Board 0426: Characterizing Tsunami Signals from the Hunga Tonga Hunga Ha'apai Eruption and its Effects on the Caribbean

Tuesday, 13 December 2022

09:00 - 12:30

Poster Hall, Hall A (South, Level 3, McCormick Place)

Abstract

The Hunga Tonga Hunga Ha'apai eruption of January 15 2022, was a rare geological event, resulting in atmospheric pressure waves being recorded around the world. The event caused significant environmental consequences, including sea-level fluctuations in the Caribbean. The focus of this research is to analyze the tsunami and pressure waves generated in the Caribbean, by this volcanic eruption. These perturbations are uncommon and have not been seen in many occurrences, let alone with global implications. Modern instrumentation in the Caribbean including both barometers and sea-level stations provided a unique opportunity to observe and analyze this event. A comprehensive review of the observations recorded in the Caribbean and adjacent regions linking the barometric observations to sea level perturbations, including observations of the lead/lag of the sea level perturbations relative to the barometric pressure spikes and the frequency content of observable sea level perturbations is presented in this study. For instance, at several stations in Puerto Rico, 7 barometric spikes were observed of which the first 3 generated a significant sea level observation. Notably in Puerto Rico the second barometric spike lagged the sea level anomaly by ~80 minutes. Factors complicating observations or non-observations such as land-water interactions as well as interference from factors such as a strong cold front will also be discussed. The goal of this study, which will integrate observations from across the Caribbean, is to better understand the nature of this unique event and how it was observed in the region. As such, this research can offer insight into the factors that may influence volcanic tsunamis, which is invaluable for developing tsunami warning and response protocols.

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