

The Samoan Hotspot:

A hotspot is an area deep in the mantle where molten magma plumes rise upward, melting the crust above, and fueling volcanic eruptions on the overlying crust.

Mantle plumes are relatively stationary, but the Earth's crust moves slowly — at about the same speed your fingernails grow. As a result, hotspots form linear chains of volcanoes with the youngest closest to the hotspot and the oldest farthest away.

Exploring underwater volcanoes can help us learn about processes deep inside the planet. Collecting and analyzing seafloor rocks helps geologists learn when and how seamounts were formed. Researchers can study the movement of tectonic plates by finding patterns in hotspot volcanoes and retracing related seamounts back to hotspots over time.

Hotspots are unique because they form volcanoes within the interior of a tectonic plate rather than at its edges.

Over millions of years, the Pacific Plate has drifted westward over the Samoan Hotspot, generating the islands and underwater mountains of the Samoan Archipelago. Today, the Samoan Hotspot is beneath Vailulu'u — the only active underwater volcano in American Samoa.

A hotspot is fed by a region deep within Earth's mantle where heat rises through the process of convection.

The seafloor underlying the Pacific Ocean is dotted with hotspots, which have created over 50,000 seamounts.

