

Jennifer Stock: You're listening to Ocean Currents, a podcast brought to you by NOAA's Cordell Bank National Marine Sanctuary. This radio program was originally broadcast on KWMR in Point Reyes Station, California. Thanks for listening!

(Music)

Jennifer Stock: And welcome. You're listening to Ocean Currents. I am your host, Jennifer Stock. This is a show where we talk about the blue part of our planet, the ocean. We talk with scientists, experts, policymakers, explorers, and today, students and more and today we're talking with some students from the West Marin School out here in Point Reyes, California. These students have been participating in an in-depth exploration of the West Marin watershed, their home, that drains into the mighty Pacific Ocean. As Earth Day has rolled past again, this project is a great example of how the meaning of Earth Day can be an everyday part of our lives in education with some support and guidance.

So, in the studio here today, I have Madeline Hope who is one of the leaders of this program and Leslie Adler Ivanbrook, who is another leader and I have five students from the West Marin school that got out of class today to come down here to the KWMR studio. So, I want to welcome you all to KWMR, you're all live on the air.

Voices: Hi!

Jennifer Stock: Great to hear your voices. So, I wanted to start with Madeline and Leslie since you two are really the spearhead of this whole program. Tell us about it. What's the name of it and how did you get involved and start this whole program up?

Leslie Ivanbrook: Well, the name of the program is West Marin BWET, which stands for Bay Watershed Education and Training and we've coined it outdoor Ed in the watershed and we started this up because we saw that it would really be a wonderful experience for these kids in school here to get more hands on outdoor education in this amazing environment that we have here at West Marin and there are a lot of programs that happen at the school. They do have outdoor education in large part supported by the artists in the school program and we wanted to support that by infusing the school with additional energy and fun and resources to get these kids out doing hands on science and activities outside in the Bay, in the creeks, and at the ocean.

Jennifer Stock: Excellent. Now, this is a compliment to the artists in classrooms program because that's been going on for a couple of years where the students get outside and get to experiment with writing and drawing and kind of expressing their thoughts and things that they see. So, tell us a little bit more about Madeline since you've been so involved with that.

Madeline Hope: Hope: Well, the artists in the schools gallery... (unintelligible) is a partner to the West Marin BWET program and we receive this with the environmental action committee. That is our fiscal sponsor. So, they were the ones that were awarded the grant from NOAA and initially, they BWET program was very attractive to me personally because I saw that it was an opportunity to bring watershed education and training to our region, which really, the focus of the BWET is to bring watershed education and training to the school-age children in coastal communities and we really haven't seen that funding show up in this region except for Wilderness Way in the valley. They did receive some BWET funding I think three years ago.

So, Artists in the Schools has always had an art practice, writing, and science component to it and the science piece of the... I felt what BWET could offer the Artists in the School program was a more rigorous science program, which Leslie has really kind of... she has really fully invested herself in the BWET program So, it's definitely way more hands on and Artists in the Schools continues to support the artistic expression and we've basically also teased apart the Tomales Bay Library Association as a partner to BWET as well and they are providing some writing workshops for all of the kids in the BWET program. So, it's ended up being a much more interdisciplinary program, which Artists in the Schools has done for the last 16 years, but it's gotten more in-depth science component now with the elective program that is in place at West Marin School.

Leslie Ivanbrook: Our other partners include Point Reyes National Seashore, Point Reyes National Seashore Association, SPAWN, and

Madeline Hope: Tomales Bay Watershed Council...

Leslie Ivanbrook: And we've also partnered with the Marin County Stormwater Pollution Protection... Prevention Program. Mix up!

Jennifer Stock: That's a lot of partners. That's a lot of work. I can understand how hard that is to coordinate, but one thing I wanted to ask about is

science is something that's kind of falling off the charts in schools these days with emphasis on math and writing. Can I get a yay or a nay from the students. Do you have a lot of science going on in school or more math and English skills.

Students: More math and English.

Jennifer Stock: More math and English.

Student: I feel like we do a lot a science too.

Jennifer Stock: Now you do with BWET, right? I think that's one of the big strengths of BWET. It's bringing in a little science, but talk about that a little bit more. You said a little bit more science?

Student: Our teacher Mr. (unintelligible) school teaches science, but he doesn't really do experiments. So, we do experiments from BWET and it makes our science experience more fun.

Jennifer Stock: Oooh. You just tapped into something I like to hear. It makes your science work sound more fun. So, this has been a fun learning experience.

Student: Yeah.

Jennifer Stock: Cool. I have five students from West Marin School here and I'd love to go around the room real quick and if you would mind telling everybody your name, get nice and close to the microphone and what grade you are in and we'll start over here with Holten.

Holten Johnson: My name is Holten Johnson and I'm in sixth grade and I attend West Marin School.

