Submitted Abstract

ID IMC22-FSAbstr- 745

First Author First Name Last Name	 Emilio (1) Mateo
Submitting Author First Name Last Name	 Emilio Mateo
Correspondence	emateo@agci.org
Co-Authors >> E-Mails will be not listed	Mark, Bryan (1); Hellstrom, Robert (2); Baraer, Michel (3); Mckenzie, Jeffrey (4); Condom, Thomas (5)
Organisations >> for readability limited to 4 >> full list can be found online	1: Department of Geography, Byrd Polar and Climate Research Center, The Ohio State University, Columbus, OH, USA 2: Department of Geography, Bridgewater State University, Bridgewater, MA, USA 3: Département de génie de la construction, École de technologie supérieure, Montreal, QC, Canada 4: Department of Earth and Planetary Sciences, McGill University, Montreal, QC, Canada
Country	United States of America
Region	North America
Title	Streamflow Response To Glacial Changes And Warming Temperatures At High Elevations In The Cordillera Blanca, Peru From 2004-2020.
Keywords	Hydrology, Cryosphere, Edw, Andes, Glaciers
Type	List Of Focus Session
Focus Session ID	06

Abstract

Glaciers in the high mountains of the Andes greatly contribute to streamflow throughout the year, but in the face of climatic changes, their contributions are fluctuating and becoming less reliable. Our hydrometeorological network in the tropical Andean, Cordillera Blanca, Peru was designed with goals to evaluate how progressive glacier mass loss is impacting stream hydrology, and to better understand the local manifestation of climate change over diurnal to seasonal and inter-annual time scales. Over the past two decades, we have collected high temporal resolution discharge and weather observations in the upper portion of the Rio Santa Watershed, known as the Callejon de Huaylas, spanning across an elevation range of 3700 - 4750 m a.s.l. Analyses of the discharge data at a station in the Quilcayhuanca sub-catchment indicate a steady decrease in cumulative daily discharge during the dry season from 175 m3 to 50 m3, while the wet season discharge fluctuates more but also indicates a decreasing trend from 350 m3 to 150 m3. Daily discharge measurements in the Ranrahirca sub-catchment show an average decline of 1.1 m3/s from the beginning of observations here in 2008, to present. Temperature data gathered along an elevational gradient in the Ranrahirca sub-catchment, indicate increased warming of 0.7 °C/decade at 4500 m a.s.l., in comparison to much a much smaller increase of 0.1 °C/decade at 3900 m a.s.l. The lapse rates attained from this data also indicate a rise in freezing level height from 4800 to 5000 m a.s.l. Warming along this elevational gradient plays a key role in the glacial changes at higher elevations, directly altering the streamflow of rivers at lower elevations.