I call them, the student then knows one, I care enough to make the phone call, and that the information is actually very readily available.

Erin Larson:

Your syllabus in your classroom can be a place where you can mentor students. Erin describes how she uses her syllabus to be approachable and strategies for encouraging students to come to office hours.

Erin Eggleston:

To the extent possible for classes, I outline in my syllabus my expectations for group dynamics and inclusivity in classroom and try to make it clear that everyone has space. We're holding space for everyone in class and that that is also true outside of class. And so in that way, trying to be approachable, but just because it's written doesn't mean everybody reads it or feels like that it could just be written on paper. And so I think by reaching out to students, whether it's at a point where there's been a quiz or an exam or just somebody who's missed class. And I don't know why did they sleep in, maybe, but maybe there's something else deeper than that and just sending check in emails to say, "Noticed you weren't here, hoping you're okay." And that's been enough to trigger some folks coming in and chatting in office hours about external things from class that are making it hard for them to be present.

Erin Eggleston:

And then I also think not everybody feels comfortable coming to office hours. And I'm okay with that because I have peer tutors like TA, undergrad TA style. And so I encourage them if they don't feel comfortable coming to me to reach out to peer tutors for the class and make other resources through the center for teaching, learning and research, there's a number of different peer tutor options. So if I'm not the sounding board as a mentor yet, that there are other resources available that they can perhaps feel more comfortable interacting with peers who've been in the course before, who have other expertise that might support them. So my goal is that I'm not too scary or I'm not too off putting, but I know that there is a huge power dynamic there. And so sometimes it's easier, at least initially to open up to a peer. And then if the peers are also encouraging students to come in with me, then I see more people come through and chat.

Erin Larson:

One of the trickiest parts of being a scientist is figuring out how to ask for help. Becca tells us how she encourages students to ask for the help they need.

Becca Barnes:

So I think that the lack of... It's like they don't know what to Google, and not that I'm Google, but they don't know. They're so paralyzed by not knowing the next step that they don't even know how to ask for help, not knowing that next step. And whether that's graduate applications, whether that's applying for REUs, whether that's doing research, all of these things. It's similar especially my students, they have

been very high achieving in humans for most of their lives and are sometimes a little bit paralyzed by the fact that they don't know what to do. And it's the first time that's happened for them and it's a nice privilege for that to be the first time that's happened to them, but it also just reminds you that you need to essentially just ask for help, it's okay.

Becca Barnes:

And I just try to say that to them. So I often say things like, "Let me know how I can be a resource for you." And I say it in that almost clinical, very sterile way, but it's mostly because I want them to understand that that's my job. It's not about whether they're my friends or what have you, because students of course see my research students and they see the relationships I have with them and they're like, "Well, I don't have that relationship with Becca." But that doesn't mean that I'm not willing to help them of course. And so trying to figure out how to break down that barrier because for other students, there's no barrier, they have no boundary problems, they ask for help all the time. And so even the perception between student groups can be really different. So I think that that's hard.

Erin Larson:

Sometimes mentors and mentees have very different interests. Erin outlines how she helps students who have career goals that are very different from her expertise.

Erin Eggleston:

So I don't pretend that I can be an expert in anybody who's interested in industry or NGO or these different careers that I have not entertained. I think there... So I am open as much as possible with mentees about that lack of knowledge in my path and to the best of my ability, it's like depending on the student and their interests. I can think about folks I know who have gone through and they transition from a master's into a different type of program or just right out of undergrad they had a different path. And so if I can make those connections, I'm happy to do that for students or point them towards those folks. And then I also just rely heavily at Middlebury on the Center for Careers and Internships, but other resources around campus whose explicit job is to match students with sometimes academic but also outside of academic track types of internships and rely on the alumni network that is ever expanding that can match students with broad interests across the board.

Erin Eggleston:

And then I also just... If I come up with examples of, I worked for a civil engineer after undergrad for two years and I had no engineering training. So just encouraging students to reach out to people they are interested in interacting with, to make contacts in those spheres. And that can be off putting, it's challenging to reach out to something that feels totally unfamiliar. But if they feel comfortable reaching out, that's a great mechanism too, but also to not feel gutted if they don't hear back from an email to some shot in the dark person. And that's when I really encourage them to reach out to other resources whose job it is to help pair them with those types of expertise in different areas outside of academic tracks.

Erin Larson:

In addition to admitting when we need to send students to other people to get the mentorship they need, Becca shares how we can model vulnerability to show students that it's okay to make mistakes.

Becca Barnes:

Yeah, and I think it's also for me doing math in front of students, it doesn't matter if it's a shame, I'm going to do it wrong more often than I'm going to do it right. I think I am capable math person, but putting on a board with a piece of chalk, I will make a mistake. And I think that it also relieves that pressure of being perfect in front of students. We don't know things all the time and we know that, but they don't know it. And I think that if you can, I don't know, it's not let your guard down, your ego. Let your ego be a little bit less, and we can just admit our flaws and be real people as opposed to whatever person you're trying to play as you're professing.