Jennifer Stock: Thank You.

Peter Hope: My name is Peter Hope and I'm in eighth grade and I attend West Marin School.

Sylvia Lopez: My name is Sylvia Lopez and I'm in sixth grade.

Student: My name is (Unintelligible) and I'm in sixth grade.

Eduardo Romo: My name is Eduardo Romo and I'm in eighth grade.

Jennifer Stock: Fantastic. Well, thanks all for coming down to the studio. So, we got a little bit of background on what the BWET program is, but I

want to hear from you all about what are some of the experiences that you've been doing through the BWET elective course at school and it can be some of the classroom activities that you've done that's new or some of the in-the-field experiences. Does anybody want to give it a start talking about some of the activities you've done? Eduardo.

Eduardo Romo: Well, I thought the field trips were really fun, like, going out to the creeks and going out to the, like, the beaches and seeing all the tide pools with little hermit crabs and all that stuff and I thought that was the funnest to me.

Jennifer Stock: What are some of the things that you did in the creeks.

Eduardo Romo: Well, we tested the water flow. We put lemons inside the creek to see how fast it was and...

Jennifer Stock: You put lemons in the creek?

Eduardo Romo: Yeah. We put lemons in the creek and we had, like, a little race and yeah.

Jennifer Stock: And so, the lemons raced to determine the stream flow.

Eduardo Romo: Yeah.

Jennifer Stock: So, was it fast or was it slow?

Eduardo Romo: It was kind of slow.

Jennifer Stock: Slow. Was it before a rain or after a rain.

Eduardo Romo: It was after a rain...I can't remember very well.

Leslie Ivanbrook: And how many lemons were in the water at one time when you did it.

Student: There was two in the water.

Leslie Ivanbrook: Okay. So, it was a race. So, there was always one that made it to the line first and one that was second and what did that tell you usually when you did that?

Student: It told us where like, the water was flowing faster on the left or the right and if it was deeper or something.

Jennifer Stock: Oh, so it's different throughout the width of the creek. The flow is different. Interesting. So, how does that...this is a test. How does that flow rate change the ecosystem in that creek. What are some of the things that you look at if it's fast or slow or what are some of the things you learn about with that?

Student: It kind of effected the animals that were in the creek and the little critters like scud, which are the most common invertebrate and so, we were looking for animals and we found one little freshwater guppy, I think it was, but yeah. That was a fun task because we got to put mud in the nets and dance in front of the nets and stuff.

Jennifer Stock: That's neat. Now, you did something...did you do some of this Sylvia where you did this sifting of sand? Was that one of the activities you were a part of? The sediment sifting.

Leslie Ivanbrook: Eduardo and Peter.

Jennifer Stock: So, each of the grades did some different activities? And that's part of the program and some of the younger students can eventually go to some of the other activities that they can't do in the 6th grade or 7th grade.

Madeline Hope: So, how the program is set up this year is that it's a trimester system and so, in the first and third trimester for the most part, a majority of the students were sixth and seventh grade and the second trimester was predominantly eighth grade students and so, that's a Tuesday elective from 11:30 to 12:15 and inside of each trimester there are at least two hands on field trips that that class of kids will go to and what happened different for the eighth grade last year is that there were three 8th graders that weren't in an elective yet until the later part of this trimester, but we did total class field trips. So, when we went to Thomasanny Creek, which is what Eduardo is talking about and Peter, they did the different tests. So, they did...one was the flow test with the lemons and then they did creek profiling and the invertebrates and those were the three tests.

Student: And sifting sand.

Madeline Hope: Oh, and the grain size evaluation. So, there were actually four and so, what Holten and Ionne did in first trimester...

Student: ..and Sylvia.

-
- Madeline Hope:* And Sylvia is in this trimester now. So, what those two did was they went to Lagunitas creek at Devil's Gulch and they did, you guys also did a flow test, right? Remember? The lemon test?
- Student:* Yeah.
- Madeline Hope:* So, that's just so you know how it's set up. So, all these kids have done a little bit of something different, but you guys might have to offer up some of that for Jenny.
- Leslie Ivanbrook:* And the differences were determined in large part because of the different seasons and the different levels of water flow, which enabled us to get into creeks at certain times of the year and not at others. So, the eighth grade actually also did one of their field trips was just walking from school down to Thomas Scenic Creek and following storm water.
- Jennifer Stock:* Yeah, let's hear from that. Is it Eduardo and Peter that are the eighth graders here. I think this is an interesting activity to follow your actual watershed by foot. Can you describe what that was like in terms of the habitats and different things that you noticed along the way?
- Student:* Well I think when you're walking, you notice a lot of things that you don't notice when you're driving, like when we were with one of the people that came to help us, he pointed out that above the water was saltwater and below it was freshwater and the freshwater usually carried all the pollution and stuff, but I never would have thought of that.
- Leslie Ivanbrook:* The salt is little bit heavier, so it sits on the bottom, right? Fresh is on top.
- Jennifer Stock:* Especially right after the rain. It gets must more accentuated because you get all of this extra fresh water coming in.
- Madeline Hope:* And then the activity that that group did before coming out of the classroom was...you guys did that experiment with fresh water and saltwater where the saltwater was dyed blue and then...so, you could see the density difference.
- Jennifer Stock:* Was anyone surprised to learn that water is not totally evenly mixed?
- Student:* A little bit.

