Laura Guertin:

In 2014, IODP Expedition 353 encountered an interesting situation. The scientific research vessel *JOIDES Resolution* arrived at India's exclusive economic zone, but the permission to drill in the Indian waters had not yet come through. The JR, along with the scientists and crew on board were at the door, but had to wait for the gates to open. My name is Laura Guertin and I served as an Onboard Outreach Officer on *JOIDES Resolution* for Expedition 390 for this episode of Tales From the Deep, I sat down with Priyank Jaiswal, who sailed on Expedition 353 and shared with me how onboard the JR everyone did everything they could to occupy themselves while waiting for the approval to drill the experience made him appreciate things that must happen behind the scenes to make drilling possible.

Priyank Jaiswal:

My name is Priyank Jaiswal. I'm a professor of geophysics at Oklahoma State University.

Laura Guertin:

And what are we going to be talking about today?

Priyank Jaiswal:

I failed as a physical property scientist in Expedition 353. I'm here excited to share my experience, sing how we spend our time in 353.

Laura Guertin:

Okay, so let's go ahead and start from the beginning then. So Expedition 353. What were the science objectives? Where were you going? Let's set the stage here.

Priyank Jaiswal:

So Expedition 353 wanted to test the South Asian monsoon phenomenon. The premise was that prior drilling has been done between five degrees narc and nine degrees narc latitude, but nothing northwards of that. We are talking 2014, which is actually, so if you go north of nine degrees north latitude, that's when you get into the core monsoon area. So it hadn't been drilled up to that point, and that was the intent of expedition 353. Let's capture the monsoon signals. Let's go close to some of the main deltas on the East Coast, mainly the deltas from River Mahanadi and Krishna Godavari and examine the salinity signals. And then let's go way back to East 90 degree ridge and drill a site for reference, because we know that that sort of scene, that's away from any influence of monsoon. So the idea was to get one reference site and then two or three as many as we could basically along the Indian margin to capture the runoff, capture the mixing from salinity, and basically see what were the changes that we were observing over time. Now the expedition had a Pliocene and Pleistocene objective where we wanted to test how the monsoon has been changing in the recent times, but also we had a deeper time objective to see if there are any correlations between Himalayan and tectonics and the origin of the monsoon itself.

Laura Guertin:

So big objectives, that's for sure.

Priyank Jaiswal:

Yes, this was a very ambitious project and this was being done in a location that had never been drilled before, so obviously the participants were quite excited.

Laura Guertin:

And so what drew your interest to sail on this particular expedition? You mentioned you sailed as a physical properties specialist, but why Expedition 353?

Priyank Jaiswal:

I'm trained as a geophysicist, and my forte is processing and integrating data. Since the start of my career at OSU as an assistant professor, I have also been looking at the connection between particle arrangements and the nature of geophysical signals. Most of the rocks that I had dealt with up to Expedition 353 were from onshore petroliferous basins. These rocks often exhibited complex geophysical signals due to tectonic their tectonic history and presence of hydrocarbons in the fluid. So getting access to marine sediments was an exciting idea because marine sediments are generally better behaved, and in this case would be exactly at the level of consolidation where I can perform my experiments. So as a physical property scientist, I would also be able to compare a log response with the response of similar signals measured on the core. So that core to log comparison was a very exciting opportunity that I hadn't gotten so far in any basin.

To be a part of a drilling campaign was equally exciting. But the other reason why I was so interested was due to the geographical location. Up to that point, and again, we're talking 2014, I've been working on gas hydrates and the east coast of India has one of the best known gas hydrate deposits. Expedition 353 had nothing to do with gas hydrates. That was not its purpose, but at least I thought I would get a chance to look at the whole sediment. The sediments are actually holding gas hydrates in the vicinity. One of my research interests, whether it was gas hydrates or hydrocarbons or even the basic geophysical signals, was to see how the particle size distribution was affecting the porosity and permeability and the wave propagation. And I had proposed that I would be doing particle size analysis, and the co-chiefs got excited about it. So you see, there were so many things that came together for me with respect to this expedition, and that's why I sailed.

Laura Guertin:

So the location was exciting, what you were able to study, the chief scientists were excited, you were excited. So it just sounds like when it came time for the expedition to start, you must have been writing this momentum and ready to go. Let's talk about what happens next. Where did you depart from which port?

