

QORI KALIS GLACIER - PERU

14.00°S 70.46°W

The Qori Kalis Glacier is the largest ice outlet from the Quelccaya Ice Cap which tops the Cordillera Vilcanota of the Cordillera Oriental in Peru's southeast corner. The ice cap itself has shrunk by at least 20 percent since 1963. But the Qori Kalis is disappearing at an accelerating rate: between 1998 and 2001 the terminus retreated an average of 155 metres per year--three times faster than average annual retreat from 1995 to 1998 but an alarming 32 times faster than the average annual retreat from 1963 to 1978.

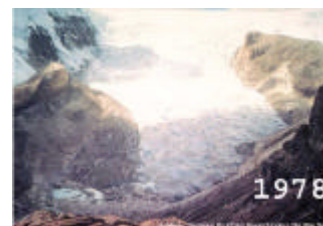
Qori Kalis has been studied closely since the 1970s because of the collaboration between Peruvian institutions and Ohio State University's Byrd Polar Research Center in the USA. The glacier study team is led by Lonnie Thompson and Ellen Mosley-Thompson. Their ice cores from the Quelccaya Ice Cap establish extremely valuable chronologies for paleoclimate studies that contribute to many areas of research.

The Qori Kalis drains the ice cap to the west and into the Vilcanota and the Paucartambo Rivers that drain along the Cordillera trend to the northwest. The Vilcanota becomes the Urubamba River as it passes through the ancient Inka Sacred Valley below Cuzco and Macchu Pichu before joining the Paucartambo. After another 1000 kilometres meandering towards the northwest, the flow turns east and becomes the Amazon River.

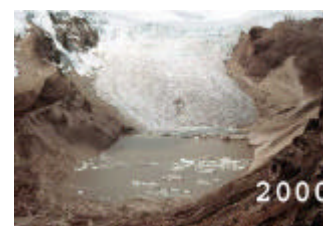
The precipitation in the Cordillera Oriental, and in most of Peru, originates in the steaming basins of the Amazon and the Parana River. The Cordillera Vilcanota ranges from 6384 metres above sea level at the Nevado Auzangate to 3600 metres at the valley floor and receives between 600 and 1000 millimetres of precipitation per year, decreasing to the south west. During the dry season that lasts from May to November the entire 2000 kilometres extent of the Vilcanota valley is dependent on slow delivery of glacier melt, as well as reservoirs of groundwater, to support one of the richest concentrations of biodiversity in the world.

This is the part of the Andes where the potato originates and today there are more than 250 wild varieties thriving in the valley. Peru's national bird, Cock of the Rocks (*Rupicola Peruviana*), lives here as well as the spectacled bear, the only bear species in South America. The area is also inhabited by the rare dwarf deer called Sachacabra and the Huemul deer, plus more than 300 bird species. The area boasts a large variety of flora species, with some 200 species of orchids registered as of the year 2000. It has one of the highest rates of endemism globally-- that is, the number of species that are unique to that region is one of the highest in the world.

Local inhabitants know their glaciers are disappearing. According to anthropologist Ingrid Bolin, within the last two decades the Apus (mountain deities) of the natives have changed beyond their understanding. One elder told her, "Our Apus have always had sparkling white ponchos. Now some of their ponchos have brown stripes; others have shed their ponchos altogether". Most recently, surface and groundwater supply has diminished and high mountain lakes are drying up.



L. Thomson / Byrd, Polar Research Center



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During the season of high glacier melt rate, the region suffers landslides and outburst floods, or aluviones.

The aluviones stimulate the interest of the hydropower companies because they can destroy installations. About half of Peru's electricity and one quarter of its total energy comes from hydropower. And while the eastern parts of Peru receive precipitation directly from the humid continental interior, the strip of Peru's Pacific coast is hyper-arid. The cities and settlements where most of Peru's population lives are totally dependent, year-round, on glacial melt to supply them with domestic and industrial supplies of water.

The high Cordillera and Nevado of the Andes mountains is undergoing a radical shift in climate. The last few decades have seen increased glacier melt and the response has been to build more hydroelectric capacity. When the discharge becomes unreliable or diminishes in total the response is to build coal, oil, and gas fuelled generating capacity. As Lonnie Thompson says, "The loss of these frozen reservoirs threaten water resources for hydroelectric power production in the region, and for crop irrigation and municipal water supplies..." What they're really doing now is cashing in on a bank account that was built over thousands of years but isn't being replenished. Once it's gone, it will be difficult to reform," In such cases, the countries will probably have to switch to burning fossil fuels to meet their power needs. And by doing so, they'll add more carbon dioxide and water vapor to the atmosphere _ two gases that are known to enhance the greenhouse effect and intensify global warming." Dr Thompson says..."We need to take the first steps to reduce carbon dioxide emissions. We are currently doing nothing."

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