Geophysical Research Abstracts
Vol. 17, EGU2015-12930-1, 2015
EGU General Assembly 2015

Timing of maximum glacial extent and deglaciation from HualcaHualca volcano (southern Peru), obtained with cosmogenic 36Cl.

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Andean glacial deposits are key records of climate fluctuations in the southern hemisphere. During the last decades, in situ cosmogenic nuclides have provided fresh and significant dates to determine past glacier behavior in this region. But still there are many important discrepancies such as the impact of Last Glacial Maximum or the influence of Late Glacial climatic events on glacial mass balances. Furthermore, glacial chronologies from many sites are still missing, such as HualcaHualca (15º 43′ S; 71º 52′ W; 6,025 masl), a high volcano of the Peruvian Andes located 70 km northwest of Arequipa.

The goal of this study is to establish the age of the Maximum Glacier Extent (MGE) and deglaciation at HualcaHualca volcano. To achieve this objetive, we focused in four valleys (Huayuray, Pujro Huayjo, Mollebaya and Mucurca) characterized by a well-preserved sequence of moraines and roches moutonnées. The method is based on geomorphological analysis supported by cosmogenic 36Cl surface exposure dating. 36Cl ages have been estimated with the CHLOE calculator and were compared with other central Andean glacial chronologies as well as paleoclimatological proxies.

In Huayuray valley, exposure ages indicates that MGE occurred $\sim$ 18 - 16 ka. Later, the ice mass gradually retreated but this process was interrupted by at least two readvances; the last one has been dated at $\sim$ 12 ka. In the other hand, 36Cl result reflects a MGE age of $\sim$ 13 ka in Mollebaya valley. Also, two samples obtained in Pujro-Huayjo and Mucurca valleys associated with MGE have an exposure age of 10-9 ka, but likely are moraine boulders affected by exhumation or erosion processes. Deglaciation in HualcaHualca volcano began abruptly $\sim$ 11.5 ka ago according to a 36Cl age from a polished and striated bedrock in Pujro Huayjo valley, presumably as a result of reduced precipitation as well as a global increase of temperatures.

The glacier evolution at HualcaHualca volcano presents a high correlation with precipitation cycles of the Altiplano (Tauca / Coipasa phases) and Heinrich 1 / Younger Dryas cold climatic events.

Research funded by Cryocrisis project (CGL2012-35858), Government of Spain