

Alcedo Volcano Field Mission- 2023

Lydia Whittaker, PhD Researcher

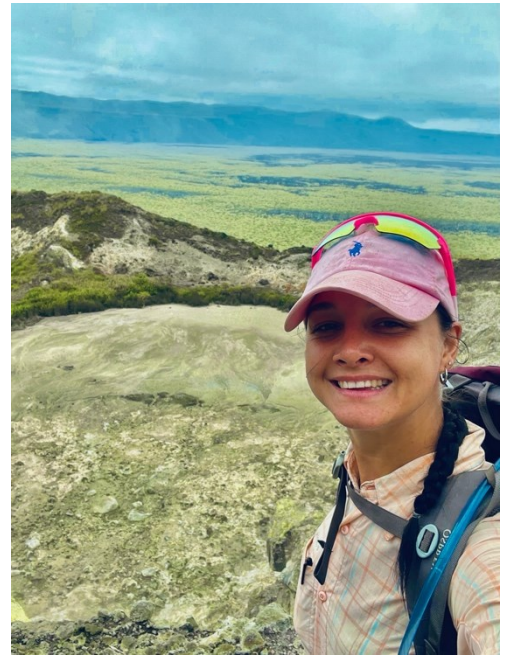
*Discipline of Geology, School of Natural Sciences, Trinity College
Dublin, Ireland*

Thanks to the Mineralogical Society postgraduate student bursary, The Geological Society Research Grants and The Julian Boldy Bursary, Trinity College Dublin I was able to participate in a field mission to Alcedo Volcano, the Galapagos Islands accompanied by a team of international researchers. The trip was led by Mike Stock of Trinity College Dublin, Ireland, accompanied by Dennis Geist, professor emeritus at the University of Idaho (USA) and a specialist in the geology of the Galapagos Islands, Marian Holness, a professor at Cambridge University (UK) and a specialist in the processes taking place in magmatic reservoirs, Benjamin Bernard, a member of the Escuela Politécnica Nacional (Ecuador) and a specialist in eruptive dynamics, and Jorge Zambrano, a student at the Escuela Politécnica Nacional, researching the rhyolitic eruptions of Alcedo.

The purpose of the expedition was to collect samples and gain insights into the enigmatic rhyolitic eruptions that occurred on this volcano nearly 100,000 years ago. The presence of such high silica content in the Galapagos is exceedingly rare, as typical eruptions in this region produce basalt. Therefore, Alcedo represents a unique natural laboratory where petrological/geochemical techniques can be deployed to directly compare the magmatic processes preceding rhyolitic and basaltic eruptions in a single magmatic system. In the current circumstances, an explosive rhyolitic eruption poses a significant threat to local fauna, tourism, agriculture, fishing, and the resident giant tortoise population. However, the likelihood of such an eruption is very low. Alcedo is an active volcano, but its last eruption, which took place in 1993, involved Hawaiian-type eruptions characterized by basaltic lava flows.

The trip took place between August 28 and September 4, 2023 and comprised of one week isolated camping on the volcano at the coastline and along the caldera rim. Fieldwork in the Galapagos is a challenge due to extreme temperatures, terrane and topography however, sample collection was a huge success collecting >60 samples of ash and lava, currently being analysed at Trinity College Dublin. Alongside the scientific research, the trip was an incredible experience as a postgraduate student. Spending a week immersed in the environment which is the focus of my research alongside internationally renowned experts in the field was an invaluable learning experience. I am incredibly grateful to have had the opportunity to learn from such inspirational scientists in what can only be described as one of the most stunning environments in the world.

This research is part of the project "What triggers Galapagos volcano eruptions? New objectives on Alcedo volcano" funded by Trinity College Dublin (PIEX-IG-23-01) and was conducted under a research permit from the Galapagos National Park (PC-67-23). Logistics were organized by the Charles Darwin Foundation. Immense thanks are extended to all those who enabled the success of this mission.



Myself (Lydia) at the summit of Alcedo overlooking the caldera.



Galapagos tortoises in their natural habitat, overlooking the caldera rim.



(Left to right) Dennis, Mike, Marian, Ben, Jorge, and Myself (Lydia) at the coastline ready for a day of fieldwork.