Episode 165: Sara Vojnovich

**KL:** Katie Linder

**SV**: Sara Vojnovich

**KL:** You’re listening to “Research in Action”: episode one hundred and 165.

[intro music]

# Segment 1:

**KL:** Welcome to “Research in Action,” a weekly podcast about topics and issues related to research in higher education featuring experts across a range of disciplines. I’m your host, Dr. Katie Linder, research director at Oregon State University Ecampus, a national leader in online education. Along with every episode, we post show notes with links to resources mentioned in the episode, a full transcript, and an instructor guide for incorporating the episode into your courses. Visit our website at ecampus.oregonstate.edu/podcast to find all of these resources.

**KL:** On this episode, I'm joined by Sarah Vojnovich, a Master's student in the Department of Biomedical Sciences at Oregon State University who carries out infection studies with a bacterium, called Vibrio coralliilyticus, that infects corals and causes tissue necrosis by the release of a toxin. Current studies are typically done on coral fragments taken from the natural environment, but in order to help reduce wild coral takes, Sarah's research looks at the use of using anemones as an alternative surrogate host species for future bacterial infection experiments.

Sarah also works as an Assistant for Academic Programs at the Hatfield Marine Science Center and helps coordinate undergrad classes and internships.

Thanks so much for joining me on the show today, Sarah.

**SV:** Thank you so much for having me, Katie – so great to be here!

**KL:** So I'm really excited to talk with you about your research on corals. This is not a topic that we've covered on the show before, and I'm wondering if you can just start by sharing a little bit about what this research is about and give us a little bit of context.

**SV:** Absolutely. Yeah, so I do research on a bacteria called Vibrio coralliilyticus, and basically it is a bacteria that gets into the corals and causes tissue necrosis—that’s a fancy way of us saying that basically it kind of dissolves from the inside out. And it kind of creates the coral into mush, and then from there the coral basically just dies, and so I'm looking at ways to reduce wild coral takes. So as scientists, when we do experiments on corals, we typically don't do use lot of coral agriculture fragments, we typically take them from the wild. And so the problem with that is, you know, we're trying to save corals but at the same time, you know, we take fragments from the wild soreducing while takes one of the ways we could do that is using an alternative host, a surrogate host.

So we don't do experiments on humans—we typically do primates or lab rats—so we're trying to see if we can use the Aiptasia anemones to do experiments on bacteria that in fact corals instead of maybe doing them instead of on corals directly. There will always be a little bit of experiments at have to be on corals directly just to ensure that what we're seeing with the experiments on the anemones are truly matching what we're seeing in the corals, but it's an alternative idea that we're really looking into recently.

**KL:** Okay. This is really interesting. So what led to your research in this particular area, how did you get started with it?

**SV:** So I pretty much like everyone else I've been fascinated with the oceans ever since I was a child and I have always loved marine biology since I was a little girl. My undergrad was biology, but I think what really rooted me and grounded to me into doing diseases with actually during my graduate career, which I'm still doing, I took a disease ecology class by Ann Jules and Breanna Beachler was the one—Beacher, excuse me—was the one who was teaching it at the time and it was disease ecology and basically, you just really learned a dynamic of how diseases can affect ecosystems and populations and that really rooted mean to idea of, “wow how one disease can change entire ecosystems or animal populations dramatically.” And from there I was just kind of like this spark inside me of like, “I love this. This is awesome. Let's learn more about what this vibrio is.”

**KL:** Okay. So I feel like our audience may be somewhat familiar with kind of the current state of coral in the world, because it's kind of a thing, and people are definitely talking about it and I have expressed concern about it—there's documentaries, there's all kinds of things talking about it—but for people who may be less familiar, can you talk a little bit about like that bigger context of why coral is important kind of what role does it serve and why we care about it?

