Student 1: I liked how hands on looking at the sediments rather than looking at them in a book or it just, you could actually see it. I felt like I understood it more than just looking at it on the page.

Christina Barsi: Hi, I'm Christina Barsi.

Christina Barsi: And I'm Sun Ezzell and you're listening to the Magic Mountie podcast.

Christina Barsi: Our mission is to find ways to keep your ear to the ground, so to speak, by bringing to you the activities and events you may not have time to attend, the resources on campus you might want to know more about, the interesting things your colleagues are creating, and the many ways we can continue to better help and guide our students.

Christina Barsi: We bring to you the voices of Mount SAC, from the classroom to completion...

Student 2: I know I want to achieve my goals and I know people here are going to help me to do it.

Speaker 3: She is a sociology major and she's transferring to Cal-Poly Pomona. Psychology major. English major...

Christina Barsi: From transforming part time into full time,

Student 3: I really like the time that we spent with Julie about how to write a CV and a cover letter...

Christina Barsi: Or just finding time to soak in the campus.

Speaker 5: To think of the natural environment around us as a library.

Christina Barsi: We want to keep you informed and connected to all things Mount SAC, but most importantly we want to keep you connected with each other. I'm Christina Barsi, Mt. SAC alumni and producer of this podcast.

Christina Barsi: And Sun Ezzell, Learning Assistance faculty and Professional Learning Academy Coordinator.

Christina Barsi: And this is the Magic Mountie podcast.

Tania Anders: Hello, my name is Tania Anders. I'm a faculty member in the earth sciences and astronomy department, here at Mount SAC. In my department we take all of our students on field trips. It is on those trips that students get to apply their knowledge from the classroom to the real world and make connections that are easily missed, when learning exclusively from readings.

Tania Anders: Students see the bigger picture and on top of that we always have lots of fun. Field trips are a great way to break the ice with students. So many students shy away from visiting professors in their offices, but out in the field they ask question after question, both about the course material, but also simply to get to know the faculty member better. In my case, just about on every field trip I get asked about life in Germany, because that is where I grew up. After field trips, the atmosphere in the classroom is definitely different. We all feel more connected and students seem to be more relaxed. I mostly teach oceanography and therefore take my students to the coast. I usually offer two trips. One to the coast where the students study sediments, rocks, waves, tide pool organisms, among other things. The second one takes students out onto the Pacific, on a small research vessel, the RV Yellow fin. Well, let's dive in. Join me and my students on our first field trip adventure of the semester to Dana Point.

Tania Anders: We're on our bus, on the way to Dana point for our oceanography class field trip. I have a few students here who I'm going to be asking, while we're driving down there, what they're hoping to see at Dana Point, and I'm going to capture some student voices here. So let me ask you, how do you think maybe the field trip will teach you things differently than from being in the classroom?

Student 4: You can see it visually.

Tania Anders: Okay [crosstalk 00:03:13]. What are you hoping to see while we're out there?

Student 4: Lots of little guys in the tide pools.

Tania Anders: Tide pools are fun, right? What are you excited about?

Student 5: Just working with my classmates in an actual field study. So it all kinds of sticks in my brain better than like diagrams on a whiteboard.

Tania Anders: I love that. Yeah. And I love how you brought up teamwork too. It's so much easier. In the classroom, we try to do teamwork too, but it's going to be easier out in the field, right?

Student 6: I think it's going to be more interactive, because we actually get to see what we're studying, instead of just looking at a text book and imagining this is how it is. I think it's going to be interesting, because you get to focus more on what you're studying, because you're holding it, you're looking at it, you're actually interacting with it scientifically. So measuring it.

Tania Anders: So what are you excited about seeing, maybe?

Student 7: I'm excited to see... I really want to see a bristle star. I do. That one and whatever this one is. How do you say that?

Tania Anders: Chiton.

Student 7: Yeah chiton I want to see those too. [crosstalk 00:04:13]

Tania Anders: I'm going to try really hard to find some for you.

Tania Anders: Welcome to the coast, guys. Those of you that were sleeping, it's time to wake up. We're approaching Dana Point. I want to remind you also that as you get off the bus, I'm going to be handing you the invertebrate identification cards, as well as the Wentworth scale, which you will be using to help you describe the sediments. Big, big reminder, we are going to be in a Marine protected area, so you want to respect everything within that zone. We're about to have lots of fun, hopefully.

Tania Anders: All right, so here we are, out of the bus, fresh air. Hooray. Overcast. Even better, right? I'm sure this will be lots of fun. So it's really important for us to pay attention to the tide. What is tide anyway? So it's the daily rise and fall of the sea level and it has something to do with the sun and the moon pulling the water towards it. So we'll be studying that in class still, but today you already get to observe that. So high tide today was at around 7:50 this morning. So we're still at a bit higher tide. The low will be at 1:30 today. So that's why we're doing the Tide pool stop, which is the furthest out last, because we want to give the sea level a chance to lower.

