



Chapter One: Measurement

- **3.1 Position, Coordinates, and Maps**
- **3.2 Topographic Maps**
- **3.3 Bathymetric Maps**

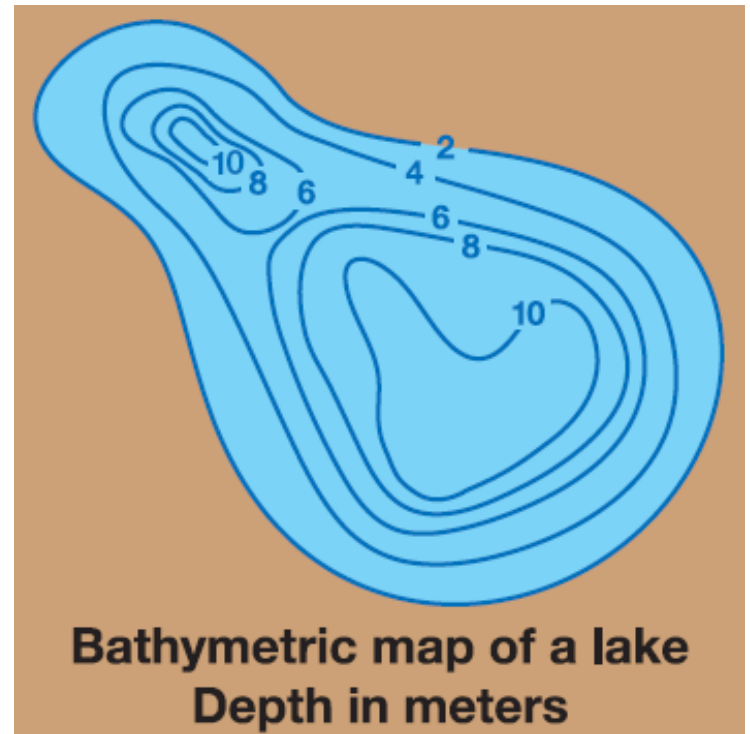


Section 3.3 Learning Goals

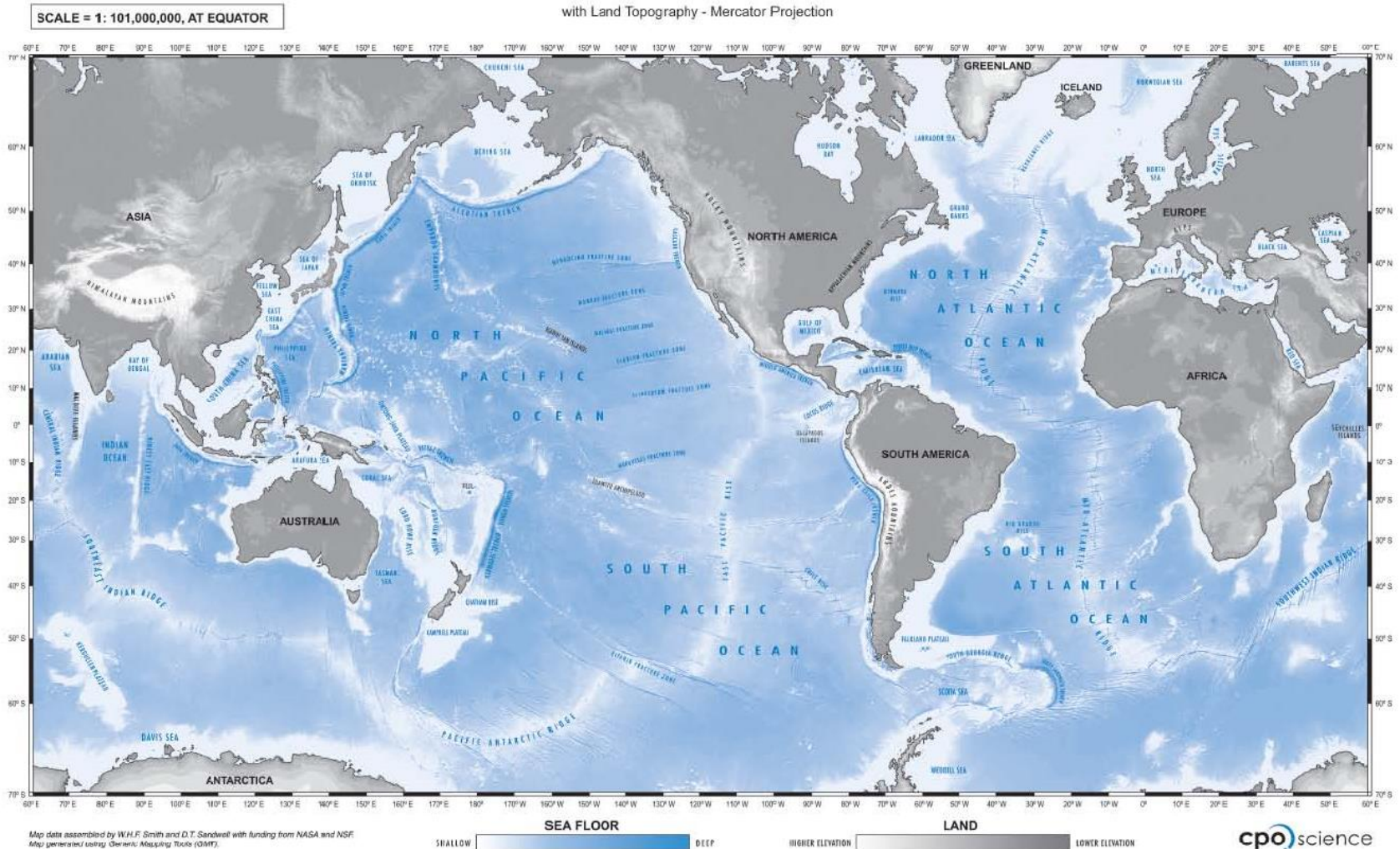
- **Discuss how depth is illustrated on a bathymetric map.**
- **Compare and contrast topographic and bathymetric maps.**
- **Explore the role of echo sounding in the construction of bathymetric maps.**

