Huge chunk of O‘ahu broke off a million years ago

Geologists track the path of large undersea landslides

By Rod Thompson ,
Big Island correspondent
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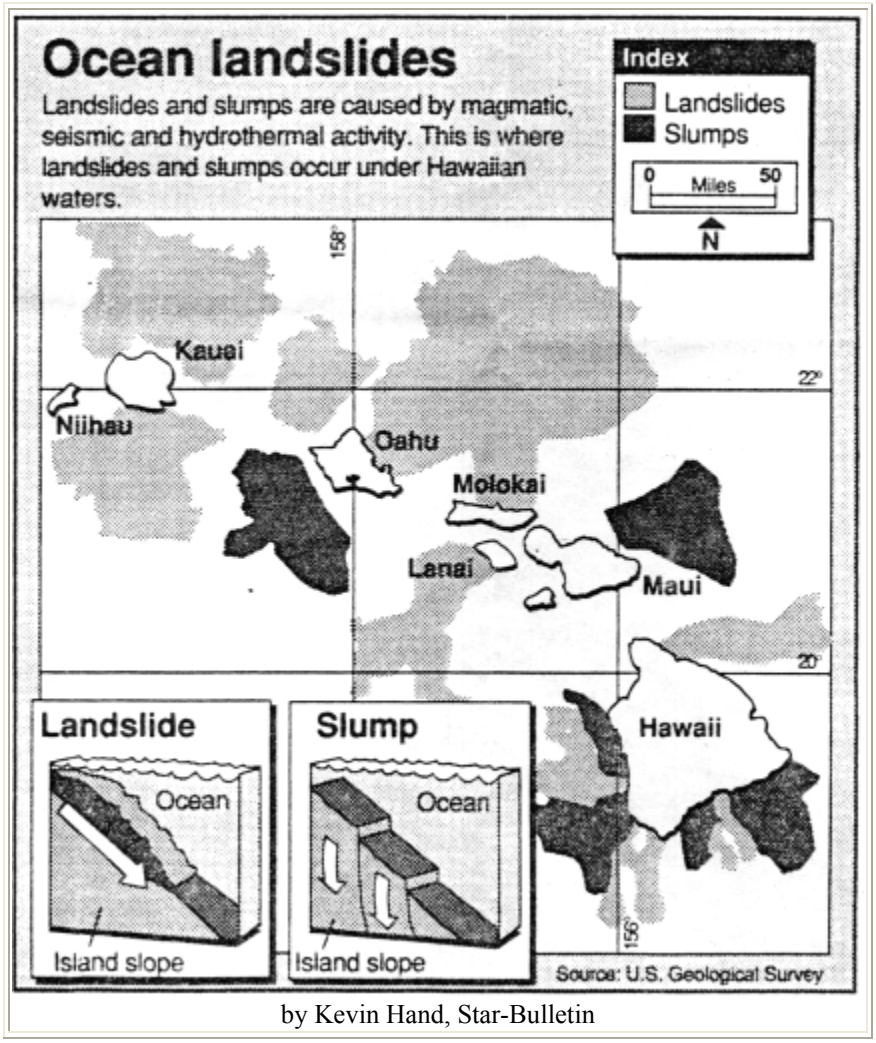
MAP OF ISLANDS (WHITE), AND PIECES THAT FELL OFF THEM IN HUGE AVALANCHES



by Kevin Hand, Star-Bulletin

O‘ahu used to be nearly twice as big as it is now before a massive earthquake broke off the windward side of the island and dumped it in the sea over a million years ago, scientists have discovered.

In fact, enormous pieces of all the Hawaiian Islands have broken off at least 17 times in its 5 million-year geologic history, scientists say.

The huge natural disasters produced undersea landslides that strewed thousands of cubic miles of rock over 40,000 square miles of sea floor roughly six times the land area of the Hawaiian Islands.

These "prodigious submarine landslides," as scientists call them, were discovered in 1988.

Using a special sonar (a sound wave machine to find exactly how deep it is), the scientists were able to map loose blocks of volcanic rock as much as 3 miles below sea level. Mapping the areas back to their source showed that the blocks had been gouged out of the islands.

The largest landslide, dubbed the "Nuuanu debris avalanche," extends 140 miles out to sea from Windward Oʻahu. In the middle of it, 60 miles northeast of Nuuanu Pali, is Tuscaloosa Seamount: 19 miles long, 11 miles wide and more than a mile thick. This single rock, with a volume of 230 cubic miles, was once part of Oʻahu.

These landslides occur during volcano building, Moore said. When magma rises from deep in the Earth into young, steep mountains, the mountain sides sometimes just fall into the sea.

When the piece of Oʻahu destined to become the Tuscaloosa Seamount broke free over a million years ago, it was just part of 1,200 cubic miles of Oʻahu that went with it.

The mass of rock roared down the submarine slope three miles to the bottom of the trench that surrounds the islands. The new seamount got stuck there, but smaller pieces, some as big as a half-mile long, kept moving as far as 140 miles from Oʻahu. Most of the landslide discoveries must have happened in a single event.

A similar massive avalanche from the north shore of Molokai took place 1.4 million years ago. The Nuuanu slide must be older than that because the Molokai debris rolled over the top of it, he said.

Moore suggested that massive landslides produce huge tsunamis. This could explain some out of place gravel found at 1,200 feet on Lanai – a 1,000-foot-high tsunami could have carried it there. The 105,000 year-old gravel was washed up by a wave from an avalanche originating near Milolii in South Kona. A huge undersea landslide there points directly at Lanai, scientists discovered.

Are these discoveries amazing but irrelevant to modern life, or are they cause for concern?

Geologist Wright says the huge landslides are too rare to worry about. "A quarter of a volcano sliding off is not something that can be responsibly projected as a hazard in a lifetime," he said. But the slides come in medium and small sizes, too, and Wright thinks people should think about where new construction sites go.

STUDENTS! CHECK OUT THIS WEBSITE FOR THE MAP A SUBMARINE USES TO TAKE TOURISTS AROUND THE OCEAN FLOOR IN FRONT OF WAIKIKI:
http://www.atlantissubmarines.org/oahumap.pdf