Tania Anders: So I want you to really be observant while you're out in the field today. And so the first thing you can look for already, this little beach area here, they call that Baby Beach. So just observe, maybe even take a photo of where the water level is now and later at 1:30, when we come back to the bus, take a look again because then the water level should be lower.

Tania Anders: So we're going to start up here. The five main stops that we're going to be doing today is the Baby Beach area, where is where you get to use your hand lenses and your Wentworth scales, for the first time. You're going to describe the sediment. You're going to look at what is it maybe made of? Is it very uniform? Are the sizes all the same? What is the size? Use the proper terms from your scale. Again, you want to be working in teams today and then we're going to stop at the Breakwater, which you can see there behind you ready. And when we get there, you'll see how the water that's all around the Pacific, definitely not as calm as the one behind the Breakwater. So we're going to be going over there. And then the final stop will be the tide pools.

Tania Anders: Did you see any minerals that actually formed from water?

Student 8: Seashells, right? Is that what you mean?

Tania Anders: No, that would be biogenous.

Student 8: Okay.

Tania Anders: And did you see any shells?

Student 8: No I didn't.

Tania Anders: Okay, there's your exclusion. [crosstalk 00:07:13] it's not biogenous. So what would be an example of a hydrogenous sediment, something that actually precipitated or crystallized out of the water?

Student 9: The black smoker or, oh no, those are the evaporites?

Tania Anders: Exactly. evaporites, for example. So what, [crosstalk 00:07:28] it's like salt. Do we have salt here?

Student 9: We have quartz.

Tania Anders: We have quartz.

Student 9: Quartz come from the rocks on the land, right?

Tania Anders: So [crosstalk 00:07:37] yes [inaudible 00:07:39], awesome guys.

Tania Anders: All right. Well, welcome to the Pacific. There it is. The wind is picking up a little bit already. Right? Why is the wind important for us to study in oceanography? [crosstalk 00:07:54] The waves, exactly. So everybody turned to the ocean. Are you seeing waves? [crosstalk 00:08:01] Yes. Right, a little bit? So there's definitely waves. There's always waves, right? If you've ever, have you ever been to the coast where there were no waves crashing on the beach? Never, right? Have you ever been to the coast on a day where it was like basically no wind, really calm, where there's still waves? Why is that? Because waves are generated by wind. The wind is causing the waves.

Tania Anders: So today, obviously it's windy. We would expect to have waves, but if you came here on a really calm day, you would still have waves. Why is that? Is the Pacific pretty large? [crosstalk 00:08:40] Yes. Do you think maybe somewhere there's wind blowing a storm over the Pacific somewhere? Most definitely, right? And usually it's the major storm systems that really, really generate waves and it could be a storm system a hundred miles off shore and we would get the waves.

Tania Anders: You've all looked at sediment now at this point. Say you have sediments suspended in the water there and now all of a sudden you have real calm water. What is that sediment going to do? It'll settle down. It'll actually sink down because there's less energy, so it just seems to the bottom. So every now and then, I've actually been here when they were doing that. Every now and then they have to dredge out the sediment here again, because it just simply starts to pile up and then the boats can't get out anymore when the water is shallow. So whenever you build a dam or something like that, you're affecting the energy of the water and you often then get sediment piling up.

Tania Anders: Here we are at the tide pools. The tide pools are always everybody's favorite. Everybody likes to look at critters. It's a good idea to get up close. Just hover over one of those little pools and just watch it for a minute or two and you'll see hermit crabs moving around. You'll sea anemones opening up and closing. You may see some chiton, some barnacles.

Student 10: There's one right here.

Tania Anders: So what [crosstalk 00:10:06] did you find? Okay, so hermit crabs.

Student 10: Yeah.

Tania Anders: What else?

Student 11: Where are the crabs?

Student 10: These are hermit crabs. That's some kelp down there. Some kelp.

Tania Anders: Yeah, kelp? So be careful, it's algae. These are different types of algae.

Student 10: Oh.

Tania Anders: Because kelp is bigger. That's out there.

Student 10: Oh okay.

Tania Anders: Yeah.

Student 10: So I see...

Tania Anders: What are those things here that have all those shells on them?

Student 11: Yeah, they're bunched up.

Student 10: Muscles, or no, not muscles.

Tania Anders: All the ones that have the shell [crosstalk 00:10:33] fragments on them.

Student 10: Oh these.

Tania Anders: Yes. Those are sea anemones.

Student 10: Oh.

Tania Anders: And what I'm tasking you to do is to also find one that's maybe a little lower in the water and open.

Student 10: Oh, okay. Like this one right here.