Erin Larson:

Similarly, as a mentor, we have to acknowledge our limitations. Erin discusses how she encourages students to take advantage of other resources.

Erin Eggleston:

As a mentor, I think part of my job at least is to know where my limitations are and then have done enough reading and chatted with enough folks when I'm still finding resources that exist, but to be able to point people to the proper resource or the resource that has more expertise where I don't have it.

Eric Moody:

Yeah, every campus has a lot of resources for their students. So just knowing what those are and being able to point students in the right place.

Erin Eggleston:

So I think part of it is definitely on my shoulders to know what the resources are that are available and to keep up with because they change somewhat regularly. Who the contact people are for that, and then also I feel like to a certain extent the students are responsible for knowing where to look a little bit. And so for advisees I tend to meet them or try to meet them about halfway or I'm like, "Okay, you do a little bit of leg work on this and then I'll figure out who the CCI or the Center for Careers and Internship person is that would be the best point person and then we'll go on from there."

Erin Eggleston:

But I think part of it is to encouraging students to feel comfortable navigating how to find resources and how to find support. Because in the absence of an academic setting, especially, there aren't always people there to point you in the right direction. So letting students, not flounder, but sit a little bit in the gray area and figure out where the best point person might be. I think that is also a skill set that's good to work on.

Erin Larson:

Becca has done a lot of work on creating and sharing mentoring resources and expanding mentoring networks. She shared some information on those programs with us.

Becca Barnes:

Yeah, so our undergraduate mentoring program that was funded through an IUSE grant, so that's improving undergraduate STEM education. We are in our last no cost extension year, and so we're submitting a proposal in December to really look at the scalability and sustainability of it nationally or the hope is to make it national because we've had really great results and I will... Without a doubt, the

reason I'm as embedded in that mentoring literature and all of these things is because I work with these amazing educational psychologists and folks from some evaluations teams that have given me so many resources as ways of thinking about this in a more formal way so that I can go to ed sessions and pick up all these things that we commonly do at conferences around our science, but we often don't go to the educational or outreach sessions.

Becca Barnes:

And think in the same way about being like, "Oh I could try that." And you can try it in a small way, it doesn't mean you need to start a national mentoring program. And I think it's made it easier for me to take those little tidbits and incorporate them into my life and my work. But I'm super excited about this submission and obviously we hope it gets funded but we're specifically thinking about how well we can develop a model that allows us to test a train the trainer things so that essentially for sure Sandra Clinton and I are not the only ones doing right because that's not sustainable. And then also thinking about the success or lack of success including men as mentors. So we've done everything around same gender mentoring and the results have been overwhelmingly positive.

Becca Barnes:

Students in our program are seven times more likely to stay in the sciences than folks who are not in our program, because we've been following cohorts of students through time and we see that that's in large part due to the fact that by being part of our program, there are a number of role models in their life has significantly increased. And so we see that there's a direct correlation between a desire to stay in the field and the number of women role models that these scientists who identify as women can name in their lives. So no role models, they report a 22% chance of staying in the sciences and if they have three or more, it's up to 77%. So it's just like my favorite graph to draw on a napkin, it's like the most amazing results and we just want to see how much we can propagate that.

Erin Larson:

Erin is part of a team running a blog that aims to create an online community for women in science. She explained more about this blog and it's background for us.

Becca Barnes:

Blog space is called Femina Sciscitator , I don't know, it's Latin so who knows how it's actually pronounced, but it's with a group of friends from grad school across a variety of science disciplines. Post 2016 election feeling a bit gloomy about being women and being women in science, we decided that one thing we could work on collectively together was building an online community, an online space to support women in science by sharing our experiences, by interviewing other folks and hearing about their experiences and just using writing to work through some of the challenges that we were processing. And so there've been a wide range of types of topics we've written about.

Erin Eggleston:

I had a not recent anymore, April a post about navigating, applying to undergraduate, primarily undergraduate institution type academic positions and now some of my friends are putting together posts on industry jobs and transition from academic institutions to an industry position and how to navigate that or some strategies for navigating that space. We've interviewed a variety of different folks in different disciplines that are outside of our own disciplines, but really the goal is trying to create this community for promoting women in science and just having a broad range of what is the science we're

doing that's great, but also what it means to have this community to support and uplift the awesome stuff that people are doing who identify as female and scientists.

Erin Larson:

Thank you for listening to this special Making Waves Episode on STEM Mentoring. We'll share links to helpful resources on the Society for Freshwater Science webpage. If there are other topics you want us to cover, feel free to get in touch with us.

Outro:

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