Jennifer Stock: It's kind of interesting, huh? So, how about you what did you like? What were some of the activities that you liked to do?

Student: I liked going to the ? wetland and we put nets in the creek and we caught the fish and measured the fish and that was fun because we got to touch the little fish and they were really cute.

Jennifer Stock: What kind of fish were they?

Student: Tidewater goby and a stickleback?

Jennifer Stock: Wow. Those sticklebacks are so cool. I love them and the gobies are cute too. So, those are pretty small fish. What type of ecological role do those small fish play in the wetlands for other animals?

Student: There was a pipefish too.

Jennifer Stock: You saw a pipefish too? That's really cool. Awesome. How about the fish? So, do you have a good idea of what role they play ecologically? Do they eat other things or are they prey for other animals?

Student: They're kind of both.

Jennifer Stock: Exactly. So, what do you think they're eating?

Student: Like, little bugs and stuff?

Jennifer Stock: Insects and plankton maybe?

Student: Yeah.

Jennifer Stock: Did you see any birds hanging around?

Student: Uh-huh.

Jennifer Stock: Up in the wetlands?

Student: Yeah.

Jennifer Stock: What type of birds?

Student: A kite...like a meadow kite.

Jennifer Stock: Wow.

-
- Student:* I think we saw a heron or an egret or something.
- Jennifer Stock:* Excellent.
- Student:* And an osprey.
- Leslie Ivanbrooke:* And there was something special about us catching the tidewater goby that day. Do you remember what that was?
- Student:* The tidewater goby...we were one of the first people to catch one in that creek because it was a new creek or something.
- Jennifer Stock:* You guys are the explorers of this new wetland. This is pretty exciting because this is all new habitat that's been reinvigorated with the restoration happening. So, you guys are probably the first ones to make some initial discoveries.
- Madeline Hope:* And do you guys go in your plain clothes and shoes into the water like just...and get sopping wet?
- Student:* No. We put on waders and they are these things that are like pants, but they go up to your chest and they have little straps. So, they're kind of like overalls, but you can walk in water.
- Student:* Like giant boots.
- Student:* Oh yeah, and they have giant boots attached to them and yeah...
- Jennifer Stock:* Excellent. For those of you just tuning in, this is Ocean Currents and my name is Jennifer Stock and we're talking with students from the West Marin School who have been doing a very thorough study of the watershed that leads to Tomales Bay into the Pacific Ocean and we're talking about some of their activities.
- Leslie Ivanbrooke:* Go ahead, Madeline.
- Madeline Hope:* Now, what I was just going to say, maybe Sylvia can talk to this. Sylvia is one of the photography students at West Marin School. She's in an elective that is being sponsored by the Artists in the Schools program and one big part of BWET has been over the course of the three trimesters is photography and Sylvia has really taken an active role in doing a lot of the photography. Do you want to say a little bit about that, what you photographed at Duxbury Reef or Drake's Beach or on those field trips?

-
- Sylvia Lopez:* We photographed the garbage that we found and the animals that we found too and just the plants and the garbage that they showed us.
- Jennifer Stock:* So, did you find...was this in the creeks that you found garbage or was this out at the beach?
- Sylvia Lopez:* The beach.
- Jennifer Stock:* That's the beach cleanup that I was out with you, right? Interesting. Now, Sylvia, you're in it this semester. What are some of the other outdoor watershed explorations that you've been able to participate in?
- Sylvia Lopez:* We went to Duxbury Reef and we went to look at the tide pools to see the weeds and stuff and what was there.
- Jennifer Stock:* And it was a pretty bad weather day, right? It was pretty windy.
- Sylvia Lopez:* Yeah.
- Leslie Ivanbrook:* Any adventure is, though.
- Madeline Hope:* And the BWET class right before going on that field trip, do you remember what we did in the art room with...remember we made those...what did we make?
- Sylvia Lopez:* We made, like, these square tube...squares...
- Jennifer Stock:* Is that the quadrat?
- Sylvia Lopez:* ...so that we could see where the weed was.
- Jennifer Stock:* The algae?
- Sylvia Lopez:* The algae.
- Leslie Ivanbrook:* The rock weeds.
- Sylvia Lopez:* The rock weed.
- Jennifer Stock:* The rock weed. Right. And did you count them? Did you get a chance to use the quadrat where you lay it down in the habitat and count stuff in the squares?
- Sylvia Lopez:* Yeah.