Tania Anders: Why do you think those have all these shells [crosstalk 00:10:51] on them?

Student 10: This one's open.

Tania Anders: Yeah, there you go. Why do you think these have shells on them?

Student 11: What is that?

Student 10: To attract food?

Tania Anders: No, that could be, theoretically, an option.

Student 10: To [crosstalk 00:11:04] protect?

Tania Anders: Protect.

Student 10: Protect themselves.

Tania Anders: And protect against what?

Student 10: Oh, the fish [crosstalk 00:11:08].

Student 11: Predators.

Tania Anders: Predators and what else?

Student 10: The current?

Tania Anders: You're on the right track.

Student 10: Tide. Oh so the [crosstalk 00:11:15] tide won't pull them out. They'll be strong enough to stay-

Tania Anders: Well no, [crosstalk 00:11:19] you know they're actually really well attached, but what happens when the tide goes out? What goes out with the tide?

Student 10: Their food, or...

Tania Anders: Silly question, but what goes out-

Student 10: Water.

Tania Anders: -with the tide? The water, right? So what happens to these guys when there's no more water?

Student 10: They get dry. [crosstalk 00:11:35]

Tania Anders: Exactly. They will dry up. So they're kind of sticky. So they'll stick these shells on them and that keeps them from drying out.

Student 10: Wow, that's cool.

Student 11: That's cool.

Tania Anders: So we're heading back from our field trip and I want to capture a few impressions, I guess. So what are you taking back from the day?

Student 12: Not only did I have a blast, but it was awesome to see the different variations of the rocks, the cliffs, seeing the fault line and all the different marine life in the tide pools.

Tania Anders: That was fun, wasn't it? Awesome. So what would you say is something that you learned today that you feel like, wow, this was nicer to learn in the field, than in the classroom? Anything?

Student 12: I would say just how everything interacts with each other, from the waves to the life and, you know, the rocks and sediment and pretty much the way everything kind of interacts as one and just seeing it being there.

Tania Anders: I love that, right?

Student 12: Yeah.

Tania Anders: Because in a textbook, it's all the chapters, everything's separated. And here you kind of get the whole picture.

Student 12: Yeah, you're able to actually see it and you know, it's really cool to seeing actually in life.

Tania Anders: So I'm curious, what was the funnest thing today?

Student 13: Jumping and trying not to die on the rocks.

Tania Anders: Okay and what's the coolest thing you saw?

Student 13: The little hermit crabs in the tide pools were pretty cool.

Tania Anders: Cool.

Student 14: I think it was that big, black [crosstalk 00:13:04] slug.

Tania Anders: So what is something that you learned today that you thought this was cooler to learn in the field, rather than in the classroom?

Student 14: So one thing I noticed was possible evaporites, because we found possible salt formulations on the rocks. I actually got a little sample of it, like a little baggie I got, hopefully we could look under the microscope. Maybe.

Tania Anders: Oh yeah, we'll do that.

Student 14: It looked like a white, filmy, glass texture on it. If it is salt, that would be an excellent way to show evaporites [crosstalk 00:13:38] in action.

Student 1: We saw the lobster. That was pretty cool. He was pretty big, but unfortunately when everybody came, he ran away, but he was cool to see while he was there. I liked how, hands on looking at the sediments, rather than looking at them in a book or, it just, you could actually see it. I felt like I understood it more than just looking at it on the page.

Student 14: I really enjoyed being out in the field.

Student 17: Looking at different species up close.

Student 18: Personally looking at the sand with little microscopes. That would've been kind of hard to do in class.

Christina Barsi: A second field trip was captured at the Southern California Marine Institute. Join Tania and her class, as they go for a boat ride around the Pacific and learn even more about marine life. Here's Tania.

Tania Anders: Welcome to the Southern California Marine Institute, which is run by a couple of different campuses, a consortium. They have some research labs inside and some experiments going on outside. They're going to show that to us after the boat. They would like to take us on the boat first. We're going to have lots of fun. I hope you guys put on sunscreen.

Tania Anders: So we're down here on the coast. Have you guys ever been on a boat before?

Student 19: I haven't. I've never been on a boat.

Tania Anders: Are you nervous?

Student 19: Yeah, just a little bit.

Tania Anders: So I think we'll be fine. It'll be perfect. So what are you most excited about?

Student 19: I'm excited about the lecture. See, you know, what I can learn that's new.

Tania Anders: Awesome.

Student 19: Probably most excited about seeing what I can see out there, I mean probably, because I don't know what we'll be able to see.

Tania Anders: Are you hoping for dolphins?

Student 19: Maybe.

