



The southernmost Central Volcanic Zone of the Andes: a natural laboratory for reconstructing the impact of large explosive Holocene eruptions (NEVA2)

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NEVA2 explores the impacts of large explosive volcanic eruptions during the Holocene, with a focus on the southern end of the Central Volcanic Zone (CVZ) of the Andes. These rare but catastrophic events release enormous volumes of pyroclastic material and gases, reshaping landscapes for centuries and influencing the global climate. Despite their significance, the cumulative and cascading effects of these processes on the Earth's critical zone—the interface of rock, soil, water, air, and life—as well as their role in past climate variability remain insufficiently constrained.

The project targets a unique natural laboratory in Chile and Argentina, where preliminary evidence suggests previously undocumented Holocene eruptions, including a major event at Nevado Tres Cruces volcano around 1,300 years BP (around the 8th century). This eruption appears to coincide with palaeoclimatic anomalies and cultural changes in pre-Hispanic societies, offering an exceptional opportunity to link geological, environmental, and archaeological records.

NEVA2 aims to identify and date large Holocene eruptions in the southern CVZ, model their dynamics and dispersal using advanced simulation tools, and assess multiscale impacts on the critical zone. It also seeks to correlate eruption timelines with palaeoclimate archives to evaluate associated climatic effects and disseminate findings to scientific communities, stakeholders, and the public.

Combining field surveys, laboratory analyses and modelling approaches, NEVA2 will deliver novel insights into volcanic hazards, provide new Holocene tephrochronological markers for the Southern Hemisphere, and contribute to improved risk mitigation strategies. The project also promotes education and stakeholder engagement to enhance resilience in volcanic regions.

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