-
- Jennifer Stock:* That's neat. What was that like?
- Sylvia Lopez:* Fun.
- Jennifer Stock:* Was it fun. Do you think you might want to do that again?
- Sylvia Lopez:* Yeah. It's cool.
- Leslie Ivanbrook:* How would you like to have a job doing that and getting paid and having health insurance and just doing that every day going to work. Those are the kinds of fun science jobs that you can go out and do.
- Jennifer Stock:* Yeah. So, actually, I want to hear a little bit more from you. I haven't heard from you Holten. I keep saying Holden, thinking Catcher in the Rye. How about you? What were some of your favorite activities?
- Holten Johnson:* I think my favorite activity was when we went to Devil's Gulch and we tested the temperature of the water and the flow and it was really cool because we got to walk in the water with our waders and it was really fun because we got to hang out with our friends also.
- Jennifer Stock:* Yeah. Did anyone accidentally dip into the water, getting water into their waders?
- Holten Johnson:* Yeah.
- Madeline Hope:* Oh, no! Never!
- Student:* I did.
- Jennifer Stock:* That would be a little scary if you got too much water in there.
- Leslie Ivanbrook:* Well, that day, do you remember when we went there? That was in the beginning of the year and that was before the rains. So, the water was not deep and that was one reason why we were able to go there. We could not go there in the middle of the winter.
- Jennifer Stock:* Now, I want to hear also, I worked with some of you in the classroom. We did an activity. Does anybody remember the name of that activity?
- Student:* The bird beak buffet.

-
- Jennifer Stock:* Bird beak buffet. Tell our listeners what bird beak buffet was all about. Alright, go ahead.
- Well, they gave us different types of...
- Student:* Utensils.
- Student:* ...utensils that were representing beaks to pick out different kinds of foods with, like, marbles and beans and a whole bunch of other stuff and it was a science experiment to see if..what types of beaks were better at eating different kinds of foods.
- Jennifer Stock:* And what do you remember...which of those hypothetical beaks was one of the more successful at feeding tools?
- Student:* The tweezer beakers.
- Jennifer Stock:* Tweezer beakers. So, each of the tools represented a different type of beak on a type of shorebird because that's something that you probably saw a bit of on your explorations that different birds have different sized beaks and some of them feed really fast and slow. Now, on the last round of that there was a surprise food source that none of the birds...students...knew they were eating. What was that.
- Student:* Trash.
- Student:* Yeah, it was black beans, but it represented trash and plastic.
- Jennifer Stock:* Was that a little scary when you found out that you ate that?
- Student:* Yeah and our group ate...
- Jennifer Stock:* Way too much. Well I think that's an interesting lesson because that's something that's happening out in the ocean right now.
- Leslie Ivanbrook:* And when we went out to Drake's Beach, when we arrived, all of the sixty students and teachers were all up at the parking lot and looking down on the beach and the tide was super high and so, we couldn't get around the corner or anything like that and we look down on the beach and I, personally, I looked and thought, "There's sure not a lot of trash out there. We're not going to have much to do." And then, started the...we had Richard James came and talked and Jennifer talked and the kids all contributed to kind of get ready to go out on the beach and what I thought was interesting is that as soon as we got on the sand, it was littered with

tiny pieces that were about the size of the beans and marbles and elastic bands and stuff like that that was in this classroom activity. All the plastic had broken down, for the most part, into these small sort of bite-size pieces and it was densely covered at Drake's Beach up in the... what's the name of the line, you guys, that's the edge of the water coming up?

Student: The high tide.

Leslie Ivanbrook: That's right. And so, that was pretty interesting. What did you guys think about that?

Student: There were a lot of little piles of trash and I was surprised that there was so much trash.

Student: We found things from China and Peru and...

Jennifer Stock: That's right. Richard gave us a little talk about the things he finds. Remember Richard is a resident out here that walks the beaches a lot and has become a bit of a trash fiend and it's interesting because there's a big network of people out there that share their findings on the beach because there's stuff coming from all around the Pacific Ocean that lands on our beaches. It's pretty interesting. So, he was sharing stuff that he's seen from China or Korea or Russia that have come up on our beaches.

Leslie Ivanbrook: And do you guys remember how those things get from China and Korea and places in Asia and end up on our beaches?

Students: The gyre. The Pacific Gyre.

Student: And I thought some of the stuff we found that day was really weird.

Jennifer Stock: Like what?

Student: Some people found needles before we came there from like hospitals and then there was the water bottle with Chinese writing that we couldn't understand and...