**SV:** Absolutely, so corals host about 25% of the world’s biodiversity, but they only surface wise cover probably one to two percent of the ocean surface. That is huge. That is a huge, kind of similar to like the Amazon rainforest. You have this huge diversity and area of organisms that are living together? And when you lose those corals your kind of like losing the trees and Amazon forest. You're losing that base foundation structure that’s holding up a lot of that ecosystem and you have the potential to lose a lot of those organisms in a large populations of the ocean when you lose that foundation structure. And this is really important. As we're seeing the effects of the coral bleaching and the coral dying—and especially with the Great Barrier Reef right now—at a faster and faster rate each year. Don't quote me on this, but I'm pretty sure it's around 50% of the corals are either experiencing bleaching, or have already bleached as of right now. And for scientists, that's kind of a huge red flag for us right now. That's pretty scary to know that, you know, 50% of this one population ecosystem could potentially be dying, and it's not just one species that’s dying is not just an animal it disappeared from ecosystem. It's an entire ecosystem. A system that's in trouble. And I think that dynamic right there the fact that we are at risk for losing several species at the same time is what kind of creates that red alert. And that importance right now for us. And for everyone to understand, you know corals provide a lot of ecosystem services that they can be everything and anything from tourism to biological food, and for humans and organisms that are living there now. A lot of the time they also do produce and create a lot of the different chemicals we have in the oceans, a lot of organisms also rely on, and it's just there's a whole bunch of dynamics in there. And when we lose them, it is going to be dramatic. It's not just aesthetically. Biologically we're going to be hurting a bit.

**KL:** Okay, so it's a big deal [*laughs*]. Shorthand: It's a big deal. So thank you. That's, that's really helpful context. Sarah, can you talk with us a little bit about the kinds of research methods you're using to study this topic? You've mentioned a little bit about trying to replace corals with something else so that you can kind of be trying to test some things, but give us a little bit more detail about what this research looks like for you.

**SV:** Yeah, absolutely. So basically we take experiments that have already been published, and already been done on corals, and we're going to test them on an anemones. And that's the first hand way of seeing, “okay the experiments that we know work on corals, do they work on anemones?” And when we do that they are basically infection experiments. And what we're doing is we're taking the bacteria, we grow it up for a couple hours, and then we go ahead and—different concentrations—so different amounts of bacteria, we're going to put them on different and anemone groups, and kind of basically see, “okay who dies at what concentration?” You know, are these and anemones living with a low dose of bacteria? Are haft of the anemones possibly dead with medium dose of bacteria? And if you put a heavy dose of that bacteria on those and anemones do they all die? And what we call this is mortality rates. Basically, we're looking to see how many enemies are dead. And at what point was kind of the turning point where we saw, “okay this amount bacteria, it starts killing the anemones.” And so we basically just kind of want to compare that to corals and kind of see did it reflect the same? Do we see the same disease symptoms showing up? Do we see necrosis? Do we see bleaching? And are there similar? If we have enough similarity, and we're able to use them as an alternative host, great, because then we can use them in the labs more often and they're easy to reproduce, easy to clone easy for access and everything, versus the coral.

**KL:** Okay, so I'm curious how frequently are you having to run this to know that it's like for sure? You know, like when you're testing this out on these on these anemones, and you're trying to figure out you know, like is are these rates the same? How many times do you running this to kind of get a definitive answer of “yes, we think we can count on this to be equivalent” to what the coral would be experiencing?

**SV:** So for us it would be a couple of times at least because you can always have some unusual and unique anemones that are super resilient or the immune system’s able to clear it. But we do it a couple of different times, and typically we run the experiments about a week at a time in adoration. And also it depends on the experiment has already published. So that experiment is already published on corals. Did they run the experiment for three weeks? For two weeks? For a week? So you would do it based on what that infection experiment already asked for and their protocol and you would go ahead and follow that. And so if you did it for like a week duration, and they had, let's say you had 10 anemones—or 10 corals, excuse me—and seven of them died, when you looked at your anemones after you, you had 10 anemones and after a week, you know did seven of them die? You want to be able to compare the results and see did you get the results of what the coral people said and what you're actually getting, and it may take a couple of times to get there.

