Ocean Gazing: Episode 23
Keeping watch on a changing ocean

Kate Larkin & Richard Lampitt: National Oceanography Centre

<begin music>

Ari: This is Ocean Gazing, the podcast where we can open our eyes wide underwater without getting stung by the saltwater. I'm Ari Daniel Shapiro. This time we're headed to the National Oceanography Centre in Southampton in the UK, about 80 miles southwest of London. All sorts of people work there.

Larkin: A huge range of young, aspiring scientists as well as, you know, the…

Lampitt: The old ones!

Larkin: Tenure track. <laughs>

Lampitt: Was that what you were about to say? The old ones! <laughs>

Ari: Kate Larkin and Richard Lampitt are both biogeochemists at the Centre. And they're coordinating a massive European effort to look at, listen to, and touch the global oceans. Stay tuned.

<fade up music and sustain until it ends>

Ari: Larkin and Lampitt like to eye the ocean. Basically, trying to –

Lampitt: – link together the processes that occur in the upper part of the water column to those in the mid part of the water column and then going right down to the seafloor.

Ari: And, says Richard Lampitt, all these parts of the water column, they're connected.

Lampitt: It is that surface zone which drives the whole system. So, if you have sunlight and you've got nutrients, this then produces new particles. These are the microscopic plants. They grow, and then some of these sink. It's a tremendous depth it has to fall through. And it does this, in fact, in only a few weeks. So these particles are actually sticking together into rather sticky, mucus sort of lumps.

They do supply the food necessary for those animals that live in the deeper part of the water column. But then when they settle on the seabed, they form this layer of material, this organic rich layer over that sediment surface. And the animals, which live there, come and eat it. And it's those sinking particles, which then enable the rest of the ecosystem to survive and to flourish.

Ari: To keep track of all these particles, it takes some pretty sophisticated equipment.

Lampitt: Well, in the surface water, we've got all sorts of sensors for looking at the concentration of these microscopic plants looking at the gases and the physics. <gradually fade out music> And then in the middle part of the water column, we've got particle collectors, which collect the material as it's settling down through the water. And then on the seabed, we've got cameras that look at that material as it arrives there, and how the animals that are walking about on that seabed, how they respond to that. So it's, it's really an integrated program.

Ari: These instruments run non-stop, they stay out at sea permanently and stream their data back to shore. In other words, they're ocean observatories.

Lampitt: Whereas in former times we would go out to the oceans and observe occasionally, now we have to go to the oceans and stay there. And that's what we're doing with these observatories.

Ari: Larkin and Lampitt are networking the scientists associated with nine European ocean observatories. And Kate Larkin loves being involved in the whole process.

Larkin: That's what makes it quite exciting from an idea on paper to getting the money to actually going to the field, seeing the ocean as it is, being there at sea and understanding the dynamics visually so you can see it yourself. And then actually coming back and getting the stream of data, which means something to you because you've been there, done it, deployed the sensors and then analyzing the science that comes out of it.

Ari: There are a few projects still in the earliest stages of this process. Here's one example.

Larkin: There's a huge drive at the moment to have an international tsunami network. And eventually, the plan is to have an operational network across the globe for tsunami warning.

Ari: Right, and the idea would be that the sensor network in the ocean would kind of send some sort of trigger, relay, an alert to cause an evacuation of some type?

Lampitt: Yes, that's absolutely right. One of the objectives will be to have what we call an operational network for early warning for tsunamis. I mean, a lot of the work that we're doing is really trying to understand the principles by it as to why slopes become unstable to collapse.

Ari: I mean, the work that you're doing is kind of – sometimes it relates rather directly to a human health or a human-related kind of issue, an economic issue, a survival issue. And then other times, there's kind of science looking more at an ocean system.

Lampitt: Well, actually, I disagree with making that strong distinction. I mean, to my mind, sure, one needs to make observations in order to protect human health and economics. But in order to make any sense of those observations, we have to have the good science behind it to have that understanding, cause otherwise you just make observations, which are, you really can't draw proper conclusions about it.

Ari: Right, sometimes this so-called academic science could actually end up being quite relevant to humans and vice versa. They're relevant to all sorts of different kinds of processes and people.

Lampitt: That's certainly the philosophy that I follow.

Larkin: And sometimes the science starts as a blue skies research idea or a prototype sensor that perhaps we don't see the societal relevance immediately. And then, it develops into something of direct societal relevance. So I think that it's completely interlinked between the science excellence backing up what then becomes a societal reason for the science.

Ari: Larkin and Lampitt are making their science relevant to the greater public as well. <fade up music from end of observatories video on EuroSITES website> Here's last week's sonic stumper. It's the music from the end of a popular video made by the European Ocean Observatory Network. Larkin's one of the narrators, and she describes the crucial reasons for using observatories to study our oceans.

Larkin as narrator: We know that our planet is changing, and that in part these changes are affected by what happens in the ocean. The atmosphere and oceans are interconnected and changes in the atmosphere have a large influence both on the global weather systems, but also on the ocean and this in turn influences the climate as a positive feedback system.

Ari: During our interview, Larkin explained that this is one of numerous outreach tools.

Larkin: Here in Southampton we have a UK national science week. <fade out video music> And every year we have an exhibit on the ocean observatories, and we do quizzes with the kids, and we design questions so they can learn more about the ocean observatories. And this is something that different partners across Europe are picking up now. So they all have a science week in their own country and they also have different aquaria that they can do exhibitions at.

Lampitt: Unless we engage with the public, and particularly the younger public, in an interesting and dynamic way, then we will find the young of today will become disinterested in the scientific endeavor, will become disinterested in the environment. And then when they become influential in society, then we find that science doesn't progress. So it's a really, sort of, rather more – in addition, there's a fundamental philosophical commitment that the young of today are going to be the decision makers of tomorrow and they need to be properly educated and enthused in this exciting area.

Ari: And if all goes well, the ocean might just attract a bunch more people to check it out. <transition music fades up>

Here's our new sonic stumper.

<cross-fade to sonic stumper>

Ari: Have a guess? Wanna hear how studying the whole water column can impact the herring fishery? Looking for the link to the video you heard here? Visit our website: oceangazing, all one word, dot org.

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<fade up outro music>