Jennifer Stock: Do you remember collecting those little round....

Students: Nerdles!

Jennifer Stock: What's a nerdle?

Student: They're those things from beanie babies and...

Jennifer Stock: Yeah, they are in beanie babies. It's an industrial plastic pellet. Sometimes they're in beanie babies or bean bags, but those are things that are melted down into plastic, which we were surprised to see so many of.

Madeline Hope: What was the other thing, Holten, that you said?

Holten Johnson: There were a lot of shotgun wads.

Madeline Hope: And so, all of those plastic products are made with that same needle. So, they get shipped to the different companies that make the shotgun case and then they're shipped to the beanie baby factory and so, it's a resource that people are ordering and spending money on to make these different things and what we want to try to affect is folks making better choices and not choosing those plastic products as much, even though I know that shotguns are tools for some, I think that it's a real important part of using that kind of tool to clean up after yourself too.

Jennifer Stock: Yeah. I think the students saw that really clearly too. I remember everybody was really surprised, bringing up all of these little things to me and showing me and we got a lot more than I thought we would, to tell you the truth. Leslie?

Leslie Ivanbrook: And what did we see out there? We saw some wildlife.

Jennifer Stock: That's right! As soon as we got off the bus!

Student: We saw porpoises and whales.

Student: Two whales.

Jennifer Stock: Did you see the whales as soon as you got off the bus?

Student: Yeah.

Jennifer Stock: That was pretty cool. We saw two grey whales right around the corner at Drake's Beach and then we saw some, I think harbor porpoise, probably, near-shore. That was very cool. What else did we see?

Leslie Ivanbrook: And what did we see on the beach? Do you remember?

-
- Student:* There was a bird with a hurt wing and it was running away from the kids who were chasing it.
- Jennifer Stock:* And what have we learned about chasing wildlife on the beach.
- Student:* We shouldn't chase birds.
- Jennifer Stock:* You shouldn't chase birds, especially hurt birds. Would you like to be chased around with a broken ankle?
- Student:* Then, when we were looking for trash at one end of the beach, we saw these little crabs that were...they aren't really crabs, they're like sand crabs. So, they dig and they were everywhere and there was like a billion of them...and if you kick the dirt, then they would come out of the dirt that you kicked. It was kind of funny.
- Jennifer Stock:* And then buried themselves again?
- Student:* Yeah.
- Jennifer Stock:* Sylvia, you were going to say something about the beach. What were you about to say? Something about the whales? Ok. Well, you know, we're about at a half hour break here. So, we're going to take a short break here and reconvene on things we'd like to talk about, but for those tuning in, you're listening to Ocean Currents and I think I have some sounds here that were collected in the watershed with this group and we will play these in a little bit and we'll be back in just a little bit.
- (Sounds from the watershed)
- (Music)
- Jennifer Stock:* Welcome back. You're listening to Ocean Currents and my name is Jennifer Stock and in the studio with me, I have Ionne Hope, Holten Johnson, Sylvia Lopez, Peter Hope, and Eduardo Romo with Madeline Hope and Leslie Adler Ivanbrook, all part of the West Marine School BWET, Bay Watershed Education Training program and these students have been walking around trouncing around, putting waders on, sampling water, investigating tiny little microscopic organisms, learning about our watershed. So, did anybody do any experiments anywhere in regards to any of these visits?
- Student:* In our class, we filled up containers that were cut in half with different materials such as sod, sand, and dirt and we tested how

fast the water flowed through them to the bottom and we timed it and there were groups and each group came out relatively with the same answer. So, that one was pretty fun.

Jennifer Stock: And what was the answer or what were the different rates? What was the fastest and what was the slowest?

Student: I'm not quite sure, but I think the fastest was the sod.

Leslie Ivanbrook: No.

Student: No? Oh, yeah. The gravel.

Leslie Ivanbrook: And blacktop, yeah you're right and empty container, which represented blacktop.

Jennifer Stock: And so, this was an experiment that was about surfaces that water sits on, right? And so, this was about how water moves once it comes from the sky in rain and if it's a surface that water will sit on top of or water will move through, right?

Student: Yeah.

Jennifer Stock: And what did you discover? What type of surface is good for water to move through?

Student: Sod and dirt and sand.

Jennifer Stock: Dirt and sand.

Student: Natural things.

Jennifer Stock: Natural things.

Student: Do you mean like, slow it down?

Jennifer Stock: Yeah. Slow it down so it doesn't go super fast.

Student: Yeah, I think sand was the slowest.

Student: And then, like sod.

Jennifer Stock: So, this type of surface is good for having something that drains slower is good for near watersheds.

Student: Yep.

