

## **A tephra assessment of Lago Puyehue, Chilean Lake District, detailing the frequency of past volcanic activity**

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Lago Puyehue (4042'S, 7227'W) sits in the Southern Volcanic Zone (SVZ) of the Andes, Chile, at an elevation of 185 m a.s.l. It is a post-glacial, moraine-dammed lake, in which sediments began to accumulate at least ~ 18 kyr ago. A multi-proxy approach has been used to reconstruct the environment at this site (e.g., pollen, volcanic ash (tephra), mineralogy, grain size, magnetic susceptibility, loss-on-ignition, geochemistry, and radiocarbon dating). The 11.2 m long lacustrine record contains numerous tephra horizons, which provide a record of explosive activity in the region. Previous analysis of tephra has provided an excellent understanding the most recent (2011-2012) eruption, and a detailed analysis of visible tephra in the Puyehue Lake core will provide further constraints on the frequency of these moderate-sized eruptions, and possibly future ones too. So far, 106 visible tephra layers have been observed and glass major element geochemistry has been acquired for these units using Electron Microprobe Analysis, furthering previous work on this lake sequence. This geochemical data allows us to correlate tephra horizons to known eruptions and/or source volcanoes. It appears that most tephra layers recorded in the lake sediments are sourced from the nearby Puyehue-Cordón Caulle Volcanic Complex but there are numerous layers from other volcanoes in the SVZ. These results contribute to an improved tephrostratigraphic framework for the region, and furthered understanding of the frequency of past volcanic eruptions in the SVZ.