USGS HAWAIIAN VOLCANO OBSERVATORY

INFORMATION STATEMENT FOR TA‘Ū VOLCANO AND THE MANU‘A ISLANDS, AMERICAN SAMOA: August 17, 2022

Summary:

The earthquake swarm in the Manu‘a islands of American Samoa continues without significant changes. Approximately 20 earthquakes per hour are being recorded by the two microseismometers installed in the Manu‘a islands; most events are too small to be felt. Estimated magnitudes of the largest earthquakes, including the felt events, are between magnitude 2 and 3. Seismic data indicate that the source for these earthquakes is beneath the Manu‘a Islands, likely closer to Ta‘ū island rather than Ofu-Olosega, and are not related to Vailulu‘u seamount.

Observations and Reports:

- **There were no significant changes overnight and conditions remain the same as reported on Tuesday, August 16, 2022.**
- Approximately 20 earthquakes per hour have been occuring for the past 3 days, this is down from 30-40 earthquakes per hour on August 14th when the Ta‘ū seismometer was first installed. Earthquakes are now being automatically counted so changes in activity can be rapidly tracked.
- Satellite data from the past 24 hours showed fairly clear views and no signs of volcanic activity.
- Residents of the Manu‘a group of islands in American Samoa continue to feel earthquakes. Residents reported that earthquakes began about 3 weeks ago, with the first felt earthquake report from July 26th.
- Reports from both Ta‘ū and Ofu-Olosega islands suggest that the earthquakes vary in intensity, but are generally short, sharp jolts. The earthquakes are more likely to be felt by people indoors at rest and along the coast, where buildings sit on sediment that amplifies shaking. These factors are probably responsible for the variability in reporting.

Upcoming Change in Communication:

Volcanoes in the Manu‘a islands have not previously been monitored and were classified as unassigned in the US Geological Survey’s Volcano Alert System. (https://www.usgs.gov/programs/VHP/volcanic-alert-levels-characterize-conditions-us-volcanoes)

Establishment of seismic monitoring shows that the level of earthquake activity is well above NORMAL (Green) and that the appropriate level should be ADVISORY (Yellow). On Friday, August 19, the USGS will be switching both Ta‘ū and Ofu-Olosega volcanoes to ADVISORY (Yellow) status if conditions remain the same. This change in Alert Level will be communicated in a Volcano Activity Notice (VAN) that establishes the new level of activity. After the volcano alert-level changes, Daily Updates will be issued for Ta‘ū Island instead of Information

Statements. To subscribe to receive VANs and Updates, see STAY INFORMED at: https://www.usgs.gov/volcanoes/ta-u-island

Analysis:

The earthquake activity detected by seismometers and reported to date suggests a source local to the Manuʻa islands, likely closer to Taʻū island than to Ofu-Olosega or Vailuluʻu seamount. The current estimate is approximately 20 earthquakes per hour, with most too small to be felt.

Due to limited earthquake monitoring equipment, the exact location, depth and magnitude depth of these earthquakes is currently unknown.

Not all earthquake swarms on volcanoes result in eruptions. Current low-level earthquake activity may continue and vary in intensity for days to months or longer without an eruption. It is also possible that the swarm is an early precursor to an eventual eruption. At this time, we cannot determine which of these possibilities is more likely. A large explosive eruption similar to the Tonga eruption earlier this year is extremely unlikely.

Scientists are also investigating reports of other activity provided by local residents, which are appreciated. Several residents have reported booming noises associated with felt earthquakes. Booming noises could have a number of natural and man-made sources including rockfalls, ground cracking, volcanic noise, and human caused events. Scientists will be deploying instruments in the coming weeks to capture and analyze noises in the region.

Response:

Experts at the Pago Pago National Weather Service Office (NWS), U.S. Geological Survey (USGS) Volcano Hazards Program, NOAA Pacific Tsunami Warning Center, NOAA-IOC International Tsunami Information Center, and USGS National Earthquake Information Center are working together with the local authorities in American Samoa to understand the source of these earthquakes. These agencies are working together to install monitoring stations so earthquake locations and magnitudes can be more precisely determined.

USGS Hawaiian Volcano Observatory (HVO) staff have been in Pago Pago since August 11 and are consulting with local authorities. Additional HVO personnel and permanent seismometers for earthquake detection are expected to arrive in American Samoa later this week.