-
- Jennifer Stock:* And why is that?
- Student:* So that you don't get pollution and, like, bad chemicals in the water.
- Jennifer Stock:* Bad chemicals get filtered out or do they move? How does that work.
- Student:* Well, then if a lot of rainwater is not getting to the creeks from soil from our ocean, then you don't get as much of the chemicals in the water like shampoo and gasoline and stuff.
- Jennifer Stock:* It can filter out. So, if you had water moving right off the street with oil sitting on the surface, that would move pretty quickly and go right to the creeks and the ocean and that's bad
- Students:* Yeah.
- Madeline Hope:* And what else is another factor that effects how fast the water is moving? Were your cartons...?
- Student:* The angle of the cartons and the slope.
- Madeline Hope:* So, the slope of the land. So..
- Jennifer Stock:* So, less slope is...
- Student:* Slower.
- Jennifer Stock:* So, higher slopes, steeper slope would be faster.
- Leslie Ivanbrook:* And one thing all of these kids did is mix off... office, which is county of Marin, they lent us a diorama. So, all of you actually did do the diorama activity and so, can you talk a little bit about that?
- Student:* What we did with the dioramas, we inserted different pollutants and we poured water like rain out of a spray bottle on it and saw where they want and there was like a giant bottom of water at the bottom and then it was kind of like, on a hill, so, when we poured rain on it, it would flow to the ocean.
- Leslie Ivanbrook:* And Sylvia, yours was a little different this trimester. Can you tell the kids and Jenny how the diorama that you worked on was different than what Peter is saying?

-
- Sylvia Lopez:* Well, we had these little tubes and we had to put them into little holes and they would come out of the other side like...were presented different kinds of stuff.
- Madeline Hope:* So, the water circulated. There was a pump and the tubing allowed the water to recirculate through this diorama model so that you'd have constantly flowing creeks.
- Jennifer Stock:* Interesting.
- Madeline Hope:* How did that facilitate you guys understanding of what happens with pollutants when the creeks are moving? What could you see?
- Student:* Different. It was like...the different colors of the creek from oil and...
- Jennifer Stock:* The colors represented not so good things.
- Student:* Yeah, like oil and stuff.
- Madeline Hope:* You could really see the plumes much more clearly with the water flowing through the diorama and when we picked it up the first two trimesters, we really, I thought that it was broken, but it was just that the pump was broken. So, then I went and got a pump and we hooked it up and it worked perfect and it really, I think, gave kids a much better sense of actually how water does circulate in the watershed and so, when the pollutants got applied, you started to see the big rings, you started to see the plastic flow and so, it was actually really cool.
- Leslie Ivanbrook:* It all drained in the Bay and that's where you saw the plume coming out into the Bay is if we've seen photographs of plumes in the ocean coming out over river mouths.
- Jennifer Stock:* Yeah. Have you guys been seeing pictures from this oil spill in the gulf of Louisiana? That's different because it's from an ocean source, but you can see pictures of how that water is moving around. What do you guys think in terms of the...we were talking about the model that shows how pollutants move into a watershed. What are some potential pollutants that could move through our watershed here in West Marin?
- Student:* Oil.
- Jennifer Stock:* Oil. From...?

Student: Cars.

Jennifer Stock: Cars. Yeah. Also, think about San Francisco Bay too. When you were talking about the surfaces, I was thinking of San Francisco and those steep hills and those impervious surfaces and straight down the hill and that is another very important watershed here on the west coast.

Student: Like litter and stuff.

Jennifer Stock: Plastic and garbage.

Student: And definitely shampoo that goes through your sewer system.

Jennifer Stock: So, what can we do to do better in terms of protecting the watershed with some of those things you mentioned: garbage, plastic, shampoo has some types of chemicals in it, surfacants, that don't really break down too easily. What are some of the things you learned that we can do to be good stewards of our watershed.

Students: Recycle, no dumping in storm drains. As a matter of fact, we put these little medallions, yeah, it said no dumping it leads to a watershed and...yeah.

Student: There's actually one right outside the studio. It's on every storm drain. They have a blue decal with a salmon.

Jennifer Stock: Excellent. So, do you feel now, with your in depth experiences, that you want to take better care of your watershed here.

Students: Yeah.

Jennifer Stock: How so? How will you do better?

Students: Pick up trash. Use a reusable metal water bottle and you won't have to buy plastic anymore.

Jennifer Stock: Cool.

Student: They also gave us a clean canteen medal.

Jennifer Stock: How many of you are using it. I got 3, 4 hands. 4 hands. That's great. That's excellent.

Leslie Ivanbrook: My son doesn't use a water bottle. It's so sad.

