



## **Seminar**

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*and*

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**Friday, April 6, 2012**

**3:00pm**

**Dow 610**

## **Assessing the volume and hypsometric changes of the glaciers in the Tropical Peruvian Andes: Some case studies over Cordillera Blanca**

Tropical glaciers are very sensitive to changes in climate due to the low latitude radiation regime and steep vertical mass balance gradients. These mountain glaciers have rapidly retreated over the 20<sup>th</sup> century, raising concerns about downstream regional water supplies under continued global climate change. Monitoring tropical glaciers using remotely sensed data has drawn a great attention in earth science communities for decades and time-lapse analysis of sensory data has provided important variability information of tropical glacier recession. The motivation of this study is to refine a surface area to volume relationship for tropical glaciers to enable extrapolation of more detailed inventory of glacier volume and water resources. This study focuses on the glaciers in the Cordillera Blanca in Peru, within the world's largest concentration of tropical glaciers, to assess the volume and topographic changes over the late 20<sup>th</sup> century. A combination of LiDAR (Light Detection and Range) data achieved in 2008, DEMs (Digital Elevation Models) from vertical aerial photographs taken in 1962 by stereo-photogrammetry, and multispectral ASTER (Advanced Spaceborne Thermal Emission and Reflection Radiometer) imagery taken during 2001 – 2008 with geospatial techniques are used for this research. These airborne and Spaceborne imagery can reveal both current glacial surface topography and glacial profiles 46 years back, enabling calculation of the total volume loss trend over the last 46 years. The resulting improved understanding of how tropical glacier mass changes in response to climate dynamics is critical for global climate modeling, which can reliably predict future glacier changes only after accurately simulating the past.