Digitization of an Earthquake Swarm: Fernandina Caldera Collapse

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Caldera collapses are infrequently observed, and therefore there are many remaining questions concerning their structures and dynamics. In June 1968, the largest caldera collapse on a basaltic shield volcano occurred at Fernandina Volcano, which is located in the Galapagos Islands. The caldera collapse resulted in a swarm of earthquakes that lasted several weeks. These earthquakes were large enough to be recorded by analog WWWSSN stations around the globe. Though these earthquakes have the potential to illuminate processes involved in caldera collapse, they have not been studied using modern seismological techniques.

Geologic observations suggested that caldera collapse occurred along a curved ring fault. The goal of this project is to test this theory by digitizing the records for the earthquake swarm associated with the Fernandina caldera collapse. My work this summer consisted of starting the digitizing process. In the future, once the records are digitized, we will characterize the earthquake swarm by calculating centroid-moment-tensor (CMT) solutions. If slip actually occurred on non-planar faults, we expect to observe moment tensors with large non-double-couple components.