-
- Jennifer Stock:* You've heard that folks. Battle at the homestead. That's great. What are some other things. You're talking about re-using materials so we have less waste, not dumping down storm drains. What are some other things we can do?
- Students:* Pick up trash even if it's not yours. Remind people to pick up their own trash.
- Jennifer Stock:* That's right because you actually are a new generation of ocean stewards here. You have to share all this stuff.
- Leslie Ivanbrook:* Fix leaky septic systems.
- Student:* Try to use cars like only when you really need to.
- Jennifer Stock:* Yeah. We're really going to have to work on adapting how we use automobiles, not only for the gas that it emits and the oils, but also for the carbon emissions.
- Student:* If you need to get somewhere that's close, just ride your bike, if you have one.
- Jennifer Stock:* Right on.
- Madeline Hope:* And then the other point, Rebecca Johnson from Cal Academy, when we were at Duxbury Reef, remember before going out on the reef, remember what she was trying to sort of impress on you guys about before we go on the reef, we want to be aware of what?
- Student:* The little...the animals that were there, not to step on them and be careful.
- Jennifer Stock:* So, be aware of the wildlife all around us so that we can respect that. That's good.
- Student:* Yeah. We want to watch where you walk and like you said, we don't trample plants.
- Jennifer Stock:* Excellent. So, do each of you think you might want to learn a little bit more about ocean and waterbed ecology.
- Student:* Yeah.
- Student:* Maybe.

Jennifer Stock: Maybe?

Student: Yeah I do. I was just kidding.

Jennifer Stock: Do you think you might want to take your own initiative maybe with your family to go explore some of these other areas this summer?

Students: Yeah.

Jennifer Stock: Alright. How about this last question here. What would you, each of you, like to tell listeners about the importance of a watershed and our role as humans living inside a watershed?

Student: Well, the watershed is what provides all of our water and if we pollute our own water, it's....bad.

Jennifer Stock: It's bad. so, take care of your shed. Eduardo, do you want to add to that?

Eduardo Romo: The trash spreads.

Jennifer Stock: The trash can spread.

Eduardo Romo: Yeah, and especially because we live in a watershed because that's where it all goes, in the ocean.

Jennifer Stock: So, after Western Days Parade, what are each of your going to be doing?

Student: Picking up the trash that everybody left.

Jennifer Stock: Or remind them to keep it off the ground too, right?

Madeline Hope: And the Lion's Club is very interested in paying young people to help pick up trash afterwards. So, talk to me if you want to do that. Any of our listeners out there, we want young people to come and help with that and you know what the problem is with trash is that it's a lot of single-use disposable stuff and that is what we need to change. People need to not use that single use disposable material.

Jennifer Stock: I've started carrying my own silverware with me and you know what, it was crazy. Why haven't I been doing this all along? It's so easy! Okay. How about you, Sylvia? Is there anything you would like to share with listeners about the whole watershed and how we should live with it?

Sylvia Lopez: Recycle.

Jennifer Stock: Try to recycle more.

Sylvia Lopez: And not buy plastic.

Jennifer Stock: And not use plastic. goo. Reuse. Peter, how about you?

Peter Hope: I think that it's just important to...if you see a glass bottle and a plastic bottle or something, you should get the glass bottle because glass isn't as bad for the environment as plastic.

Jennifer Stock: Good. How about you Holten?

Holten Johnson: I think it's important to take care of our watershed because our watershed provides our water and without water it's be hard to live. So, if you're polluting, it's like, polluting yourself because you eventually will drink the water that's getting polluted.

Jennifer Stock: Excellent. Good job.

Madeline Hope: And what else does it provide? Things that we eat, right?

Student: It provides animal life.

(Unintelligible)

Madeline Hope: You don't like food? Oh, I can stop shopping. Did you say you don't like food?

Student: I said I don't like fish.

Jennifer Stock: Well, it provides habitat for something that somebody else might like to eat. Well, I just think what you guys have been doing has been so cool and I can tell that you've been having fun because every time I've gone to your school, you're giggling and enjoying it and using words like invertebrates. Not that many eighth graders use that word freely. So, that's pretty cool and also, I hope that you'll make a point to thank your teachers for working so hard to make this program happen as well as Leslie and Madeline. So, thank you.

I wanted to ask one more thing, actually. Is there going to be an art show kind of culminating all the work this year with the...? ...talk about that a little bit.

Madeline Hope: Well, at the end of the school year, each year artists in the schools galleries in the schools has an exhibit at Toby's Gallery. So, we will be presenting a lot of student work from the BWET program in addition to other projects that other grades have done and that is one thing that I just wanted to bring up with these kids is that at the end of each trimester the students are basically, they put together a short presentation for the fourth and fifth grades and so, each trimester, you all basically were sharing your learning and your artistic outcomes and your scientific explorations with the fourth and fifth grade students.

And we talked about some of that today, but those will be some of the displays that are in place at Toby's and that exhibit opens June 7th on the Western Weekend Parade.

