

## Ocean Gazing: Episode 37

### *A field of green*

*Margaret McManus: University of Hawaii at Manoa*

<fade up intro music>

**Ari:** This is Ocean Gazing, the podcast where we duck below the ocean's surface and look all around us. I'm Ari Daniel Shapiro.

**McManus:** I definitely love my job. And the pursuit of trying to understand how the natural system works is just fascinating. It's just what our team has a passion for.

**Ari:** Margaret McManus is an associate professor at the University of Hawaii at Manoa. I caught up with her moments before she cast off the western coast of Oahu for a research cruise. These trips involve a lot of work, but it's an incredible chance to get immersed in a swirling natural world. Stay tuned.

<fade up intro music to full and sustain>

**Ari:** What makes Hawaii a good place, a good home for your science?

**McManus:** I almost think of Hawaii as – you're almost, like, living on an oceanographic station all the time. We're surrounded by water in every direction. No matter where you drive, you can be to the ocean within an hour on any side. Also, the shelf is very narrow so you can reach deep water very quickly. Plus, the weather's good pretty much year round so you don't have to wait for bad weather to pass before you can get back in the field.

**Ari:** Turns out McManus' research here in Hawaii is due to some work she did in the Gulf of Mexico.

**McManus:** Well, you know, in 1994, I was doing some submarine – submersible diving – and in the sub we got down below the mixed layer, and...

**Ari:** That's the layer between the surface and some depth – in this case, 10 meters – where the water is well mixed because of currents and wind.

**McManus:** I looked out the porthole and I looked across what looked to be a field of, of green. And very quickly we popped below that field. And I, I asked the sub crew what it was and nobody knew.

**Ari:** After nearly 15 years, McManus has found out that this field of green, it's something called a thin layer filled with lots of plankton – tiny marine plants and animals – and even some viruses and bacteria. By thin, I mean ranging from as tall as a pencil to as high up as a basketball hoop. In the ocean, that's, like, nothing. But this layer – it's like a blanket of goodies – full of things that get eaten by all sorts of other creatures in the ocean.

**McManus:** That's a great analogy. It is like a blanket of a high concentration of organisms. They attract not only zooplankton, but higher level predators.

**Ari:** Predators like fish and dolphins. So these thin layers – which aren't just in the Gulf of Mexico, but all over the world, including off the coast of Hawaii – end up influencing a lot of ocean life. And McManus has to consider a bunch of other forces acting on these critters.

**McManus:** So if you're studying any biological organism, the first thing you do is take a step back and look at the physical environment. That includes not only the ocean, but what's happening in the atmosphere because you know the winds affect the ocean, what's happening on land. Once you have an idea of that physical context, it's then and only then that you can start thinking about how the biology is responding. It's important to understand all the connections because if you miss one, you might be missing the one component that drives the system.

**Ari:** I mean, nature's interconnected. It doesn't just kind of focus on one thing. All these critters live in an environment and they're either eating each other, being eaten, swimming past each other.

**McManus:** Yeah, that's exactly right. It *is* all interconnected.

**Ari:** Most of the time McManus isn't on the water. She's got a series of moorings that keep track of the currents, water temperature, and the life inside the thin layers. <fade up ukelele music> But every several months, McManus and her team head out to sea. On this particular morning, they're leaving from a dock where this ukulele's being strummed.

Can you kind of explain what it is you're gonna be doing?

**McManus:** Well, we're taking a 30-foot fishing boat from the southwest shore of Oahu. And we're gonna transit about an hour-and-a-half north. We have a suite of instruments to measure physical, chemical and biological properties of the water. The boat will be there for 24 hours. We have a crew change at 3:00 in the morning, so I'll be getting off at 3.

**Ari:** By the time 3 a.m. rolls around, I mean, you gotta be pretty beat. What's that like to kinda go out for a while and stay out?

**McManus:** Yeah, it's pretty rough on your physical body. So the work we're doing is pretty labor intensive. We're gonna be dropping a profiler every 3 minutes or 3 ½ minutes. So we run in shifts but we're constantly working. And not only the work, but you have to adjust to the way the ship moves and the wind conditions. So by the time 3:00 in the morning rolls around, I usually feel exhausted and you know, sometimes almost in a daze. You know, after you do something repetitive for that long. Really, the most dangerous thing that we do after getting off this boat is drive home. That's the time when everyone gets very tired. And then it takes a good day or day and a half to recover, especially your hands, which get very sore.

**Ari:** Do people get cranky at all?

**McManus:** No, not my guys. They're all really good-natured guys. Everyone is very tolerant of one another. I think everyone gets tired but it's all good at the end of the day.

<boat noise>

**Ari:** Here's some of that good-natured crew gearing up for the trip on the dock, speaking with reporter Adrienne LaFrance.

**LaFrance:** Tell me your name, if you would.

**Benoit-Bird:** Kelly Benoit-Bird. We're at the Ko'olina Marina getting ready to head out for a night of field research. This is a 29-foot sport fishing boat captained by Joe Rike who comes over to work with us, well, just about every year now for the last decade or so.

**Rike:** Well, actually, it's a 31-foot boat. <laughs> 29 in the waterline, but it's a locally built boat, fishing boat, built for Hawaii waters.

**LaFrance:** How about you? First, tell me your name.

**Whitney:** Uh, Jonathan Whitney. I'm a grad student just here to help and learn how all the instruments work. Yeah, I'm sure it'll be a lot of waiting but, you know, get a lot of good measurements and see what happens.

**LaFrance:** Talk about how this is as a work environment.

**Whitney:** Oh, it's incredible: to be able to get out, especially on the Waianae side. It's the prettiest side of the island, probably and yeah, to be able to spend that much time on the water and just be outside, it's great. <fade boat noise down>

**McManus:** You know, this is what we've all trained for for a long time. And then we spend months and months planning for these expeditions. You think of everything from how many batteries do you have to how strong is the mooring line to which boat are you gonna use. So there's a tremendous amount of planning that goes into it. When it comes down to this day, when you actually get to get on the boat and move away from the dock, it's like an adventure, I would say. If we're going out to look at something that no one has looked at before, it's just very exciting to think about what we might see. <fade up transition music>

**Ari:** Instead of a sonic stumper, here's a quick poll. What's your favorite episode of Ocean Gazing been? And why? Let me know by sending an email on our website: [oceangazing.org](http://oceangazing.org). You can also hear about Margaret McManus' favorite constellation, and find a link to her webpage. The results from the cruise aren't up yet, but you can learn about McManus' numerous research projects and expeditions. And if you want to hear more from Kelly Benoit-Bird, she's the subject of our fourth episode of Ocean Gazing. Find it at [oceangazing.org](http://oceangazing.org).

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