INTRODUCCION

In South America are located over 99% of the areas of tropical glaciers and more than 71% in the Cordillera of Peru with an area of 1972 km² (Kaser y Osmaston 2002). The Cordillera Vilcanota contains about 25% of all glaciers in Peru and is the origin of the Rio Vilcanota-Urubamba, constituting an important national and regional water resource. 

• Between 1988 and 2010, the glacier area was reduced from some 360 km² to 270 km² with an annual retreat rate of about 4 km² (Hanshaw and Bookhagen, 2014)
• A total ice volume loss of 40-45% is estimated for the time period 1962-2006 (Salzmann et al. 2013)

Glacier mass balance values had so far not been available, but…

• in 2010, first measurements have been realized in the frame of PACC Perú, a cooperation initiative between Peru and Switzerland.
• since 2013, a 3-year monitoring program has been initiated by a team of researchers from the UNSAAC Cusco with the help of several Peruvian and Swiss institutions.

METHODOLOGY AND DATA

Methods
1) Direct glaciological method with stakes and snow pits for process understanding and resolution in time

Combined with:
2) DEM differencing of overall volume/mass changes and calibration of the measurements
   - Airborne LIDAR measurements from May 2013
   - Ground-based LIDAR measurements

planned in 2015

Measurements
• Observation of ablation - July 2010 to July 2011
  - October 2013 to October 2014 (13 stakes, every 2-3 months)
• Observation of accumulation - July 2010

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References

Acronyms
UNSAAC: Universidad Nacional de San Antonio Abad del Cusco
UGRH: Unidad de Glaciología y Recursos Hídricos Huaraz
WGMS: World Glacier Monitoring Service

New glaciological research projects in the Cordillera Vilcanota Cusco - Peru

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First observations 2013-2014

Suyuparina Glacier
• Steep, south-west oriented mountain glacier
• Maximum altitude: 5469 m asl
• Minimum altitude: 5150 m asl
• Elevation range: 319 m

Conclusions
• The “horizontal” ablation on ice cliffs seems to have a predominant effect on total ablation. There is a great need to understand more in depth these processes and their role in the glacier mass balance.
• Reliable estimates of the ELA and the annual mass balance must be made with repeated high-resolution DEMs.
• Long-term mass balance monitoring is planned as part of internationally coordinated glacier monitoring (WGMS) and for hydrological modeling in the region.

Contact and references