

## Glacier Recession, Hydrologic Change and Livelihoods Vulnerability in the Andes



Throughout the tropics, glaciers are receding at an increasingly rapid pace. As harbingers of a warming planet, their disappearance will pose significant challenges for countries and human populations dependent on these frozen reservoirs. In Peru's Cordillera Blanca (the highest and most extensively glaciated range in the tropics) glacial melt water makes up a critical percentage of the water resources for millions of downstream users. Since 1970 more than 20 percent of the glaciers in the region have disappeared. Since 2007, an interdisciplinary group of researchers have been examining the changes. In an effort to address these pressing concerns, an interdisciplinary research team of social scientists, glaciologists and hydrologists from The University of California-Santa Cruz, Ohio State University, and McGill University are currently examining these questions. Research topics include: **(1)** quantifying recent and future changes in glacial volume; **(2)** evaluating the regional impact of glacial melt on seasonal and inter-annual water availability and quality; **(3)** assessing human vulnerability to increasing hydrological variability due to glacier-recession; **(4)** evaluating how changing access to water resources is contributing to livelihood adaptation and potential conflicts over resources; and **(5)** disseminating critical findings and recommendations for adaptive strategies to help mitigate the impacts of climate change and glacial recession on water resources and livelihoods.

Major research conclusions:

1. Climate change is already significantly affecting the Tropical Andes and glaciers throughout the region are receding very rapidly.
2. These changes are already affecting regional water supplies and watersheds.
3. New scientific research is needed to evaluate how fast glacier recession is occurring, how much glacial ice (volume) is left and how hydrologic change is occurring.
4. Human populations in the region are extraordinarily dependent on the water from glaciers in the region and along the arid Coast and are already experiencing significant environmental change through shifting water resources and new extreme weather variability.
5. Climate change is significantly increasing household vulnerability in the region and affecting human resilience and adaptive capacity.



Dr. Jeffrey Bury  
Department of Environmental Studies  
University of California, Santa Cruz  
jbury@ucsc.edu



Dr. Bryan Mark  
Department of Geography  
Byrd Polar Center  
Ohio State University  
mark.9@osu.edu



McGill

Dr. Jeffrey McKenzie  
Earth and Planetary Science  
McGill University  
Jeffrey.mckenzie@mcgill.ca