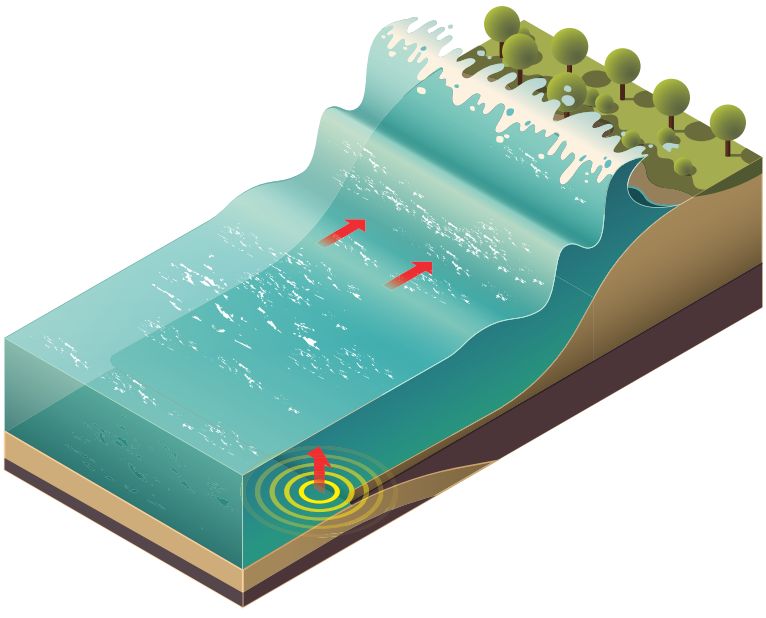
Esteban the Tsunami Research Scientist: Understanding Tsunamis

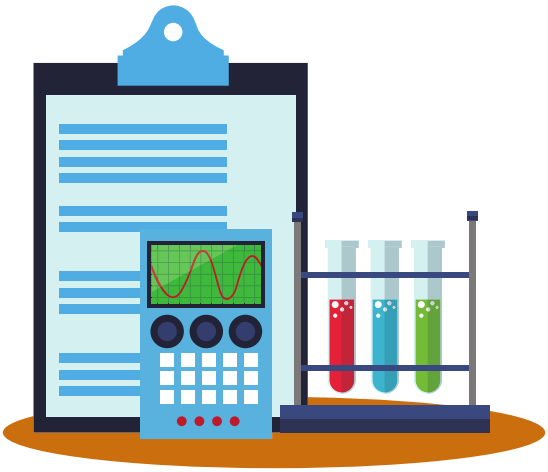
Who is Esteban?

Hi everyone! My name is Esteban, and I am a tsunami research scientist.

A tsunami is a unique type of wave that forms in the oceans. A tsunami research scientist studies how tsunamis form, what sizes they are, and where they travel to.

Some tsunami research scientists study waves in large laboratories. For example, they create waves inside large pools to learn about how waves move. Other tsunami research scientists collect information from real oceans and tsunamis. They study this information to learn as much as they can about when a tsunami forms and what happens to it as it moves through the ocean.





What I am Working On

In 2013, a new volcano island formed in the ocean near Japan. This volcano is very active, which means it can erupt often. When a volcano erupts, it shakes, and this shaking can cause a tsunami to form.
If a tsunami starts to form, the people in Japan need to hear about it as early as possible. This will give them a lot of time to get ready for the tsunami and move to safe areas if they need to.

Right now, I am designing a water robot that will be able to look out for future tsunamis that might form from the volcano! Robots are machines that can do specific jobs people program them to do. My water robot will swim around in the water around the volcano and measure changes in how the water moves. For example, if the volcano starts to shake, my robot will be able to tell if the water is moving in a way that means a tsunami is coming to the shores of Japan. My team will be watching for this information on our computer back at the lab!

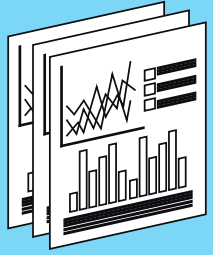
Why Are Robots Necessary?

Robots are necessary for many reasons. Here are a few examples:

Robots can work in places that are too dangerous for humans to go to.
For example, a water robot can get extremely close to a volcano. It would be dangerous for a person to get near a volcano that might erupt!

Robots can also collect and measure information without making mistakes. When people measure things like the speed of water or the height of water, they might not get it exactly right. People can make mistakes more easily than a robot that has been programmed to do a task. Using the correct information in science is very important.

