

COASTAL GEOLOGY – WAVE HEIGHT MEASUREMENTS

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Now we've seen how the water moves parallel to the shore-- called the long-shore current-- now we want to look at the component called waves and that wave energy. So we're going to just quickly review the parts of a wave and then we're going to go into the water and take a series of wave height measurements.

And as in every science, we take measurements in triplicate form. And that's so that we can get a good average and it also accommodates for any human error in measuring differently-- different people taking slightly different measurements. So we'll take an average of three measurements, and we have volunteers that are going to help us to do that.

And so all of today's activities are measurements and data that we have to collect in the field. We will take samples from the field and take those back to the lab to do further analysis. So let's go ahead and continue gathering as much data as we can during our field trip to the beach.

So quickly, just to review the parts of a wave, a wave has two parts. We have the highest point of the wave. That's called the crest. I'll put a C there to remind us. And then the other half of the wave is the lowest part of the wave, and that's called the trough. So we are going to be standing in the water and we're going to use our bodies and these meter sticks to measure the highest point on the wave and the lowest part of the wave. And we're going to take three measurements with each pair.

And then some other measurements that are important to remember. If we go from crest to crest, this is called the wave length. And then the wave height is from the crest down to the base of the trough. So this would be length, and this would be wave height.

And then because we're talking so much math, let's go ahead and put the final measurement that we would have. We have something called the amplitude, and that would be half of the wave height. This represents the surface of the water. So this is the volume of water that's rising above the surface, dropping or trouging below the surface, and then rising again. As energy builds up, the height of the wave increases.

So now we've moved off the beach. We're standing in the water where the waves are, and we're going to measure some of those wave heights. Again, we're measuring the crest and the trough so we can get the height. And as you notice, as we pan out, waves are not really very large in this part of Florida this time of year. So it's very seasonal on the west coast. This is not generally where people surf. They would serve on the east coast where we have higher-energy beaches.

But waves are still moving and they still have a purpose. So let's go ahead and measure. We're going to measure on our bodies the high and low part of the wave.

OK, ready? So we have us 16 centimeter wave. What do we have over there? An 11 centimeter. Should have gotten a little more water building up. And what do we have last wave? Three heights, what do we have? About a 12? OK.

Just like the current, we have the variables that we need. So we'll take the average of those wave heights and come up with an average height for this particular time at Caladesi Island. So you need to remember all those variables we were measuring with the tide, the wind, and the air temperature. All of those things impact the movement of this water and the movement of the wind once it reaches land.