



Influence of Enso in Perú's Cordillera Blanca Glaciers

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In areas located over 2000 m.a.s.l., the warm phase of ENSO (El Niño) is characterized by a decrease in precipitation and an increase in temperature which can reach values above the annual average, while in the cold phase of ENSO (La Niña), precipitation increases and temperature decreases compared to the annual average. In both cases ENSO has an influence on the glacier evolution of the Andes.

The objective of the present investigation is to determine the influence of ENSO in the Cordillera Blanca through satellite images (glacier coverage delimitation) and climatic proxy (ice core) in the Shallap and Artesonraju glaciers respectively for the hydrological years between 2009/2010 to 2018/2019.

The climate analysis in both glaciers showed higher annual temperatures and lower precipitation, revealing the influence of the 2015/2016 El Niño on the studied glaciers. There was a prominent reduction in glacier coverage in Shallap, which is supported by the ice core record extracted from Artesonraju, presenting an equivalent accumulated water decrease and an ¹⁸O enrichment for this period. These findings point out the influence of the 2015/2016 El Niño that significantly reduced the glacier coverage in both studied areas. On the other hand, the 2011/2012 La Niña event displayed the opposite effect, that is, colder temperatures, less glacier coverage reduction, an increase in the volume of accumulated water and an impoverishment of ¹⁸O.

Given the results, it can be affirmed that during an El Niño year the loss of glacier coverage is greater, causing less equivalent water accumulation and an enrichment of ¹⁸O; inversely for a La Niña year. These results support previous findings shown in research about glaciers in Peru.