It also depends on size. Sometimes anemones are bigger and smaller depends on if the coral, some bacteria are coral specific and host specific. But overall you're going to see some mortality anyway in the anemones to just it just it can be variable and it can take a couple of times to get there. It's not a one-time chance where you just throw it up, works magic, that's not science. Right?

**KL:** Right.

**SV:** So Edison said, you know, “I found 99 ways to not make a lightbulb.” So it's definitely trial and error and there a couple of times we have to do it, but. It's worth it.

**KL:** Okay. So what have you learned so far from this research? I mean are you seeing that the majority of these anemones are kind of aligning with what you're seeing in the corals or are there like very particular ones that are working and others that are not what are some of the things you're figuring out?

**SV:** So, stay tuned; we're still analyzing and looking at the data the anemones tend to be pretty resilient. So they may reflect some of what the coral experiments on might actually be better to do experiments on corals since corals tend to be pretty sensitive. Aiptasia anemones are pretty resilient. They are basically the pest of the aquarium industry world, and they can live in very intense conditions. So doing some of these experiments are definitely that debate coming up of “Okay, are they more resilient than the corals and themselves and should they be used as an alternative host?” I mean there are way other things that you can also do with Aiptasia. There are a lot of other types of experiments that are being done with them. You don't have to do just corals. But right now we're seeing that they are resilient. They are dying. Maybe not at the levels that the corals are, we're still looking at the data and trying to compare. I don't want to give results on way too quickly, but we are seeing comparable results so far.

**KL:** Okay, but this is such an interesting area of your research. We're going to take a brief break when we come back, we'll hear a little bit more from Sarah about her work with Marine Science Outreach education. Back in a moment.

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# Segment 2:

**KL:** Sarah, I know you do quite a bit of work with Marine Science Outreach education, and I'm hoping you can tell us a little bit more about your involvement with this. What does this entail?

**SV:** Absolutely. So, Katie, I am an assistant for academic programs at the Hatfield Marine Science Center, which is an extended campus of OSU in Newport, Oregon, and it is a research institution out there. And we do so many things academic programs. We have classes year-round, and we especially during the summer, we have a ton of summer classes that are awesome. We also do internships. So Hatfield is unique in the sense that we have a lot of state and government agencies that are basically a collaboration—and living within and nearby in buildings of the Hatfield Community is what we call it. And we have things like NOAA, EPA, ODF&W, U.S. Fisheries and Wildlife, Sea Grant, a lot of awesome opportunities where collaboration can happen between government agencies and OSU researchers. And we even have internships where students can actually, like the NOAA Hollings, the EPA internships can actually do internships in these government agencies and create connections and do science right there within those buildings. And so another internship we have is REU, and that's also an opportunity where students will collaborate and work with government agencies a lot.

The last component, of course, is research. We do a lot of awesome research and that may be within government agencies themselves, with different collaboration communities that we have nearby, and then also through OSU.

**KL:** Okay. So what are kind of some of the primary goals of that outreach education that you're doing through this Marine Science Center? And also just to kind of give people a sense of this like when people come to Hatfield there is like a public area where they can come in and like visit a museum, and like engage with research that we're doing at OSU, and it's very kind of public-facing. And so I'm sure that some of the outreach is happening there as well in addition to the things that we're doing with our students and with these other organizations, but can you talk about the goals of this? What are we trying to do in terms of kind of helping people to understand Hatfield Marine Science Center and just marine science in general?

