

USGS HAWAIIAN VOLCANO OBSERVATORY

TA'Ū ISLAND INFORMATION STATEMENT REGARDING FELT EARTHQUAKES IN AMERICAN SAMOA: August 13, 2022

Synopsis:

No significant changes over the past 24 hours. Earthquake swarm in the Manu'a islands of American Samoa continues, most likely related to either Ta'ū volcano or the nearby submarine Vailulu'u volcano. Summary:

- **There were no significant changes overnight and conditions remain the same as reported on Friday August 12, 2022.**
- Residents of the Manu'a group of islands in American Samoa continue to feel earthquakes, with two felt earthquakes reported overnight. Reports from National Park of American Samoa staff and Ta'ū residents suggest that the activity began on July 26th. Since August 10th, earthquakes have also been reported by residents of Ofu and Olosega islands.
- Reports 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.
- Based on the reports, these earthquakes are probably related to either Ta'ū or Vailulu'u volcanoes. Scientists plan to install additional instruments to monitor earthquakes and other activity in the coming week.

Analysis:

The earthquake activity reported to date suggests a local volcanic source.

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

Not all earthquake swarms result in eruptions. Current low-level earthquake activity may continue and vary in intensity for days to months 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.

Volcanoes in American Samoa are similar to those in Hawaii. If activity escalates to an eruption, it will most likely include slow-moving lava flows or low-level explosions of lava that are localized to a small area. An eruption like Hunga Tonga–Hunga Ha'apai in Tonga earlier this year is extremely unlikely as it is a different type of volcano. Volcanoes in Tonga erupt much more explosively than ones in American Samoa and Hawaii.

Scientists are investigating earthquakes and reports of other activity.

Reports of exposed coral along the coast in the Manu'a islands were investigated yesterday (August 12) and found to be correlated of a King Tide currently affecting American Samoa. Shallow exposed coral reefs on Tutuila were also reported by NOAA National Marine Sanctuary staff during the day time low tide that occurs between 12 pm and 1 pm. USGS and other scientists will continue to investigate the event reported from Ta'u to confirm its origin. King Tides are more extreme than normal tides and thus may expose areas along the coast that are not exposed during a typical tide. Several residents of Ta'u reported loud booming noises on Wednesday night, August 10; no other noises have been reported since. Booming noises could have a number of natural and man-made sources including rockfalls, ground cracking, volcanic noise, and human caused events. USGS HVO scientists will be deploying infra-sound microphones in the coming weeks to capture and analyze noises in the region.

Response:

Experts at the Pago Pago National Weather Service Office, 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 American Samoa EOC to understand the source of these earthquakes better. The Samoa Meteorological Service is also reporting increased seismicity south or east of Tutuila Island.

Dr. Natalia Deligne of the US Geological Survey Hawaiian Volcano Observatory (HVO) arrived on August 11 in Pago Pago and is consulting with local authorities on the situation. Today, she is traveling to the Manu'a islands with local authorities to meet with residents and install earthquake-monitoring instruments. Additional HVO personnel and earthquake detection instruments are expected to arrive in American Samoa next week. Dr. Charles McCreery, Director of the Pacific Tsunami Warning Center, will arrive next Monday to advise tsunami concerns.

Currently, American Samoa's volcanoes are monitored remotely by satellites and a distant seismic (earthquake detection) station in Apia, Samoa. These instruments might detect significant explosive activity in American Samoa, but the lack of ground-based monitoring stations at the volcanoes does not allow for advanced warning of new activity. With the existing real-time earthquake-monitoring network in American Samoa, the earthquakes' locations and magnitudes cannot be precisely determined. HVO scientists plan to install additional earthquake monitoring instruments in the coming weeks.

Residents can significantly assist these monitoring efforts by noting and reporting accurate times that they feel earthquake shaking to either the National Weather Service Office (<https://www.weather.gov/ppg/wsopagooffice>) or American Samoa EOC in Pago Pago (684-699-3800).

HVO will issue information statements daily. Additional messages may be issued as needed.

Background:

Ta'ū is a shield volcano with rift zones to the northeast and northwest; the last eruption of Ta'ū occurred in 1866 as a submarine cone that formed between Ta'ū and Ofu-Olosega islands.

Vailulu'u is a submarine seamount whose summit is about 1970 feet (600 m) below sea level. The last eruption of Vailulu'u was in 2003, during which a cone formed within the summit caldera.

Hazards:

It is unclear if this unrest will escalate to a volcanic eruption. Volcanic hazards associated with eruptions in American Samoa could include volcanic gases, low-level explosions of lava localized to a small area, 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>.

A submarine volcanic eruption or landslide can generate a tsunami. The Pacific Tsunami Warning Center 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 Manu'a islands and elsewhere in American Samoa are more likely to experience natural warning signs before receiving an official tsunami warning.

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.

Here is information on what you can do to protect yourself and your family if you see a tsunami or receive a warning: <https://www.weather.gov/safety/tsunami-during>.

Additional information will be provided as it becomes available.

More information:

- Subscribe to USGS Volcano Notification Service: <https://volcanoes.usgs.gov/vns2/>
- National Park of American Samoa: <https://www.nps.gov/npsa/index.htm>
- Protecting yourself and your family from earthquakes: <https://www.usgs.gov/node/277816>
- Smithsonian Institution Global Volcanism Program webpage on Ta'ū Island: <https://volcano.si.edu/volcano.cfm?vn=244001>
- Smithsonian Institution Global Volcanism Program webpage on Vailulu'u: <https://volcano.si.edu/volcano.cfm?vn=244000>

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>

How you can help scientists:

Contact askHVO@usgs.gov if you have information or observations to share, such as times and types of earthquake shaking, steaming ground, discolored or steaming water, unusual changes to the ground surface, ocean, or new large areas of dead vegetation or wildlife. These are most useful if you include time and location of the observation plus a photo or video with scale, if possible, that shows what you see. A person, boat, house, or tree can provide scale. Only take a photo or video if it is safe to do so.

Stay informed:

The U.S. Geological Survey (USGS) Hawaiian Volcano Observatory will be sharing information about unrest in American Samoa via the USGS Volcano Notification Service (VNS) in addition to the existing website.. This free service sends notices via email about volcanic activity in the US.

Subscribe to the VNS at <https://volcanoes.usgs.gov/vns2/>. For emails about American Samoa unrest, select Ofu-Olosega, Ta'u Island, and Tutuila Island from the list of available volcanoes. Alternatively, select "Hawaiian Volcano Observatory - Add All Volcanoes" from the list of available volcano observatories to receive notices about volcanoes in Hawaii and American Samoa.

For more information about the different types of VNS notifications, please see:

<https://volcanoes.usgs.gov/vhp/notifications.html>

If you have questions, please contact: askHVO@usgs.gov