**Ocean Gazing: Episode 42**
***California's ocean***

<intro music>

**Ari**: This is Ocean Gazing. It's the podcast where we listen to the frothy sea lapping at our toes. I'm Ari Daniel Shapiro.

**Thomas**: Within the state of California, we actually have quite a sophisticated observation system.

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**Ari**: That's Julie Thomas, the Executive Director of the Southern California Coastal Ocean Observing System. In this episode, we travel up and down the California coast to meet several very different people who are using the state's ocean observing systems. And I'm also working on a video of this episode. So check our website oceangazing.org early next week to see everything you're about to hear.

Julie Thomas is gonna set the stage.

**Thomas**: Ocean observing is not just about collecting data 24/7. We realize that we can't just shelf that data, and not make it useful. So we do engage our communities to get these data out to the public in a meaningful way to make their lives easier, to make their decisions easier. For us, ocean observing is really trying to design an observational system that affects all facets of our life. And that can include human health, protection of property and looking at our ecosystems and our habitats, and deciding how we can preserve our oceans for the world in the future.

**Ari**: Okay, first up: Captains John Carlier and Rick Hurt. They're both San Francisco Bar Pilots.

**Carlier**: We board every ship that's over 300 gross tons including container ships, cruise ships, car ships, and oil tankers. So we board the ship 11 miles outside in the ocean. We climb a rope ladder up the side of the ship and we pretty much take over the conn of the vessel, pilot them across the sandbar into the port in the bay. It feels like parallel parking, basically. A good day driving a ship is when you don't ask the tugboats to help you nudge it into the dock, and you just do it yourself. The ships are, you know, 24/7, we never stop, day or night. They keep coming, so…

**Hurt**: But to do that during our storm season, that can be challenging.

**Carlier**: Between the shallowness of the water and the fact that you're getting into tight areas with a fair amount of wind.

**Hurt**: Well, there's a few different risks…

**Carlier**: I'd say the biggest I've probably been out there trying to get off a ship is, like, 25 to 30 foot swells…

**Hurt**: You know, dangers to a vessel would be not being able to navigate safely, not being able to steer, losing steerage…

**Carlier**: …with probably a 10-foot sea.

**Hurt**: …and being blown out of the channel and onto the shoals that surround the channel.

**Carlier**: I've gotten off in about 65 knots of wind. I think that's my top, but it's ugly.

**Ari**: The San Francisco bar pilots can avoid conditions that are even worse than ugly by using real-time information from wave buoys.

**Carlier**: Well, I think what's nice about having the buoys out there: I can go right online and I can see the exact height of the swell. I can see how the wind direction might be changing so I can get an idea of how a storm is passing. And maybe determine whether we're even gonna go out that night. If it gets to a certain size of the swell, we're gonna maybe close the bar and just say it's not safe anymore. So I think that the buoy really helps for that. You know, on a nasty winter day, I'm checking it a lot.

Before we had the buoys, it would usually be the last pilot that had crossed the bar would make a call back into the office and say, you know, maybe we need to think about closing this down till daylight. But now with the buoys, you could actually make that prediction based on, oh, go online, and go, "Well, you know what, it's gettin' too large. I think maybe this ship should stay at anchor until tomorrow."

**Hurt**: Well, and I think also that the buoy can help us confirm what the weather – what the predictions are. Predictions are predictions, and real-time information is better. You know, giving us the best information to maneuver the vessel to create the best possible chance to safely embark or disembark a vessel so that we can carry on our pilotage duties.

**Ari**: Next is Ben McCue from WiLDCOAST, a non-profit that works to conserve coastal and marine ecosystems and wildlife. The organization is based in Imperial Beach, California, only a few miles from the Mexico border. It's where McCue's standing at the moment, and where the Tijuana River flows into the Pacific.

**McCue**: The Tijuana River watershed is one of the biggest watersheds here in Southern California. And actually three quarters of it is not in Southern California at all; it's in Mexico. It's in Tijuana. The city of Tijuana is about 300 feet higher than the city of San Diego. And so the river flows north across the border, and eventually ends up off our beaches here.

There are a lot of people who don't have basic infrastructure – sewage collection and treatment – mostly living in Mexico. So when it rains, everything – from pathogens, hepatitis, polio virus to massive amounts of solid waste, trash, tires – is carried by the river

and makes its way off the coast here. During any one rain event in the Tijuana River, we can have upwards of 3 billion gallons a day of contaminated runoff coming out through the river mouth and affecting beach water quality.

Two-thirds of regular ocean users here in Imperial Beach have reported getting sick after going in the water. So it is quite a significant issue, and it's an issue that's beyond being just environmental issue. It's actually a public health threat. And so the Tijuana River is the cause of around 90% of all of the beach closures in San Diego county.

The ocean observing system is an excellent tool for us. It tracks the plume of the Tijuana River, so when it discharges off the beach, and it tracks where that plume is heading. And the lifeguards are able to check it in real-time and to close beaches pro-actively. And this is a huge deal because in the past, we had to take water samples and wait between 24 and 48 hours to get the results back. And essentially all we could tell the public was, you know, either you were or you weren't surfing in sewage yesterday. And from a public health perspective, that's simply inadequate.

So the ocean observing system is a great tool to be able to estimate where exactly the Tijuana River plume is impacting beach water quality. So I think the ocean observing also doesn't have borders. It can be used just as well in Tijuana as it can be used here in San Diego county.

**Ari**: And finally, Art Seavey, a partner with the Monterey Abalone Company. He's speaking from the wharf in Monterey where the company's based.

**Seavey**: We actually farm abalone in the ocean in cages. About 15-20 feet under the surface, we have about 200 cages full of abalone, which are marine snails. And we buy baby abalone from hatcheries and stock them in cages and then harvest seaweed to feed them. There's quite an investment of time and energy and labor in each of those abalone.

It was just about 3 years ago, we noticed a dark red tide appeared on the farm one afternoon. Turned out it covered 40 miles of coastline here. It was comprised of a certain type of dinoflagellate that has been known to cause fish and shellfish kills throughout the world. We started finding cage after cage of dead abalone, and over the next 3 weeks, lost about 12,000 abalone worth about $60,000. It was a big loss for our small business, represented about 3 months worth of sales.

Fortunately, we were able to contact members of the local scientific community, oceanographers to try to understand what the heck was happening. And so what we were able to do was basically cut the cages loose and drop them down to the bottom. And it was below most of the concentration of dinoflagellates so it alleviated a lot of the stress on the animals. And we're able to avoid further serious loss of our stock.

Since then, we've started using data from people who are doing phytoplankton tows, and measuring oceanographic conditions up and down the coast. We can tell what kinds of phytoplankton blooms might be coming our way, you know, with a little bit of advanced

warning. So that's one way that this ocean observing system is really helping us. And they're a very important component of the security for our business operations.

We're really at the mercy of Mother Nature. And any information that we can get to try to help us predict what's coming our way is extremely helpful. It's of such a great value to us to have this information, and to know that these people are available, you know, if we have a crisis, and we really appreciate it.

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**Ari**: Visit us online at oceangazing.org to hear about a great abalone recipe and a little bit more about what it's like to be a San Francisco bar pilot. You can also send in your questions for any of the people featured in this episode. And in a couple of days, check out this whole episode as a video. Oceangazing.org.

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