
PART 1: B_Giant Landslides

At the end of the activity, each group member will turn in:

1. One completed map outlining Giant Landslides around the Main Hawaiian Islands.
2. One completed map outlining Giant Landslides around part of the Northwestern Hawaiian Islands.
3. Completed questions below.

Overview

- With your group you will look at a map of O'ahu and answer questions below.
- Then, after checking your results with the instructor, with your group you will try to outline potential Giant Landslide deposits around the Main Hawaiian Islands and answer several questions.
- Then try to outline potential Giant Landslide deposits around part of the Northwestern Hawaiian Islands and answer several questions.

Directions and Questions

MAIN HAWAIIAN ISLANDS

1) On the full wall map, look at the seafloor bathymetry extending northeast of O'ahu and north of Moloka'i offshore 100 km, and the shapes of the islands above sea-level.

What elevated **submarine** features (like seamounts, hills or other bathymetric features that rise from the base of the seafloor) provide evidence for what may have happened to the shield volcanoes on these islands? How far do these elevated landforms extend (in km) from northeast O'ahu?

—Describe the shapes of the elevated submarine features. What does that tell you about how they may have formed?

2) What are **THREE** of the most convincing **submarine or subaerial** characteristics of the island of O'ahu and the surrounding seafloor that indicate what may have happened to parts of the two shield volcanoes on the island of O'ahu during or after their formation? If O'ahu formed between 4-2 Myr ago, approximately when do you think these features extending offshore formed?

4) Looking at the full-size wall map, **how many** giant landslide deposits can you identify around the Main Hawaiian Islands? Try to outline giant landslide deposits on your 8x11 inch map.

3) *Check with your Instructor* to see a map with landslides labelled, to see how you did before trying to indicate the type of each Giant Landslide deposit around the Main Hawaiian Islands. Look at the two 8x11 inch maps provided by your instructor, one of landslides around the Main Hawaiian Islands and one with landslides around O'ahu.

4) Using at the 8x11 inch map provided by your instructor of the Main Hawaiian Islands with the Giant Landslides outlined in white dashed lines, and referring to the large full-size wall map, indicate (by labelling on the map) the type of landslide deposit as **debris avalanche (fast-moving landslide)** or **slump (slow-moving landslide)** for each outlined Giant Landslide based on the characteristics of each deposit and comparing them to the deposits around O'ahu.

—Describe key differences between the morphology of the debris avalanches and slumps.

NORTHWESTERN HAWAIIAN ISLANDS

5) Look at the map provided of Gardner Pinnacles and Maro Reef. With your group members **try to outline** potential areas of Giant Landslides around Gardner and Maro Reef on the map. Do you see evidence of any other potential Giant Landslide deposits around the other Northwestern Hawaiian Islands on the full-size wall map? Indicate the type of landslide deposit (debris avalanche or slump) for each outlined Giant Landslide around Gardner Pinnacles and Maro Reef based on the characteristics of each deposit.

6) **Summarize your observations** about the topographic features of Giant Landslide deposits along the Hawaiian Ridge in several sentences below. List **TWO** specific possible **explanations** for the possible causes for Giant Landslides in the Northwestern and Main Hawaiian Islands. Be prepared to share your findings with your next group.



