Project title: *What can MERMAID's hydroacoustic data tell us about volcanic processes?*
Project Supervisors: Dr. Jessica Irving & Dr. Pete Rowley
Key topics: marine volcanism, seismic processing and interpretation

Project description:

Following the 2022 eruption of Hunga Tonga Hunga Ha'Apai (HTHH) a series of interesting, unusual signals were detected in MERMAID (Mobile Earthquake Recorder in Marine Areas by Independent Divers) hydrophone data. Broader exploration of MERMAID data has led to the identification of other possibly volcanic signals but at present there is a very limited understanding of what physical processes might be generating these signals, or where they originate.

At the intersection of volcanology and seismology, this project will involve processing and interpreting MERMAID data to begin to understand what it can tell us about ocean volcanism, and how we might use these, and other seismo-acoustic sensors for better hazard assessment. You will work on large hydroacoustic datasets, exploring continuous time-series data and/or targeted event-specific waveforms corresponding to distant volcanic events. MERMAID data are collected by the EarthScope-Oceans consortium (earthscopeoceans.org); this project will enjoy access to data from the Pacific Ocean.

Skills and knowledge gained: Students will gain experience in acoustic and seismic signal processing and interpretation, as well as develop an understanding of how volcanological processes link to the generation of different signal types.

Skills starting point: This would particularly suit those with a Physics, Maths, or a quantitative Earth Sciences background with experience of Python or Matlab. Understanding of signal processing, seismic or acoustic propagation, and/or seismic interpretation would be beneficial.

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