Monitoring:

American Samoa's volcanoes are monitored for earthquakes by a microseismometer in Fitiʻuta village on Taʻū island, a microseismometer in Olosega village on Ofu-Olosega island, and a more distant global seismic station in Apia, Samoa. The sparse monitoring stations may not allow for advanced warning of new activity.

Remote sensing satellite data is also being used to monitor American Samoa for events potentially related to volcanic activity, such as thermal anomalies, volcanic plumes, or volcanic gases. This monitoring is being done by USGS Alaskan Volcano Observatory scientists and the Wellington Volcano Ash Advisory Center (VAAC).

Residents can assist these monitoring efforts by noting and reporting accurate times that they feel earthquake shaking, hear unusual noises, or see changes that might be volcanically related to either the Pago Pago National Weather Service Office (https://www.weather.gov/ppg/wsopagooffice) or the American Samoa EOC in Pago Pago (684-699-3800).

Hazards:

Currently, the primary hazard of concern is earthquake shaking. For information on how to prepare for an earthquake, see: https://www.usgs.gov/faqs/what-can-i-do-be-prepared-earthquake.

If you feel shaking and are not near the coast, immediately drop, cover, and hold on until the shaking stops.

If you are at the coast, heed the natural tsunami warning signs. If you feel a strong or long-duration earthquake, see a sudden rise or fall of the ocean, hear a loud roar from the ocean, or see a large aerial plume from an eruption, a tsunami may follow, and you should immediately move to higher ground.

A submarine volcanic eruption or landslide can generate a tsunami. The PTWC will issue a warning if they detect earthquake activity that is likely to cause a tsunami. However, volcanic eruptions do not usually generate large enough earthquakes to warrant a tsunami warning. If there is a tsunami from a nearby volcanic eruption, residents of the Manuʻa islands and elsewhere in American Samoa are more likely to experience natural warning signs before receiving an official tsunami warning.

Tsunami information:

- Subscribe to U.S. Tsunami Warning Center: https://www.tsunami.gov/?page=productRetrieval
- National Weather Service Pago Pago Office: https://www.weather.gov/ppg/wsopagooffice
- Pacific Tsunami Warning Center: https://tsunami.gov/
- International Tsunami Information Center and American Samoa Tsunami Awareness Information: http://www.tsunamiwave.org
- Protecting yourself and your family from tsunami: https://www.weather.gov/safety/tsunami
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It is unclear if this unrest will escalate to a volcanic eruption. An eruption could pose significant hazards to residents of American Samoa; these hazards include volcanic gases, low-level localized explosions of lava, lava flows, earthquake shaking, and tsunami. Information about these hazards, which are similar to those in Hawaii, can be found at this HVO website: https://www.usgs.gov/observatories/hvo/hazards.

Background

Taʻū Island is located at the east end of the Samoan Islands, in American Samoa. It is the top of a large shield volcano, most of which is below the ocean surface. Taʻū, as well as Ofu-Olosega

islands, are located on the crest of the Samoan Ridge, a predominantly submarine feature formed from volcanic activity associated with the Samoa hotspot. A vent that erupted between Taʻū and Ofu-Olosega in 1866 could have been related to either volcano. Vailuluʻu is a submarine volcano located about 25 miles (40 km) to the east of Taʻū island. It has erupted multiple times during the past 50 years.

- Taʻū Island website: https://www.usgs.gov/volcanoes/ta-u-island.
- Volcanoes in American Samoa website: https://www.usgs.gov/observatories/hvo/volcanoes-american-samoa.

Contact

askHVO@usgs.gov

- Subscribe to these messages: https://volcanoes.usgs.gov/vns2/
- Summary of volcanic hazards from eruptions: https://www.usgs.gov/observatories/hvo/hazards
- Recent earthquakes in Hawaiʻi (map and list): https://www.usgs.gov/observatories/hvo
- Explanation of Volcano Alert Levels and Aviation Color Codes: https://www.usgs.gov/programs/VHP/volcanic-alert-levels-characterize-conditions-us-volcanoes

The Hawaiian Volcano Observatory is one of five volcano observatories within the U.S. Geological Survey and is responsible for monitoring volcanoes and earthquakes in Hawaiʻi.