

Fire and Ice: deglaciation as a trigger for volcanism

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What is the role of glaciation in volcanism? Fully understanding this relationship has important implications for our knowledge of both past climate variability and future volcanic hazards. On short timescales, recent syntheses of historic eruptions and glacio-volcanic hazards have concluded that modern glacier recession likely will result in global intensification of eruptions. On longer, glacial timescales, previous research suggests that that enhanced volcanism, driven by deglaciation, accounts for at least part of the rise in atmospheric CO₂ during glacial terminations. This hypothesis goes on to invoke glacially induced volcanism as a positive feedback to climate warming and, thus, a fundamental component of the ice-age cycle. Our study will test this hypothesis by examining adjacent records of glaciation and volcanism at sites in the tropical Andes. Specifically, we will use surface-exposure dating to reconstruct (i) the timing of post-LGM glacier recession on volcanoes in Peru, Chile, and Bolivia, and (ii) the age of overlying lava flows. We will use these complementary chronologies to assess the relative timing of post-glacial eruptions.