Tracing cryo-hydro-social transformations in the tropical Andes

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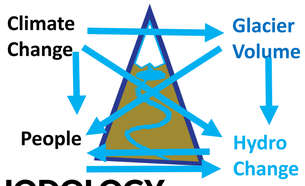
TARN
Transdisciplinary Andean Research Network
Red de Investigación Transdisciplinaria Andina

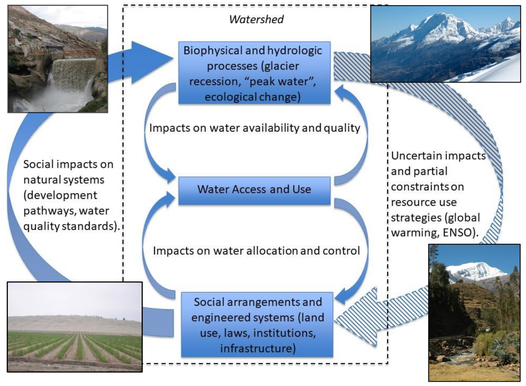
INTRODUCTION

Earth's tropical glaciers are losing mass, transforming downstream hydrology, impacting people.



METHODOLOGY

1. Embedded sustained observation
2. Multiple scales, transdisciplinary collaboration, local connections
3. Innovative imaging (LIDAR, UAV), high-resolution DEMs
4. Modeling: climate, glaciers, hydrology and chemistry



Drones, LIDAR and **thermal cameras** detect **glacial losses** that variably alters **streamflow** and impacts social-ecological **access** to water in the **Peruvian Andes.**

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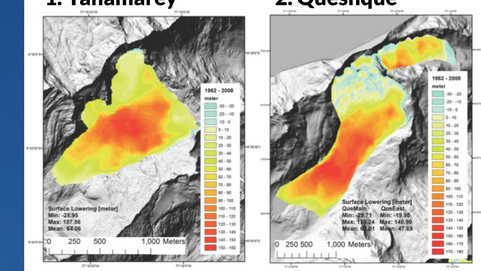
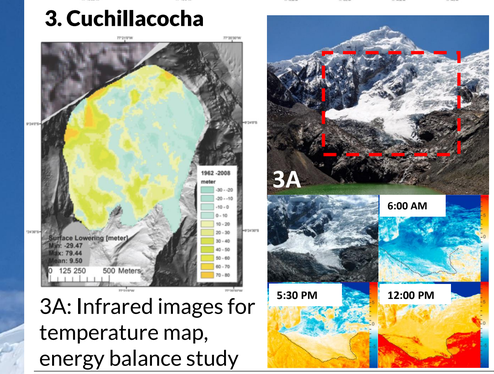
Elevation change LIDAR-photo (1962-2008)

1. Yanamarey **2. Queshque**

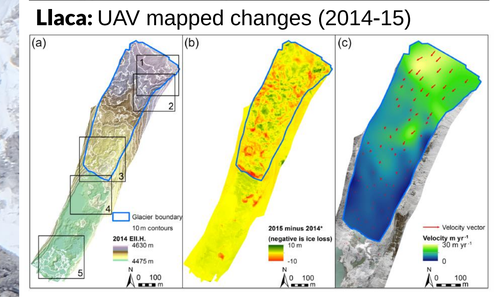


3. Cuchillacocha

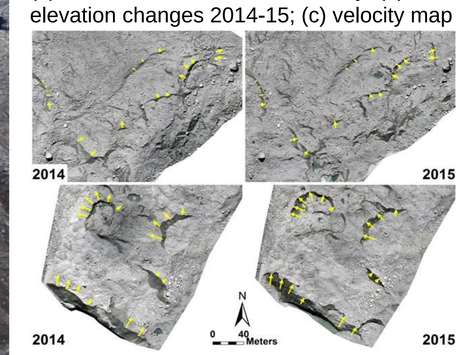


3A: Infrared images for temperature map, energy balance study

Llaca: UAV mapped changes (2014-15)



(a) 2014 elevation, ~5 cm accuracy; (b) elevation changes 2014-15; (c) velocity map



Enhanced glacier melt at ice cliffs/ponds

The Ohio State University

NSF NASA National Geographic Fulbright USAID BPCRC.OSU.EDU Department of Geography