

Troubling Tides  
Part 1: Rising Seas Activity Sheet

Name(s) \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Read the procedure from beginning to end before starting or writing on the Troubling Tides Datasheet. The procedure includes the following parts:**

√	Steps #	Time needed for each step	Time remaining
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**Steps need to be completed in order.  
The first time indicates how long the step of the experiment takes.  
The last box provides the overall time, which can be monitored with the stopwatch.  
Check the box when the step is done.**

Define critical habitat.

Define inundation.

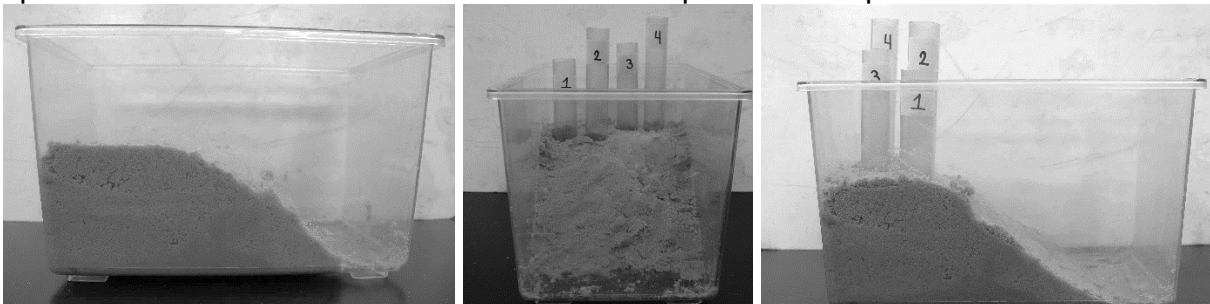
**Procedure**

<input type="checkbox"/>	Step 1	0 min	Complete by 0 min
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Start your timers! Times are provided throughout the procedure. Keep track of the time and stay on task.

<input type="checkbox"/>	Step 2	10 min	Complete by 10 min
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Create your beach profile with the sand provided. Choose two different distances for your four nests. Use fingers to dig two nests of different depths at each distance. Nest depths must be >3 cm. Use the tubes to hold the place and depth of the four nests.



Step 3	5 min	Complete by 15 min
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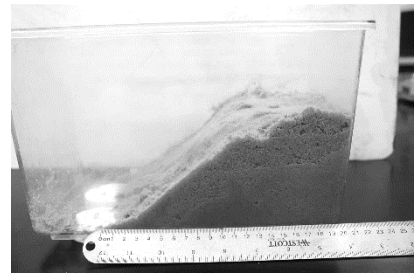
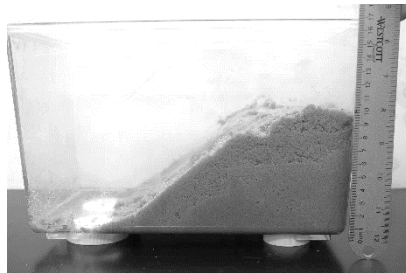
Raise your hand to indicate that your group is ready to put the clutch of eggs (effervescent tablets) into the nest. While waiting for the teacher to bring the eggs to your group, you can draw a diagram of the beach profile with the location of the four nests on the Troubling Tides Data Sheet. Label the nests as nest 1–4, and indicate the depth of the nest. (10 points)

Step 4	5 min	Complete by 20 min
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Calculate the slope of the beach your group created in the aquarium by the measurements of the rise and run of the beach you created. Record the calculated slope on the datasheet.

$$\text{slope} = \frac{\text{rise}}{\text{run}}$$

slope = \_\_\_\_\_ (5 points)



**To complete the next steps of procedure pour the amounts of water into the aquarium at the specified times. Fill out the table on the Troubling Tides Datasheet to show which nests were inundated with water and which were not. Write down the height of the water table when each nest (effervescent tablet) reacted with the water. Record your data in the table.**

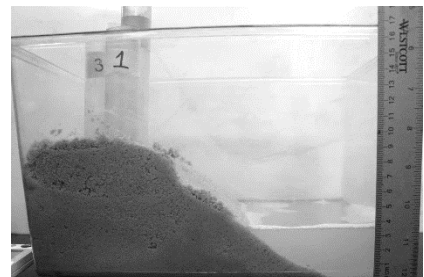
Step 5	3 min.	Complete by 23 min.
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Pour 500 mL of water into the deep side of the aquarium. This is the ocean side.

Step 6	1 min.	Complete by 24 min.
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Measure the height of the initial mean high tide of the water in your own aquarium.

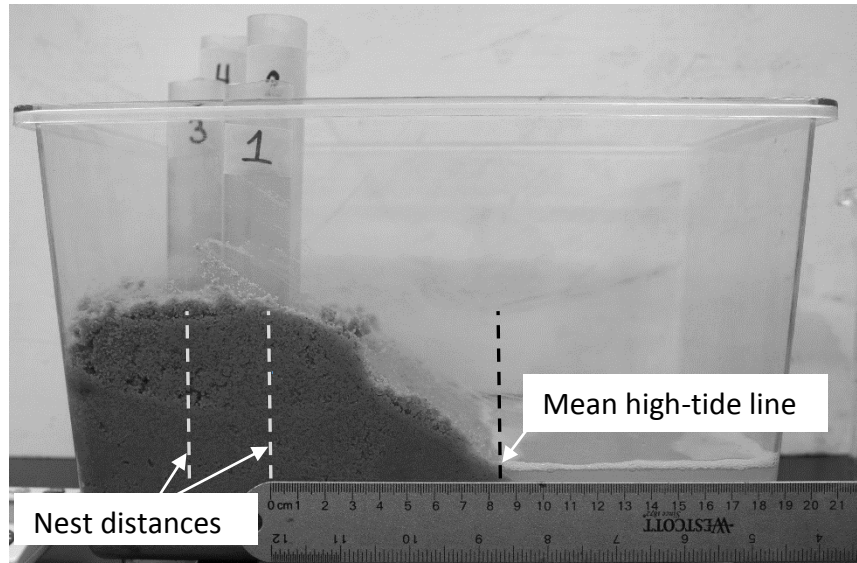
\_\_\_\_\_ cm



	Step 7	2 min.	Complete by 26 min.
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Using the beach your group created, measure the distance from the mean high tide line to each nest. Record measurements on the datasheet.