Jennifer Stock: Perfect. Excellent. It's always a great way to start that weekend off.

Madeline Hope: Yeah.

Jennifer Stock: Are each of you going to be down there to share your work?

Students: Yeah.

Jennifer Stock: Talk to the visitors about it on the opening day, maybe?

Student: Yeah. If it's during the Western Weekend Parade I'm going to be playing rock band.

Student: I am too.

Madeline Hope: But, the opening is actually after the actual physical parade and it opens from 1 to 3.

Jennifer Stock: Excellent. One to three. We'll check it out. Well, thanks everybody for your work this year and I hope that you'll carry some of these messages to your future grades as you move forward in school. You are already ahead of the game with your knowledge about your waterbed and what it means than a lot of students in other parts of the country. So, it's a pretty awesome program that you've been able to get through.

I have one thing here to share with you guys. You might have been wondering what these blue marbles are sitting on this desk here, but there is a movement happening around the world right now where there are one million blue marbles being circulated amongst

people's hands to represent ocean stewardship and a friend of mine actually started this program and a marble is given to people who have been showing ocean stewardship or doing good, positive ocean actions and you are to think about this marble and why you're getting it, what type of ocean stewardship actions you've done that you get this marble with, but you don't get to keep it very long.

You get to keep it for 24 hours. You can take pictures of it, you can write about it, but then you have to pass this marble on to somebody else who has been a good ocean steward and tell them the story of the blue marble and what this is all about is back when we started outer space exploration and the astronauts looked down at planet Earth, the first pictures of Earth they noticed how blue our planet was and it became known as the blue marble image. Have you guys heard of that before? The blue marble image?

And this year coming up in June is World Oceans Day. We're also celebrating Jacques Cousteau's 100th birthday, who was one of the pioneer ocean explorers that kind of showed us what this blue planet was all about and we really want to celebrate him and remember him for his great work. So, I have a blue marble for each of you to take with you today and there's a website you can go to called blumarbles.org where you can read more about the blue marbles that are circulating around the world and you can leave a picture up on the website if you want about your blue marble and your watershed. You can share your story there, but I figured it's time to get some blue marbles out to West Marin because there's a lot of good work being done out here and you guys are the beginning of a new era of watershed care as you move on in school. So, I have blue marbles for each of you here.

Madeline Hope: Did all of these people give you their blue marbles or did you go collect them from different people?

Jennifer Stock: I actually had these. I got one blue marble from somebody that had passed on, but these are others that I bought to keep going into the system.

Leslie Ivanbrook: Growing movement.

Jennifer Stock: It is! So, you know all about Facebook and Twitter. This is a real physical social movement. An actual passing on of something. So, here's some marbles for you guys and don't eat them with your tweezers. Okay.

Madeline Hope: Thank you, Jenny for hosting us on your program.

Leslie Ivanbrook: Yeah, thank you.

Jennifer Stock: Sorry, they're not all the same size, but that's ok. So, what are you going to do with these in 24 hours.

Student: Pass it on.

Jennifer Stock: And don't forget to tell the story of what the blue marble represents. Excellent.

Madeline Hope: And we can look it up if you need stuff to talk about, you can look up blue marble online.

Jennifer Stock: I have a little piece of paper for you guys too about that, blue marbles.org for anybody else and you know, in June is the culminating big event for World Oceans Day where lots of these pictures and stories will be revealed online at blue marble.org. So, check it out. Thanks again, you guys, for everybody coming into the study. It's kind of fun.

Madeline Hope: Thank you to NOAA for having faith in our community and giving us this opportunity to work with these great kids.

Jennifer Stock: That's awesome. I'm so glad our agency can help support good education like this. So, we're going to wrap it up here because we have a little cleaning up to do. So, thanks everybody. Do you want to say goodbye to everybody?

All: (unintelligible) Bye! Thank you.

Jennifer Stock: This is Jennifer Stock and we're signing off for Ocean Currents. We've had the students from West Marin School here talking about their BWET watershed education program and next month, we'll be back in June, Monday, the first Monday, I think it's June 5th or 6th. I have Scott Anderson coming into the studio talking about white sharks. So, that should be a really cool show right before World Ocean Day. So, hopefully there will be some more blue marbles circling West Marin by then and thanks for tuning in. You're listening to KWMR.

(Music)

Jennifer Stock: Thank you for listening to Ocean Currents. This show is brought to you by NOAA's Cordell Bank National Marine Sanctuary, on West Marin Community Radio, KWMR. Views expressed by guests of this program may or may not be that of the National Oceanic and Atmospheric Administration, and are meant to be educational in nature. To learn more about Cordell Bank National Marine Sanctuary, go to cordellbank.noaa.gov.