Tania Anders: I always hope for dolphins. [crosstalk 00:15:21]

Speaker 4: So the most common fish we see in this area is called a white croaker. Things I can kind of tell you about its morphology, its life history, [crosstalk 00:15:34] is this kind of stub nose and if you look at its mouth, it protrudes downwards, as opposed to something like a queen fish. So they're very similar looking fish. So what that tells you about its life history is this is eating a lot of the bottom, while this is eating more in the waterfall. Because they are [inaudible 00:15:52] on the benthic zone, you don't really want to be eating out of them because they have so many different types of toxins in them. We see, we call these target shrimp.

Student 20: Target shrimp?

Speaker 4: Yeah. So they're called target shrimp, because they have what looks like this bullseye on them, this target. Pretty good. You can eat these. What does someone think the purpose of those two blue marks are? What do those look like? [crosstalk 00:16:17] Eyeballs, right? So what will happen is when they feel like they're in defense, they'll actually do this, exactly. They'll become rigid and stick their fins out so that a predator thinks that these are it's eyes and engages the size of this off of eyes being that big. So the predator will think it's much bigger and much larger than it actually is, although it's still just a little shrimp.

Speaker 4: Another kind of fish we have here. It's called a fantail sole. So where do we think this fish lives? [crosstalk 00:16:46] On the bottom because of its flat shape, right? These fish are left to right sided fish. So meaning that when they're born, there's an eye on either side, but as they get older, the right eye migrates to the left side of the head. So there's two different types of flat fish families and they're kind of broken up by left side migrating or right side migrate.

Speaker 4: This is the purple urchin, which is shorter spines and a more purple color. They're actually really invasive and all throughout California, they've been cause of much debate because we used to have, say, like sea otters around Southern California, but increase in urchin population has eaten all of our macro systems, which is our giant kelp. So urchins will actually feed and eat all the kelp and kelp is really important, because it serves as a habitat for growing fish, for sea otters and provides a lot of food for a lot of the inverts. So without kelp, it's almost like a barren wasteland.

Speaker 4: We have three different tools that we use to measure water quality. The first of which is called a "Forel-Ule scale". What it is, is pretty much different chemical compounds like potassium bichlorate, sodium chlorate that kind of cause these different colors. Very simple to use. All you do is you hold it up to the water and you see what color it is. So what's it look like?

Student 21: It's got some green. So the one, this is like a light blue? One.

Speaker 4: One? Yeah, I'd say so too. So if we did this, when we do this inside the Harbor, the dock, we'll see a big difference. So this measures gross biological productivity. So the amount of vital plankton and actually biological activity that's going on in the water. So the more green, the more plankton you have, the more photosynthesis occurring.

Speaker 4: Second tool we use, this measures sunlight penetration and the availability of light at that point. So this is our last tool that we're going to use. It's called a Y S I. This is a little bit more high tech than the other two things we were using. So what it is, is pretty much there are different probes that use optics, so they shoot out little lasers and then the amount of particles that pass through, it allows us to give us readings of dissolved oxygen, solidity, temperature, conductivity, pH. So, dissolved oxygen comes from two places, [crosstalk 00:19:14] plankton and wind, aeration. Now why do we think dissolved oxygen is important?

Student 22: It's everything, we need oxygen to breathe.

Speaker 4: Exactly. So like on land, everything under water also needs oxygen to respire and breathe. So what we're going to do is we're going to give out readings. In order, it's going to be temperature, dissolved oxygen, salinity, pH and depth. Okay?

Student 23: So the temperature was 19 degrees Celsius. The uh...

Speaker 4: Dissolved oxygen.

Student 23: Dissolved oxygen was 8.40 and then the salinity was 33.71 and then the depth is 0.8 or, it's going up.

Tania Anders: All right. What was the coolest thing you saw today?

Student 24: Dolphin.

Tania Anders: Dolphin.

Student 25: The seals acting like sharks. Seals acting [crosstalk 00:20:12] like sharks. That was cool.

Student 26: Fossilized tar and fossilized bones.

Student 25: That was cool. What are some things you guys enjoyed?

Student 27: Seeing different kinds of fishes.

Student 28: Petrified tar.

Tania Anders: Yeah.

Student 29: Different organisms.

Student 30: How they measured salinity and the depth.

Student 31: That's the first time I've ever been on a boat like that. So I mean, I guess that aspect was pretty cool about it [crosstalk 00:20:33] and seeing all the different marine life out there. It was very cool learning about the fish and all that.

Tania Anders: I'm so glad you got to go on a boat today.

Student 31: Thank you.

Tania Anders: I'm so happy.

Christina Barsi: Thank you for listening to the Mountie podcast. Remember to subscribe on Apple podcasts, Spotify, or wherever you like to get your podcasts, so you can listen in the car, in your office, or however you like to listen. Once you subscribe, we'd love to hear what you think by leaving us a review. And don't forget to share your favorite episodes.