

Meet a Scientist Who Studies Underwater Currents

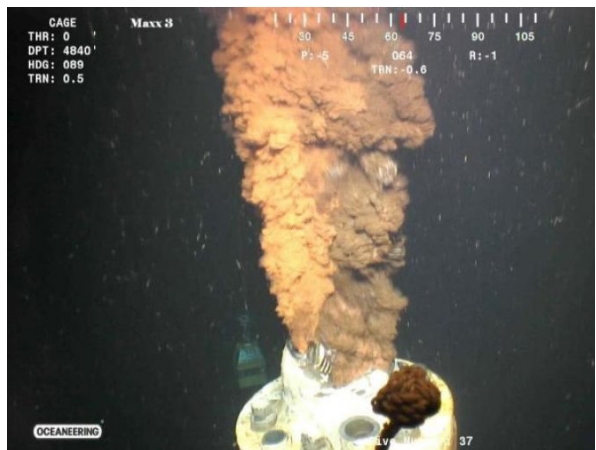
In the dark of night, a ship sails through cold ocean waters. On the rain-soaked deck, the crew is busy keeping the ship safe during a powerful storm. Inside a cabin, Amy Bower calmly enters important data into a computer. She will use the data to map out deep ocean currents far below the stormy surface. The data she collects will help construct a better understanding of the ocean currents in this region than ever before.

Bower is an oceanographer. She conducts research on ships in the ocean and in her lab to figure out where ocean currents are located. Her two main projects involve mapping ocean currents in the Labrador Sea and in the Gulf of Mexico.

Mapping out the deep ocean currents in the Gulf of Mexico became more important than ever on April 20th, 2010, when a tragic accident killed 11 workers and caused a massive amount of oil to pour from deep under the sea floor into the Gulf of Mexico. This accident, known as the Deepwater Horizon spill, was one of the largest oil spills in history. Equipment that was being used to drill for oil broke, and workers were unable to fix the problem for three months as 200 million gallons of oil flowed into the ocean. Oil spills harm birds, fish, and other wildlife, so people work hard to prevent spills and to clean up spilled oil. However, people have to know where the oil is in order to try to clean it up. Much of the oil from the Deepwater Horizon spill floated to the ocean surface, but some of



Amy Bower is an oceanographer. Here, she and another scientist hold a glass buoy called a float. They are getting ready to lower it into the ocean.



This photo shows oil pouring into the ocean during the Deepwater Horizon oil spill.

it sank and spread out, carried by deep ocean currents about 1,000 meters below the surface. As Bower and other scientists tried to figure out where the oil had spread and predict where it was going, they realized that they knew almost nothing about deep ocean currents in this area.

Bower and her team used underwater buoys called “floats” to trace the pathways of the deep ocean currents in the Gulf of Mexico. These floats track currents using sound, because, at this depth, the ocean is so dark that there is no way to see where they are going. After the Deepwater Horizon oil spill, floats were used to locate one deep current that flows all the way around the rim of the Gulf in a counter-clockwise direction. Scientists had suspected that a current like this existed, but this was the first time it was actually observed and tracked!

Learning more about deep ocean currents in the Gulf of Mexico and around the globe is important because these underwater pathways have huge impacts. From determining where pollutants (like oil) will end up, to figuring out how a warming climate will impact life on Earth, understanding ocean currents provides answers that entire ecosystems might depend on for survival. That’s why Bower cares so much about her work.

Bower traces her interest in the ocean to her childhood. She says, “I grew up on the Massachusetts seacoast and spent many days exploring the beaches, turning over rocks searching for skittering crabs, and jumping from rock to rock over streams of the incoming tide, imagining myself as a pirate.” In high school, she especially liked her math and physics classes. Eventually, she figured out a way to combine her interests by studying physical oceanography, which she describes as “the study of motion in the ocean.” Bower says, “I learned that I could combine my love of the oceans with my training in math and physics.”

Early in her career as a scientist, when Bower was about 25 years old, she learned that she has a disease that affects her vision. Over the years, she has been able to see less and less. Today, she has only a tiny bit of usable vision and uses a guide dog to get around. She has software that magnifies what is on her computer screen and other software that allows the computer to talk to her. She uses this technology to do her research.

Bower’s advice to kids who love science is to try out as many different science and technology fields as possible. She points out that people can take part in science in many different ways, saying: “It takes a village to do science—it takes teams of women and men with different skills and knowledge to solve complicated problems. I work with a team that includes engineers, computer programmers, research cruise organizers, ship captains and cooks, lab technicians and students. All are making important contributions to science.”