OCEAN BATHYMETRY: MAPPING AND MEASURING

Learning Objectives:

- Be able to interpret 2D bathymetric contour maps as a 3D physical model (part I)
- Construct a 3-dimensional model of a feature on the ocean floor (part I)
- Simulate gathering depth data from an ocean vessel (part II)
- Draw a contour map from individual depth soundings (part II)

PART 2: MAPPING THE BATHYMETRY

Materials:

- Dowel or bamboo stick
- Ruler
- Graph paper
- Pencil

You will get a box that another student group created with a seafloor feature. Your job is to measure the seafloor through the lid (no peeking!) and then transfer that measurement onto the correct location on some graph paper. Finally, you will contour the bathymetry based on your discrete set of measurements.

Imagine you are steaming across the ocean in a research vessel and want to know the seafloor topography. You don't have any fancy mapping sonar, but you do have an echo sounder that allows you to make point measurements of the water depth directly under the vessel.

your research vessel navigation plan. Normal cruising speed is 10 kts. How will you probe the ocean floor, how long will it take, and how much will it cost? Sketch or describe your sampling plan here. Compute how long it will take, in hours.						
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2. Follow your ship's track and take depth soundings at each drill hole opportunity.

Using a bamboo skewer, stick it through a hole in the lid of the box. Make sure the stick is perpendicular! You may want to use something with a 90° corner (like a ruler) to help make sure it is vertical. Record your measurements on graph paper as you go. Use pencil.

Create a table with columns: x-position, y-position, stick length, (average) depth in meters. The stick length column could be repeated 3 times to evaluate uncertainty associated with your measurement method.

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3.	Draw	a	contour	map.

Remove your grid paper from the box. (You may want to duplicate measurements since it may take a couple tries to create a good contour map.). Draw the contours on your map to recreate the terrain in your box. Be sure to include contour labels on your contours, and include units (e.g. 'm' for meters).

- 4. **Cost.** Estimate how much your survey would cost, and how far your research vessel traveled. Use the following assumptions.
 - Your research vessel cruises at 10 kts (echo soundings take no time at all)
 - You work around the clock, 24-hour days
 - The ship costs €30.000 per day to run

• Steaming out to the research location and back to port is magic. It takes no time at all an is free.	d
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Based on practicals by Jessica Kleiss, Lewis & Clark College (https://nagt.org/nagt/teaching_resources/teachingmaterials/124130. html) and Bigelow (https://archive.bigelow.org/virtual/handson/fathometer.html).

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