Priyank Jaiswal:

Yeah, so the expedition was to and from Singapore. And then let me give you a little background about this expedition to tell you what's coming next. So prior to the expedition, India had recently come on board the IODP movement and had become one of the paying members. The leadership in the country had changed recently, and so the country had really become this forward looking focused on science and innovation and so on. And so the ministries, the various ministries had significant interest in understanding the continental margin for resource development. So when this proposal came through the Indian bureaucracy, people liked it. People liked the idea that somebody would be actually cutting a core and we will be able to look at, and everyone, the entire community will be able to look at the sediments up close. In many ways, the proposal aligned with the interest of the scientific community as well as the long-term vision of India for her coastal development. Now, there were challenges from the get go. Let's put it this way because,

Laura Guertin:

Oh no, this does not sound good.

Priyank Jaiswal:

So you see up to that point, there hasn't, and this is to the best of my knowledge, there hadn't been any drilling in India's economic zone, such a deep drilling done by a foreign entity, done by an entity, which was actually not India, or not commissioned by India. While the idea was of interest to India, you can already see how conflicts would start arising, especially when the message is being transmitted from one department or one ministry to another. The process of getting the necessary permissions right from obtaining data that are required for approval of the site by ESCP was sort of becoming a challenge. So way back in June, Steve Clements was the co-chief, and we went to India. We were lucky enough to get our foot in the door, and the Director General of Hydrocarbons Office was open and willing to let us see because in principle everybody liked this proposal.

They realized the value of this proposal. It was just the mechanics of getting these data out and approved and into the hands of a foreign entity was a challenge. But again, the fact that they allowed us to look at the data says a lot about their intention. I mean, the government wanted this to happen, and the expedition went ahead. The preparations went ahead with the view that this will happen, that yes, it's a challenge to drill in. India's easy, but because things have been moving along, the permissions to drill in, India's easy would be there when the ship is at dock. So we started from Singapore, early mid-November I believe, and this wasn't a pretty smooth sail up to the 90 degree east site. It was in international waters, no problems getting there, no problems occupying the site. We wanted to, it was basically reoccupying the previous site, and I would say the first drilling was beautiful. It was very exciting. We were all geared up for the next site, and then we reached, as we were heading to the next site, the one close to Mahanadi Basin, we realized that the permissions are not there yet. And so at some point, the ship was standing in the middle of the ocean and we were not prepared for this.

Laura Guertin:

Let me do a quick recap here to make sure, because this story is amazing. In June, you went and visited and you had the discussions and everything looked very promising and was moving in the right directions. That's why ship preparation started and everyone boarded. And you left, you said in November.

Priyank Jaiswal:

Yes, in November.

Laura Guertin:

You got to your first site, which was outside the Exclusive Economic Zone, outside waters that are governed by India. So you were in international waters and you were able to collect your first set of materials, and then you move closer and all of a sudden you can't. What do you do? You're on a ship in the middle of the ocean still.

Priyank Jaiswal:

Yes, we hit a major roadblock. I mean, the permissions haven't come yet. And at that point, as you could imagine in the beginning, there was somewhat of a panic. I mean, this was a situation of crisis. We were losing time, which we thought would compromise the science objectives, and in some ways this was also somewhat demotivating, but we had no options but to wait. I mean, at the back of our minds, we knew that things are moving, but they're just not moving at the pace we would like to or necessary for this expedition to perform it day by day commitments. Let's put it this way. But here is what I would say before I tell you what we were doing, Expedition 353 had one of the most congenial group of scientists you could ever imagine. That crisis was sort of the first for everyone. But the team played along very well. The co-chiefs were somewhat dejected, and they repeated, I mean, naturally they repeated, they expressed their ness, and we brainstormed several times as to what can be done, but the ball was not in our core. But at the same time, I must say that nobody really lost hope, because again, we knew this could happen sooner or later. We just wanted it to happen.

Laura Guertin:

You're limited with how long you can be out there. There's only so much fuel on the ship. You only have two months overall for the entire expedition. And now you're at a stage where morale sounds like it's really low, but you're holding onto hope. So what else were you doing though? You weren't collecting core, you weren't looking at your physical properties, you didn't have any new materials. So what does one do when you're waiting for permission to come through?