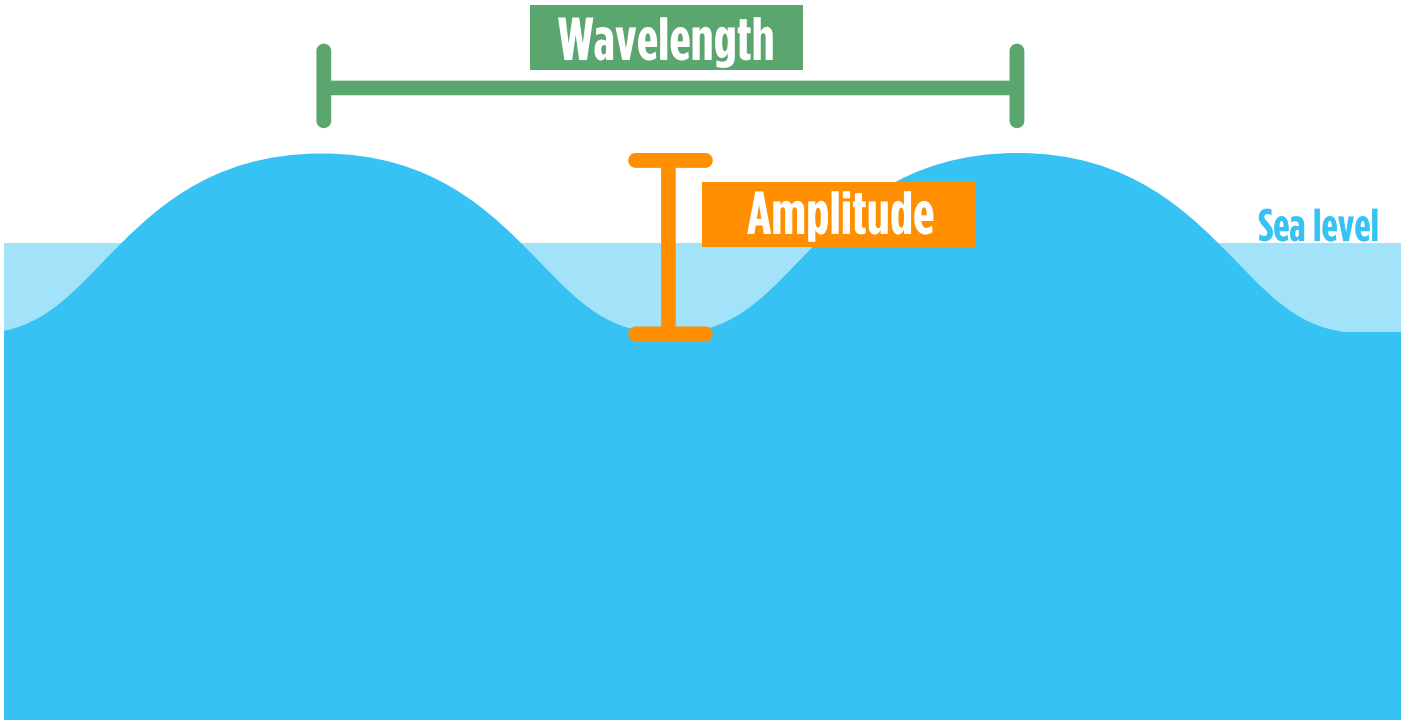
Why do you think this is true? What might happen if the wrong information is used to look out for tsunamis?



Predicting a Tsunami

If a tsunami is going to form, my water robot will also be able to predict how tall a tsunami might become. The size of a wave is measured by how high and wide it is. The height of a wave is called its amplitude. The width of the wave is called its wavelength.

Look at the diagram of a wave to see the amplitude and wavelength.



To predict means to think about what might happen to something. For example, Esteban might predict a tsunami would form if the volcano erupts.

Predicting Sizes of Tsunamis

My water robot will be able to tell what the amplitude and wavelength of a tsunami will be before it arrives to the shore. If a tsunami is going to be small, people might not need to prepare for it. But, if a tsunami is going to be very big, people would need to evacuate. This means they would need to leave their homes.

Did you know?

Large tsunami waves are powerful and can move objects, like cars and even buildings!

Did you know?

Some tsunamis can move at 500 miles per hour in the open ocean! That is as fast as a jet plane!

I need to keep working on my robot before I can put it in the ocean to determine when a real tsunami is going to happen.