3.3 Bathymetric Maps

- A *bathymetric map* shows the depths of a body of water such as a lake or an ocean.
- Bathymetric maps use contour lines like topographic maps.



3.3 Showing depth





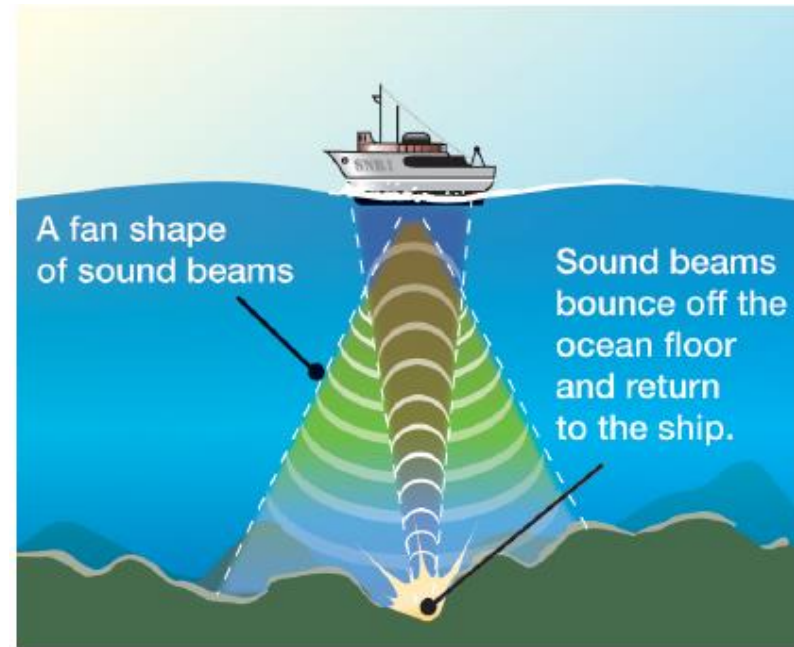
3.3 Technology and bathymetric maps

- **The average ocean depth is 3,711 meters (12,175 feet).**
- **The deepest place of all is the Mariana Trench) which is 10,923 meters (35,838 ft).**

Can you convert these distances into kilometers or miles?