Priyank Jaiswal:

Well, it was mostly wait and watch, let's put it this way. But instead of spending our time, ideally, most of us were either going over and beyond and familiarizing ourselves with the instruments or doing the literature search at some point to make the best use of the time. We actually went ahead and occupied the site that belonged to the following expedition. But let me make sure that this doesn't come across as something we did in desperation or at random. That site was originally part of this expeditions proposal, but in the review process, we were asked to let that site go and hand it over to the next expedition, which was a CPP. Basically, it was an expedition that was sponsored by the Indian government. So yes, it was not the most, I would say, encouraging environment, but that's when people get tested. I mean, we did not come prepared for that, but we were met with that challenge and we rose up to the challenge and we did whatever we could to occupy the time mindfully. We were actually also preparing. I mean, it was not just science. There was a lot of, not a lot of, but fit to the occasion. There was entertainment fit to the occasion as Christmas was nearing.

Laura Guertin:

So it was the end of the year. Sure.

Priyank Jaiswal:

End of the year. And then this was also a part of a team building process. We learned how toing the Christmas carols with the crew. So overall, it was a beautiful experience, although everyone was wishing let the permission come ASAP, and then shortly before everything shut down for Christmas, Santa came in with the good news, the Indian Navy was there, and they asked us to come to Visakhapatnam, which is one of the coastal towns. And then the Navy inspected *JOIDES Resolution*, and after that, everything is history. The expedition moved full speed ahead, and we got enough sediments to meet the science objectives. Everyone got to the best of my knowledge and understanding everyone got what they wanted so that they came together. At the end of the day, it came together beautifully.

Laura Guertin:

That is probably the best holiday gift you will ever get.

Priyank Jaiswal:

I know, right.

Laura Guertin:

How much time in total were you waiting? Was it a couple of weeks?

Priyank Jaiswal:

A couple of weeks, give or take.

Laura Guertin:

Even just to lose a couple of weeks. I imagine it felt very disruptive that you thought this would be your pattern, this would be your day-to-day activities, and then all of a sudden just had the brakes put on and you had to stop.

Priyank Jaiswal:

Yes, that is true. It's just that when you are not prepared for these things to happen and something like this happens, it really puts a big question mark. And at some point things seemed more uncertain than they actually were. Let's put it this way.

Laura Guertin:

It sounds like even though we would think that would be unfortunate that the permissions weren't there at the time you arrived at the site, that you were still able to find things to do scientifically as well as build your community among everyone on the ship. And from this experience, now that we're several years away from when it first happened, what do you feel you have taken away? What have you learned about what it takes to arrange and manage scientific ocean drilling expedition?

Priyank Jaiswal:

Yeah, great question. I mean, that expedition showed us so many things that we would otherwise have not known or learned about, and it only happened because we hit that roadblock. I mean, it made us appreciate what it takes to make such a drilling expedition happen. Such a scale of operation. It's typically JRSO, which is based out of Texas A&M, does all the leg work and the scientists on board hardly have to worry about the logistics or basically worry about how is it going to happen. They just need to focus on their science. I mean, the staff is well trained and they seasoned, and then the chefs are diligent and creative, and so all we have to do is to focus on science. But the weight and rise that occurred during the expedition told us how much has to go successfully behind the scenes for these expeditions to materialize.

Now, the story from the Indian side is equally complicated. I have a chance to mention this. So I'm taking this opportunity to show the story from the Indian side as well. I mean, a country like India, any large nation like India, it's bureaucracy is divided into a number of different departments that are often understaffed and overwhelmed with responsibilities to scientists on board. Getting the ship into the EEZ to drill months after it has been proved for drilling seems like a no-brainer. But if you take a step back and look at this particular event from the perspective of a larger bureaucracy, it's just one of the many files that are sitting on somebody's desk and all the files are equally important. Occasionally, maybe more than occasionally, departments have difficulty communicating their priorities and things slip through cracks. And this was exactly one of those things.

