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Fact Sheet | “Yellowbrick Road”

Expedition Name: [Lu‘uaeaahikiiekumu](#) - Ancient Seamounts of Lili‘uokalani Ridge [NA138]

Date Seen: 4/23/2022

Depth Seen: 1029m

Dive Number: H1924

Location: Near the summit of Nootka Seamount inside the Papahānaumokuākea Marine National Monument

Sighting information:

During a three-week expedition, within Papahānaumokuākea Marine National Monument (PMNM), a team of scientists, engineers, educators, students, and professional mariners spotted something unique on the seabed using remotely operated vehicles.

At the summit of Nootka Seamount, the team spotted what initially looked like a "dried lake bed" formation. Upon closer review, geologists now ID the unusual pavement as a fractured flow of hyaloclastite rock. Hyaloclastite rock is a volcanic rock formed in high-energy eruptions where many rock fragments settle to the seabed. The unique 90-degree fractures are likely related to heating and cooling stress from multiple eruptions at this baked margin.

Geometric fractures form in many seabed rocks, including cases where lava breaks into geometric hexagonal patterns. This rock type surprised the team with how different it looked from more commonly seen pillow basalts, rounded dark-colored structures found widely across the Pacific, and Nootka Seamount formed by ancient underwater volcanic eruptions.

Nootka Seamount is a 3600m tall underwater mountain — aka seamount. This seamount chain is estimated to be 80-100 million years old, making it older than the Northwestern Hawaiian Islands, though determining more specific ages and information about the formation of these sites, was one of the goals of this expedition.

Expedition Lu‘uaeaahikiiekumu led by [Ocean Exploration Trust](#) visited PMNM to conduct the first-ever visual exploratory surveys of the Lili‘uokalani Ridge Seamounts to investigate a puzzling split in the seamount trail. This seamount is located over 950 miles northwest of Honolulu, Hawai‘i, and ~200 miles north of Kamole (also known as Kauō or Laysan Island).

Exploration provides opportunities for researchers to take a deeper look at life on and within the rocky slopes of these deep, ancient seamounts which help provide baseline information on the living communities of seamounts which can inform management and conservation measures.

Video:

<https://nautiluslive.org/video/2022/04/29/follow-yellow-brick-road-geologic-features-liliuokalani-ridge-seamounts> Or embed from YouTube: <https://www.youtube.com/watch?v=TID2kc8yb9Q>

Quotes from Lead Scientist Dr. Val Finlayson

- “We never know exactly what we’ll find when we survey unexplored volcanoes.” - Dr. Val Finlayson, Lead Scientist of Lu‘uaeaahikikekumu and Post-Doctoral Researcher at University of Maryland
- “We’re lucky enough to be able to use unexpected observations like this “Yellow Brick Road” to learn a little bit more about submarine volcanoes work, and how to identify and interpret different features that we wouldn’t see with other kinds of sampling expeditions that don’t use ROVs.” - Dr. Val Finlayson, Lead Scientist of Lu‘uaeaahikikekumu and Post-Doctoral Researcher at University of Maryland
- “There’s so much more to learn about the deep ocean - the more we dive, the more we learn, the more we can look for unusual geological features, deep sea animal species, and how these ecosystems work and thrive and how we can be good stewards of the oceans.” - Dr. Val Finlayson, Lead Scientist of Lu‘uaeaahikikekumu and Post-Doctoral Researcher at University of Maryland

Expedition Information:

<https://nautiluslive.org/blog/2022/04/07/luuaeaahikikekumu-exploring-ancient-volcanoes-liliuokalani-ridge>

The expedition was made possible by many partners including all PMNM co-trustees: the Department of Commerce, the Department of the Interior, the State of Hawai‘i, and the Office of Hawaiian Affairs. The expedition was funded by NOAA Ocean Exploration via the Ocean Exploration Cooperative Institute and NOAA Office of National Marine Sanctuaries.

Ocean Exploration Trust/ Exploration Vessel *Nautilus* Fact Sheet: [2022 OET Nautilus Fact Sheet](#)
General *Nautilus* and ROV topside imagery available here: <https://nautiluslive.org/pressroom>

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