**SV:** Yeah, absolutely. So one of the major, major goals I would say of Hatfield is basically to educate the community, and everyone that we can about marine science. And to kind of reach and realize that you know oceans touch everyone. It is two-thirds of our planet. It doesn't matter what background you come from, where you're at or what country you come from, oceans will somehow impact you at some point in your life. And to be able to create that collaboration and that idea that together we want to educate everyone we can about marine science and we do it, an awesome way of doing that to the visitor center and that's the kind of the museum that you referring to before. So the visitor center, our most dynamic area of the visitor center, of course, is going to be the octopus tank where we have an octopus, and you can see feedings, and you can view the octopus and kind of watch its behavior, and that's an awesome draw to get people in there to also wander around the other exhibits.

So all the other exhibits we have and the visitor center are geared towards experiments or research that is happening within the Hatfield community. So this can be anything from sound pollution, with oceanographic studies, it can be Marine Mammal Institute looking at different animals and their acoustics and the different callings in the ocean. It can be with fisheries, and can be with aquaculture with oyster farm beds, and things like that. So basically we're using interactive ways of engaging students and engaging people of all different sizes and groups and orientations to be able to understand what the oceans are about, to educate themselves, and basically to create citizen science and to create citizens of the world to be literate about oceans.

**KL:** So one of the most fascinating things I learned about when I first came here to OSU and I went to visit the Hatfield Marine Science Center, was that there is research going on within the center itself because it is serving the public, and so some of the research is happening through like video recognition of people who are there, and like some really amazing projects…

**SV:** Yes!

**KL:** Very experimental. Can you talk a little bit about that? Is that something that you're kind of aware of or that maybe not involved in but can you share a little bit about some of the things that are going on there as well?

**SV:** Absolutely. So what you're referring to are some projects and some study done by Shawn Roe, and what he's looking at is experiential learning, and basically we have cameras around the Hatfield Marine Visitor Science Center that are kind of interacting and kind of picking up how people learn. So people learn it all different dynamic ways. Do they learn by reading the signs and reading the text, you know we have? Do they learn by touching and picking up things and playing with stuff? So like a tsunami exhibit where you can like build a little miniature village and watch the wave knock it down. Do you learn by talking? How about interacting with our volunteers and learning about the touch tank in the pools and starfish? So do you learn verbally? And basically having that ability to view how people learn and in different dynamic situations were able to create better exhibits to reach people and different ways to be able to allow a more openness to, “oh you have this type of method of learning” maybe we should accommodate that. You know, do we need more volunteers verbally, do we need more interactive studies for students to play with? We have a giant sandbox and basically a projects down typography and by moving the sand you can basically create like little rivers and little valleys and mountains and things for you to play with and interact with. Or do you want to read do you want to see and hear the information? Do you want to watch a video? And so by having all of those different features available to the public, we're reaching out and expanding and touching all those different dynamic ways that people are learning, and therefore we can reach people better in a better way than just just an average way of, we're opening our doors and ability to basically reach across different backgrounds and people from all different areas and all different learning styles.

**KL:** Mm-hm. So I can also say to for people who might be a little concerned about this, there is no way you could walk into this building without knowing you're being videotaped. There are signs everywhere. They are large and they are very clear telling you that you have this in the you're walking into this and that you are being videoed, but it's such a fascinating part of the research as well. And I love how it's kind of a meta kind of research about what's going on in terms of people's experience of that space.

Sarah, I'm curious if you can talk about the role that you're playing in your in your involvement with this outreach education.

**SV:** Yeah, absolutely. So as an assistant, you know, we have we wear many hats, I would I do several different things and this can range from, you know, helping interns with their statistics and looking at their computers and their data, all the way to setting up classrooms.

We have visiting classrooms and or visiting classes for the classrooms and setting up and kind of getting the equipment and tools together. So it's a pretty dynamic. We can be a support to the professors and to the researchers and anything they may need, but also the students so with our interns, we basically hold their hand a lot of time during the summer when we do internships and we work very closely with them. And basically the purpose of that is to initiate a critical thinking and to really make them see that why they're doing what they're doing, but also to become about of answers that we want them to have on their own—asking questions, pulling answers out of them slowly for them to truly understand what they're doing and why, and I think more broadly about the subject that is not just a couple of data points on a graph but what is this graph represent?