\_\_\_\_\_cm



	Step 8	1 min.	Complete by 27 min.
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*Event 1: Sea-level rise:* Measure 330 mL of water and pour into the ocean side of the aquarium. The 330 mL represents three years of sea-level rise.

	Step 9	2 min.	Complete by 29 min.
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Check if any of the nests have been inundated. If the clutch of eggs starts to foam or bubble, the nest has been inundated. Measure the sea level height after three years of sea-level rise. Record observations on the datasheet under the Event 1: Sea-level rise column heading

	Step 10	1 min.	Complete by 30 min.
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*Event 2: Storm surge*—Measure 600 mL of water and pour into the ocean side of the aquarium. Warming seas are predicted to increase the intensity and frequency of hurricanes.

	Step 11	2 min.	Complete by 32 min.
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Check to see if any of the nests survived Event 2: Storm surge. Measure the sea-level rise after the storm surge event. Record observations on the datasheet under the Event 2: Storm surge column heading.

	Step 12	2 min.	Complete by 34 min.
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Did any of the nests survive? This is the time to double-check the datasheet. Make sure all of the data and observations were recorded.

	Step 13	3 min.	Complete by 37 min.
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Take some time to wander around the room and see if the nests of other groups survived. Think about how the slope of the beach or the width of the beach may have affected nest survival.

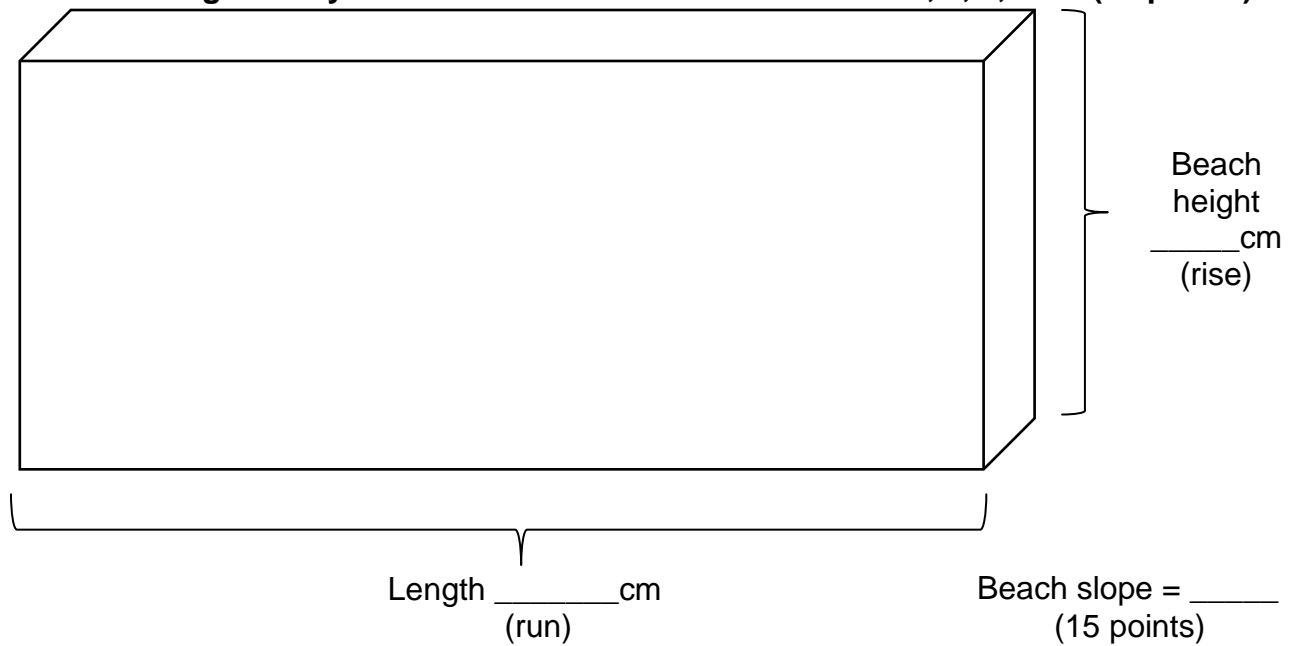
	Step 14	3 min.	Complete by 40 min.
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Stop your timer. Ask the teacher how to help with the clean-up process.

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Part 1: Rising Seas Datasheet

Name(s) \_\_\_\_\_  
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**Draw the diagram of your beach below. Label each nest as 1, 2, 3, or 4. (10 points)**



**Record the data and observations in the table below. All areas of the table need to be filled out (75 points)**

Nests	Initial mean high tide (____ cm)		Event 1: Sea-level rise Sea level height (____ cm)		Event 2: Storm surge Sea level height (____ cm)	
	Depth (cm)	Distance (cm)	Inundated Yes/No	If yes, water height when inundated	Inundated Yes/No	If yes, water height when inundated
1:						
2:						
3:						
4:						