Now, the matter received a priority when the ship was actually right outside its destination. And I would say that the matter was escalated and the wheels started turning, and it pretty much, we went from zero to 60 in five seconds. And that's the thing, has never had, never happened before. I mean, never before. I would say that a drilling permission that was absolutely dormant, sitting there eating dust came to life and basically the drilling materialized. I mean, I would say kudos to the Indian group that worked behind the scenes tirelessly to make this happen, and kudos to Jamie Allen, who was the NSF program officer. He and many others who I would never know also were tirelessly on this end to make sure that it would not impact the relationship between the two countries. So a lot happened and that we will never know about how this finally materialized is a story that's hidden from most of the scientists. But we got glimpses of what was happening, and that at least gave me an understanding of how much has to happen, how many people have to join hands, and how many planets have to align for a thing, let's say in quotes, simple drilling to actually happen in a country's EEZ, let's put it this way. So yeah, this taught me a lot about not just science, but policy and operational misadventures.

Laura Guertin:

You bring up a great point where I think it's so easy for us to focus on our science, and especially when you're on the ship, because that is your physical environment. That's why you're out to sea is to do the work, but to make the work happen. There's all these other people involved behind the scenes that are multitasking and responsible for more than just this one ship drilling in this one location, as you said, this is something that is hard to wrap our heads around just how many offices and people and how much paperwork or how many emails need to go through, and who knows which office and which person has to give that final stamp of approval. How many layers and levels does it need to go through? But yeah, when you're in the moment, I'm sure on the ship that was the, Hey, we're here. Let's move this now.

Priyank Jaiswal:

Exactly, exactly. And then again, again, somebody somewhere took their responsibility on their shoulders that, Hey, we are going to approve them. We are going to let them drill into our EEZ, because I think, and here's the big boss saying, I think that will benefit the community and the country. In that long run, I will never know who that big boss is, but somebody somewhere stepped up and said, okay, we'll make this happen no matter what. Kudos to that guy or government.

Laura Guertin:

I think it's great insight into what we can learn about our own waters by working together, by having different nations come together, which have different technologies, access to different equipment, and by sharing the data, sharing the results, it benefits everyone. It benefits the global community.

Priyank Jaiswal:

Absolutely. I mean, isn't that the underlying premise of a program like IODP come together, work together, and let it benefit all.

Laura Guertin:

Now you're back on land. Here we are. We're now recording this in 2024. Have you been to sea since Expedition 353?

Priyank Jaiswal:

I have not, no.

Laura Guertin:

If you do get on a ship again in the future, mentally, will you approach it differently after this experience that you've just gone through? Do you think you'll prepare differently for the next time you might go on a ship?

Priyank Jaiswal:

Oh, absolutely. I mean, depends on the role, but either way, in whichever role I go, I guess I now have a more holistic view of these large scale operations. And the thing is, I didn't go back to the sea, but I have remained with IODP serving in their panels. Currently, I'm a member of the US Science Advisory Panel, and it's sort of out of admiration and respect for that community that I want to offer my services. It just takes so much for so many people to come together. Now, when I go to the sea, if I ever go again for drilling or even for a seismic acquisition or any kind of work, I'll probably carry more respect for people who I don't see on the ship, because I know that if it was not for them, the expedition would not have materialized.

Laura Guertin:

That's actually really wonderful, and I think so important for everyone to hear that message and to reflect upon that it's not just who you see, but it's also who you don't see that makes this happen. Is there anything else you want to share?

Priyank Jaiswal:

Well, one thing I would like to say in closing that the lessons carry over. So what I learned from sail an expedition 353, I've used so many times ever since because I've been part of land expeditions many times after that, 3D seismic surveys, drilling campaigns, I am now part of a carbon sequestration project where we are gearing up to do the same. I mean, the ultimate goal is to drill a well on shore and start injecting CO2, and maybe subconsciously, maybe because of Expedition 353, that when I'm approaching this, I'm lead PI of one of the grants. But when I'm approaching this future drilling project, I want to make sure that I have built ties with all different stakeholders, the state government, the public. I mean, it takes so many planets to align for something like this to come through. So I'll never forget if I three, not just because of the excitement, the rollercoaster ride, both literally and figuratively, but also because the lessons that I absorbed being in the ship and working with them.

Laura Guertin:

Thank you so much for sharing your powerful story today.

Priyank Jaiswal:

Thank you for this opportunity, Laura. I truly enjoyed talking about it.