3.3 Technology and bathymetric maps

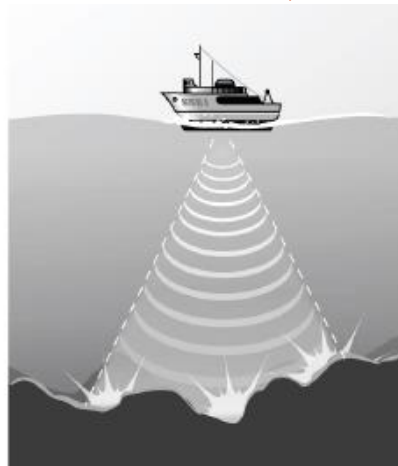
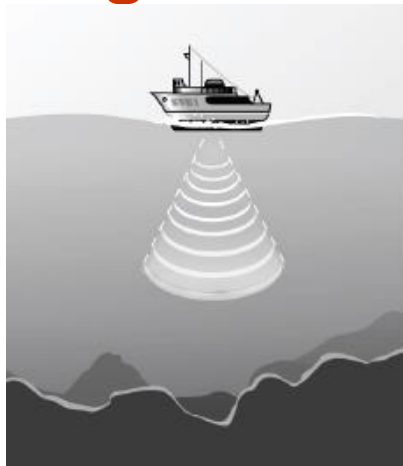
- Scientists measure these great depths using a technology called *echo sounding* or *sonar*.
- A device on a ship sends sound waves outward from the bottom of the ship.





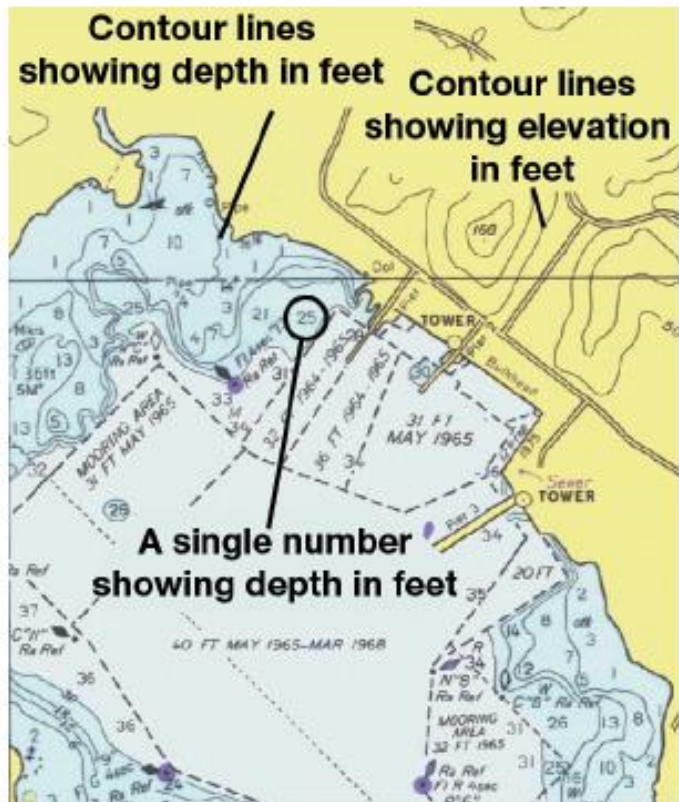
3.3 Technology and bathymetric maps

- Sound waves from the ship “echo” off the ocean floor.
- It takes time for the echo to return to the ship.
- The longer the echo time, the deeper the water!





3.3 Nautical charts



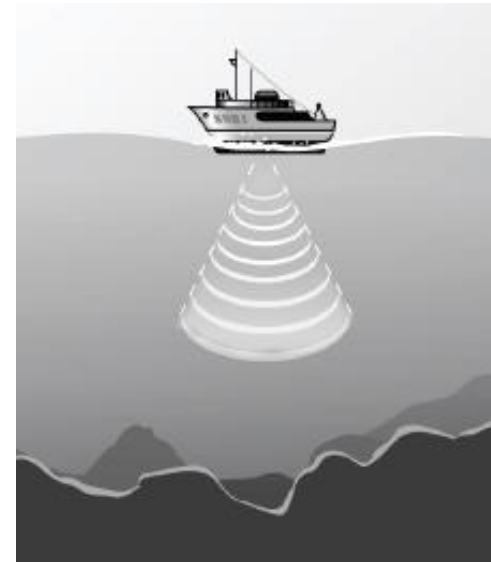
- Nautical charts are important tools for anyone interested in navigating bodies of water.
- Charts indicate hazards that can sink boats and show markers leading to channels.

Investigation 3C

Bathymetry of the Sea Floor

- ***Key Question:***

How can we tell what kinds of features are on the sea floor?





TECHNOLOGY ►► CONNECTION

Finding her way: Anna Shafer-Skelton

- **Orienteering is... map reading, problem solving, and cross-country running rolled into one .**
- **Anna Shafer-Skelton has been a part of the Saint Louis (Missouri) Orienteering Club since she was 7 years old.**