What could it lead to, and what further research, and what limitations do we have within the studies that we have done? And so teaching students that is not always the easiest to do, as professors will tell you, but it's a very rewarding ability to do and so working with the students whether they be in classes or internships or doing research there as a volunteer, it's a unique opportunity to be able to see that reward and them and the see them glow and get really excited and passionate about something that we love that we want them to be excited about as well.

**KL:** Very cool. Okay. What have you learned through participating in this outreach education? It sounds like such a cool thing to be doing, so many different creative ways to be involved in it, what are you taking away from it so far?

**SV:** Absolutely, so many things so many skills, and public speaking for one. So a lot of us a lot of times we will do tours. So definitely hit me up later for tours of the Hatfield Marine Science Center. We kind of do behind-the-scenes tours like what you would do if you took a class there, what would the environment be like, where would you live? So the ability to give tours. The ability to convey jargon-heavy, scientific information to a community that is a broad audience that is also palatable. So bite-size pieces, ideas to take of what the research and science were doing, but make it for anyone on the street understand. If you popped into an elevator with someone for 30 seconds and they're like, “hey explain to me about the oceanographic gliders out there.” And be like, “yep, it's acoustics, we're recording information to kind of see what's happening out in the ocean. What are we hear? What do we see?” You know be able to take ideas and dynamic and complex situations and make them palatable so that away, People can take away information that they know and feel, you know, literate in the oceans and feel as a citizen scientist themselves that they can have an impact and understand what we're doing and why we’re doing it, and when we have society as a common whole understanding more of what these scientists are doing and the reasoning behind it, you know, that's a skill to be able to educate and to show citizens of science, you know what they're doing, and how we're doing it and why, why they should care. We're going to have more power more knowledge and more understanding about what we're doing and why we should care for the environment around us. And I think this one that major disconnects we have between scientific community and the broader audience as society is we are not properly a scientist engaging and making these hard scientific concepts palatable for you know average society, which it should be because we're going to get more support, and you know if we know it why shouldn't you.

**KL:** Okay, I love it. So we're going to take another brief break. When we come back, we're going to hear from Sarah about an upcoming research trip that she's taking back in a moment.

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# Segment 3:

**KL:** Sarah, I am really excited to hear about this upcoming research trip that you have. Can you tell us a little bit about?

**SV:** Awesome. Yeah for sure. So this is one unique opportunities and things that Hatfield has to offer is basically taking volunteer scientists out on research NOAA vessels. So NOAA it is the National Oceanic and Atmospheric Association, and they are headquarters for their marine ship operations here in Newport, Oregon. They have 16 vessels that run up and down the Pacific coastline of here and they are headquartered and monitored here through Newport, Oregon. And so awesome opportunity for us to have that here right in our backyard.

And so basically you go out on a ship. So the ship that I'm going on is called the Bell Shimada, and it is a 250-foot research vessel where we are going to be doing what's called a pre-recruitment survey. It's a fancy way of saying we're going to go out, we're going to do some trawling and we're basically going to see what we get. And this is able for us to see the general forage and basically look at the ocean health and ecosystem and kind of see what's out there. How many are there? And how they're doing. So basically the ecology distribution of the different organisms that are in that environment and it kind of gives us an assessment to be able to predict and see you know, how are these animals, even if it's a fishery because we are looking at juvenile salmon coming up, how are they going to be doing in the future? So kind of a predictor survey for us.

**KL:** Okay, so I'm really curious, I mean, this is an area that I think OSU is relatively well known for, and we've actually recently gotten some grants to build research vessels, which just kind of blows my mind in terms of what that even entails. Can you tell us a little bit about that context and kind of the broader scope of what OSU is doing with some of these research vessels?

