



Where Is The Volcano, Where Is The Summit?

We only see 7% of Haleakalā, the third largest mountain and or volcano on this planet, above water. The other 93% is underwater, so you landed on the volcano at the airport.

Look at the bottom of this diagram and you’ll see it starts on the ocean floor. In the Hawaiian islands, there is always a volcano under your feet, even if there is sand, concrete or carpeting between you and the rock.

Where Did It Erupt From?

Not always from the “top.” These types of volcanoes have multiple eruption sites, often concentrating in a corridor, line, or “rift zone,” which runs from the ocean floor to the summit. Eruptions can happen anywhere, at any elevation, but they tend to concentrate along these rift zones. When you’re in ‘Āhihi-Kīna‘u Natural Area Reserve, face east looking up the mountain. To your far left (north) is the cinder cone at Makena State Park (Pu‘u ōla‘i) and behind you (west) is the islet of Molokini in the channel: each of these hills and flows, either underwater or going up into the clouds, are eruption sites along the southwest eruptive zone of Haleakalā.

Why Did You Plow It All Up?

This is just how it flowed. Hawaiian magmas can hold and keep high temperatures. At the surface these lavas may tear and fold as they cool, making flows look rough or “plowed,” or they can flow and cool to look “smooth.” Many flows show both extreme textures and everything in between. Except for the road and parking lot, you are seeing this place exactly as the volcano made it.



Are These The Most Recent Flows On Maui?

In the reserve, you’re standing on two flows that made the peninsula of ‘Āhihi-Kīna‘u, and they are the youngest flows of Haleakalā. The dark cone to the right (when facing east) is Kālua o lapa, the youngest at about 500 years old. The Kanahena Flows, directly in front of the parking lot, are about 600 years old. But this area only gets about 15 inches of rain a year. Compare that to the second youngest flow on Maui, on the wet side of the island, near the town of Hāna. Its called Pu‘u o Kahaula, and is roughly 700-800 years old. Its covered in trees because it gets about 250 inches of rain a year.



Base of Haleakalā:
20,000 Feet Underwater



artwork:GM

Hot Spot Versus Composite Volcanoes

Famous volcanoes such as Japan’s Fugiyama, Aoraki (Mt Cook) in New Zealand, Pinatubo in the Philippines, Louwala-Clough (Mt St Helen) in the US, and more are all composite volcanoes, formed at the boundaries of the Pacific plate. Together they are the “Pacific Ring of Fire.” Their magmas, made from crustal rock itself, erupt violently because they are relatively cool and stiff. But Hawai‘i sits in the middle of the Pacific plate. Here, as in a few other places on Earth, a magma plume from deep in the mantle rises-up and melts through the crust: these are hot spot volcanoes. They can grow tens of times larger than composites because their magma is hotter and melts through to the surface less violently.

Hawaiian Islands Are Born, Erode, Then Disappear Underwater

A chain of underwater mountains travels from today’s Hawai‘i to the Kamchatka Peninsula, the northwest edge of the Pacific plate, and all those submerged islands share the same rock-chemistry. That means this hot spot volcano has been making islands at this longitude and latitude for at least 90 million years. Like the other pieces of Earth’s crust, the Pacific plate moves, and it travels to the northwest a few centimeters each year, passing over this stationary magma plume. So a chain of islands is built, with the youngest and largest to the southeast, and the oldest and smallest to the northwest, until time and tide erodes each island below the waves again.

There’s No Such Thing As Barren or Desolate

A community of insects and spiders, many species found only in Hawai‘i, live hidden from the daylight’s harsh sun and dry winds in the loose rock and cinders under your feet. Even seabirds use new volcanic flows to build nests in underground burrows. Walking on young flows crushes cavities beneath your feet, both large and small, trampling unique life forms we cannot see in the daytime.



During an island’s lifetime above the waves, it becomes host to:

Anchiline pools are unique ecosystems found only near the ocean in young lava flows. They are formed when fresh water pools and mixes with saltwater that percolates through cracks in lava flows. Some species adapted to live in them are unique to Hawai‘i. The reserve protects more of these special pools than anywhere else on Earth. Learn more about them at <http://dlnr.hawaii.gov/ecosystems/nars/anchialine>



Young lava flows are not desolate. On the dry side of the islands, these flows challenge a group of well-adapted plants which then host other species. Learn more about **Hawaiian dryland forests** at <http://dlnr.hawaii.gov/ecosystems/nars/drylandforests>



In the ocean, lava creates solid surfaces where young corals can anchor and build. Above high tide, lava filters out sediments flowing to the ocean after rains. Corals are the “trees of the underwater rainforest.” Learn more about **coral reefs** at <http://dlnr.hawaii.gov/ecosystems/nars/coral>



In this desert, ancient village sites are often found near or following lava tubes. Brackish or fresh water may flow today in these arteries which were first built by lava flows.

Learn more about **Hawaiian archeology** at <http://dlnr.hawaii.gov/dsp/archaeology-history/>



Dig even deeper into **geology and Hawaiian Volcanism** at the United States Geologic Service website: <https://volcanoes.usgs.gov/observatories/hvo/>

Remember: Take Only Photos and Memories

It is unlawful to take rocks, shells, wood or any natural item from natural area reserves. (HAR§ 13-209-4)

Leave the Rocks and Coral Where Nature and History Placed Them. Stacking or moving rocks is vandalism and is culturally disrespectful because you may disturb archeological sites. (HAR§ 13-209-4)

