

# Google Oceans

**Part I:** Open Google Earth. In the “Places” menu on the left, make sure everything is unchecked. In the “Layers” menu below that on the left, make sure the **ONLY** boxes that are checked is “Borders”, “Places” and “Terrain.”


- 1) Spin the Earth, and zoom in so that the United States takes up most of the screen. Observe the continental margin (the underwater edge of the continent) on the East coast. Describe what the East coast looks like compared to the West coast.
- 2) What is the name of this prominent feature off the East coast? \_\_\_\_\_
- 3) Is there a plate boundary present on the East coast profile? *How do you know?*
- 4) What type of continental margin (active or passive) is the East coast of the US? *How do you know?*
- 5) Type “Staten Island” into the search bar, and zoom into this location. You are now looking at the mouth of New York’s Hudson River. Zoom out a little bit, and follow the path of the river out into the Atlantic Ocean to the edge of the continental shelf. Look for something called “Hudson Canyon” underwater. Look at the bathymetry of the seafloor at this canyon. **Describe** how you think this canyon formed:
- 6) Now, zoom out and rotate the Earth so that you are looking at the western basin of the Pacific Ocean, near the Philippines. **Describe** what the seafloor looks like in this region. What prominent seafloor feature scars the seafloor east of the island of Guam, and what type of boundary is it a result of?
- 7) Locate New Jersey, and *zoom out enough so you can see the entire continental shelf*. Select the **Ruler** tool from the menu of icons at the top. Make sure the **units** in the drop-down menu are in **miles**. Click once on the coast of New Jersey and then click again straight out from there at the edge of the continental shelf. How far is it to the edge? Based on this, do you have to worry about reaching the edge of the shelf while swimming here?

**Length of Continental Shelf:** \_\_\_\_\_

- 8) Now enter “Challenger Deep” in the search bar. You are now looking at the deepest place on Earth – the bottom of the Mariana Trench. Move your cursor around until you find the **maximum** depth in this location. (You’ll see the elevation along the status bar at the bottom right of the window.) Record the depth here:

**Challenger Deep:** \_\_\_\_\_

**Part II:** Now you are going to more closely examine two different continental margins and determine if they are active or passive. It is very important that you follow the directions in each step below in order to be successful!

- A. Go to Ocean City, NJ, but zoom out enough so that you can see most of the US east coast and a good portion of the abyssal plain.
- B. In the menu of icons at the top, select the one that says "Add Path."  (You may need to shrink down the window that pops up)
- C. Select the "Altitude" tab in the window that opens, and **change the Altitude to "Clamped to sea floor." THIS STEP IS CRUCIAL!**
- D. **Without closing this window, click and drag** from the edge of the coast out into the abyssal plain. You must start on the edge of the land. You should see a line created. Now click "OK" to close the window.
- E. In the "Places" menu to the left, you should see something called "Untitled Path." This is the path you just created. **Right-click** on this, and select "Show Elevation Profile." You will now see the profile of the path you just created pop up below the map.
- F. To get a more accurate profile, zoom in on the path (white line) and move the screen across it. You will notice your profile become more accurate as you do this. Now zoom back out so you can see the entire line you created.



- 1) Sketch the profile you just created in the box below. **Label** any features that are present (continental shelf, continental slope, etc.). Use your notes to help you if needed.

US East coast profile

- 2) Move your cursor across the profile. You will notice a red arrow moving on the map across the line you created as you do so. The negative number above the arrow is the depth. Select five different spots on the profile you sketched above, and add their depths to your sketch.
- 3) Is this an active or a passive margin? How do you know?
- 4) Close the elevation profile window at the bottom. Now use the search bar to locate "Tarapaca" in Chile, South America. Zoom out enough so that you can see most of this region and a good portion of the abyssal plain. **Repeat steps B through F above** to create a new sea floor profile. Sketch the profile you just created in the box below. **Label** any features that are present (continental shelf, continental slope, etc.).

South America West coast profile

- 5) Move your cursor across the profile. You will notice a red arrow moving on the map across the line you created as you do so. The negative number above the arrow is the depth. Select five different spots on the profile you sketched above, and add their depths to your sketch.
- 6) Is this an active or a passive margin? How do you know?
- 7) Compare the two profiles you created in Part II. Identify some differences between them. Be sure to include the words "subduction" and "tectonics plates" in your answer.