**SV:** Awesome. Yeah, for sure. So NSF is able to allow us to have this 330 million dollar grant to build three research vessels. So the first one that I know of is actually built and finished and it is named, and then the second one and third one are—so second one I think it's being built—and I think the third one is in progress right now. Don't quote me on that. I would check the NOAA websites to know for sure. Excuse me, the NSF websites. But basically they are state-of-the-art. They're going to say OSU and have our little beaver logo on them, but they are going to be able to have new technologies and the built of them are going to be unique and some of the top-of-the-line ones for OSU and for researchers to be able to use A-line frames, and different technologies will allow us to do our research better and more effectively.

**KL:** This is so exciting. So when I want to get back to kind of this trip, you're taking though when you're on this boat or ship. It's 250 feet long. You can tell I don't know very much about this. You know, I don't even have a sense of how much 250 feet is. Like are you staying on this ship? Like, is there overnight cabins there? Can you give us a sense for people who are trying to imagine what this looks like? What kind of a ship are we talking?

**SV:** Yeah, for sure. So that's pretty large. So you actually do stay on there. There are bunks and there are different levels. At the top of the level, you're going to have your officers that are actually driving the boat so the NOAA officer core. Down below you're going to have your what we call staterooms and basically they're a bunch of rooms with little bunks in them that you're going to stay with other researchers or scientists, so they put us together. And then of course there are people, the NOAA people, who the officers who actually live on the boats and they have their own personal rooms as well. So basically it's like replicating a little miniature island out on the ocean, and this becomes your home you eat there you sleep there you do research there and you rest and repeat all day.

The shift that I'll be on is I'm going from noon to midnight, so we're trawling all the time, bringing stuff up looking at it. What is it, sample it, we have researchers that are sampling, we have people that are looking at equipment. To run these NOAA boats, you have a whole team. We have engineers and officers. We have scientists. We have welders, all different types of people and to be able to run and make these missions, you know go and it's awesome that we have this awesome team that we were able to work with together to make that happen.

The ships are pretty, pretty large. If you've ever seen them across the bay from the bay front in Newport this giant ships, that's directly what you're looking at. Yeah, they are pretty immense. It takes some getting used to be able to wrap your mind around how big they are. But once you're there, you kind of become accustomed to it being out on the deck being in the back.

And you also get used to the sea sickness that happens within the first couple of days, and you get used to the motion of the ocean and the motion of the movement and everything and equipment and how things run, but it's an adventure for sure.

That's so cool. Sarah. Can you talk a little bit about the equipment that is on board a ship like this where you mentioned, you know, you're pulling things up, you're looking at them you're doing some analysis in the field and trying to kind of answer some questions. Is this something that is setup is like a lab on the ship? Are there things that you're taking with you that are kind of mobile where you're just like testing things in the field? What are some of the kinds of things the equipment that's coming along with you for a trip like this?

**SV:** Awesome. Absolutely. Yes, we actually did. We do have labs actually on the boat itself. So the labs that would replicate the kind of look like a fume hood where you have like a metal table inside and you kind of have like the window that you would pull down. So basically looks like an normal laboratory fume hood inside. And then we have tables for sorting areas. We also have the outdoor equipment with the cranes to be able to pull equipment in and out.

So for those of you that may be more familiar with Plankton samples, we have Manta Nets and Bongo now, And so basically to dumb those down, the reason I called a manta net and it is because it literally looks like a manta ray we have two buoys on each side of it the kind of balance it and then you have a large mesh kind of in the middle and this mesh, sometimes they come in different sizes—like with the Bongo one—we can do two different mesh sizes same time, but this mesh basically it's like a filter, so it's kind of like your coffee filter where you put the water through but the coffee grinds supposedly aren't really going to end up your coffee. So it's like a filter that allows us to catch all the yucky stuff, the bigger items and all we want is the itty-bitty little guys, those little plankton that are microscopic. And that catches in the water and that goes through a cone shape net and all the way the bottom of that net—we call it the cod end—is going to be like a bottle. So imagine a plastic bottle maybe the size of like a Jiffy peanut butter bottle. And so that bottle would be able to catch all the organisms in there and then you screw it off the top of it off the net so the net releases it comes off of the plastic bottle and then what's inside, you're basically going to sort through different filters, the different sizes and basically taking microscope slides, unless you have scopes that are on the ship deck to be able to see what kind of organisms are in this water. What kind of juvenile baby species? Are looking at baby fishies? Or we're looking at baby crabs? Maybe baby oysters, and we'll call all those juveniles small stages plankton—either zooplankton or phytoplankton—so we're going to be able to look at that.

