Bathymetry
(Ocean Bottom Topography)
Bathymetry

Bathymetry is the topography (shape of the land) of the ocean floor.

– It is determined by the way the tectonic plates are moving or aligned.

– We map the ocean floor (and learn what features are there) by using sonar on ships travelling across the oceans.
How do they map the bottom?

• From ships using typically sonar
• Signal is sent out by the transmitter towards the bottom
• Return signal is recorded by the receiver to create a graph
• Graph is translated into a map of the bottom
Bathymetry – Ocean Floor Topography (Words to know)

• **Continental Shelf**- shoreline out to continental slope (flat)

• **Continental Slope** – shelf edge to where water depth increases rapidly (sediments build up temporarily, until they tumble down to form continental rise).

• **Continental Rise** – lies on ocean crust (part of ocean basin, not continent).

• **Continental Margin** – portion of the continent that contains the shelf, slope, and rise.

• **Abyssal Plain** – deep seafloor, flat
Bathymetry – Ocean Floor Topography (Words to know)

- **Submarine Canyon** – an underwater canyon (possibly an old river channel).
- **Mid-Ocean Ridge** – a divergent boundary (where plates are moving apart and new sea floor is forming).
- **Guyot** – flat topped seamount
- **Seamount** – pointed mount
- **Abyssal hill** – hills/mounds within the abyssal plain
- **Trench** – forms at subduction boundary, deep places on earth.
- **Volcanic Islands** – islands where volcanism is occurring, usually at a hot spot or subduction boundary.
General Vocabulary

Continental Shelf

- Border Continents – sand/mud, sometimes rocky outcroppings or a gravelly bottom
- Highly productive – covered with shallow water
- Varies from a few to several hundred miles deep
Continental Slope

- Marked by a steep gradient (between shelf & rise)
- Often bordered (especially in the Pacific) by trenches & scarred with canyons (often larger than the Grand Canyon)
- Sliding of sediment and mud downhill creates turbidity currents
General Vocabulary continued…

Continental Rise

- Blends slope gently into the abyssal plain
- Does not exist in all locations
- Marks the end of the continental margin
General Vocabulary continued…

Continental Margin

- portion of the continent that contains the shelf, slop, and rise.
- Can be active (tectonic plates are actively moving) or passive (no plates/no movement)

Which of these is an active continental margin???
Abyssal Plain

- Vast expanse of deep ocean floor with relatively slow-moving waters (flat & featureless); not common in the Pacific
- Thick, soft sediments ("rain" of organic particles)
- No plants….No Light for them!
- Temp. is consistent, not too low (no fluctuations are good)
- Bioluminescence, small eyes, poorly developed muscles, slow metabolism
Abyssal Hills

- Small oval-shaped hills formed from continental sediment piling up or covering rock masses
Seamount

- Isolated peaks that rise thousands of feet above the ocean floor
- Believed to be formed by volcanic activity
- Some reach above sea surface and form islands
Guyot

- Submerged, flat-topped seamount
- Sometimes sunken a bit
- Similar in appearance to a plateau
Mid-Ocean Ridge

- Continuous mountain range
- Usually submerged, but not always
- Most of Iceland is part of the Mid-Atlantic Ridge, that is above sea level
Trench

- Long, narrow cut with steep sides
- Most are relatively close to coastal areas
- Typically caused by subduction zones