Some of the other equipment like The Bongo not in mentioned is basically if you imagine like two giant, hula hoops next to each other and I have like a screen door mesh on each of those hula hoops, but imagine that meshes different sizes one's a little bit smaller, a little bit finer and the other one's a little bit bigger. So that allows us to catch creatures of different sizes and the same thing they'll have like a cone shape net that's attached to it, and I'll go back to what we call the cod end with that plastic bottle, and then I'll allow us to kind of catch things a different sizes and that'll hook onto the side of the ship and will basically drag that along and kind of see what different organisms at what different depths of the ocean are present there.

**KL:** Okay, I mean what our listeners unfortunately cannot see, but maybe you can imagine is Sarah's making these incredible hand gestures to explain this to me as she's talking and making these very passionate facial expressions, which tell me that she's an excellent educator, which she's working with the general public to share these things. So I apologize for our listeners that you're not able to get the full experience that I am getting but it's so helpful.

So Sarah, how frequently are you going on these trips? Is this something that's pretty rare for you or you able to go out relatively frequently? What does that look like for you?

**SV:** So this is the first time I've actually personally been on one, but if you do things like REU internships, we actually typically almost every summer actually will sign an REU out on one of the ships in some of the labs that they are studying with in doing a project, and they'll go out for a week or maybe 10 days out on a ship trip and they'll look at Plankton and take maybe photos of the different organisms and things that they're looking at. And so it's not uncommon to have volunteer scientists, like interns are graduate students on these NOAA research vessels going out together. And that's that's a unique relationship that Hatfield has tried really hard to foster and to collaborate with and to work with is to have these opportunities of things like graduate students, undergrads, volunteers and internship people to be able to work together to be able to have those unique options and opportunities on these boats.

**KL:** So Sarah since this is your first ship trip that you're taking. What are you most looking forward to about it?

**SV:** Oh my gosh, the views! It should be gorgeous out there. If you've ever been out on a boat or ship, you know, the gorgeous, you know the ocean to seems to go forever and the sky kind of melts into it, but when you're out there and you see nothing but ocean for a long time, it cut ever looks a little bit like a desert because there's like nothing out there—there's not cacti though—but it's just so beautiful. And so peaceful to kind of see that landscape and that water and that sky just stretching forever and it's very peaceful. It kind of takes you into a unique environment where you disconnect from that technology you kind of disconnect from the busyness of email and everyday life and kind of just able to take in nature and one of its purest forms just being out in it. I'm definitely looking forward to that and looking forward to all the adventures. It probably will be pretty long hours, but I'm up for it because I love the exciting things that were able to find. A lot of unique organisms possibly and just kind of meeting new people and being around a new environment.

**KL:** That sounds so great. Well, Sarah, I want to thank you so much for coming on the show sharing about your work. This has been so interesting to hear about and I really appreciate you taking the time.

**SV:** Well, thank you so much Katie. It's been awesome.

**KL:** Thanks also to our listeners for joining us for this week's episode of research and action. I'm Katie Linder and we'll be back next week with a new episode.

Show notes with links to resources mentioned in the episode, a full transcript, and an instructor guide for incorporating the episode into your courses, can be found at the show’s website at [ecampus.oregonstate.edu/podcast](http://www.ecampus.oregonstate.edu/podcast).

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