

Tropical ice-cap found to be melting slower, the case of Nevado Coropuna Volcanic Complex, Southern Peru

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Overview

- Introduction to Coropuna
- Methods of remote sensing
- Results
- Hiram Bingham 1911 photos
- Implications
- Conclusions



- Peru is home to ~30 million people
- Arequipa Region – ~1.2 million people
- ~100,000 people around Coropuna



0 500 1,000 2,000 3,000 4,000 Kilometers

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, PCG, and the GIS User Community

Methods



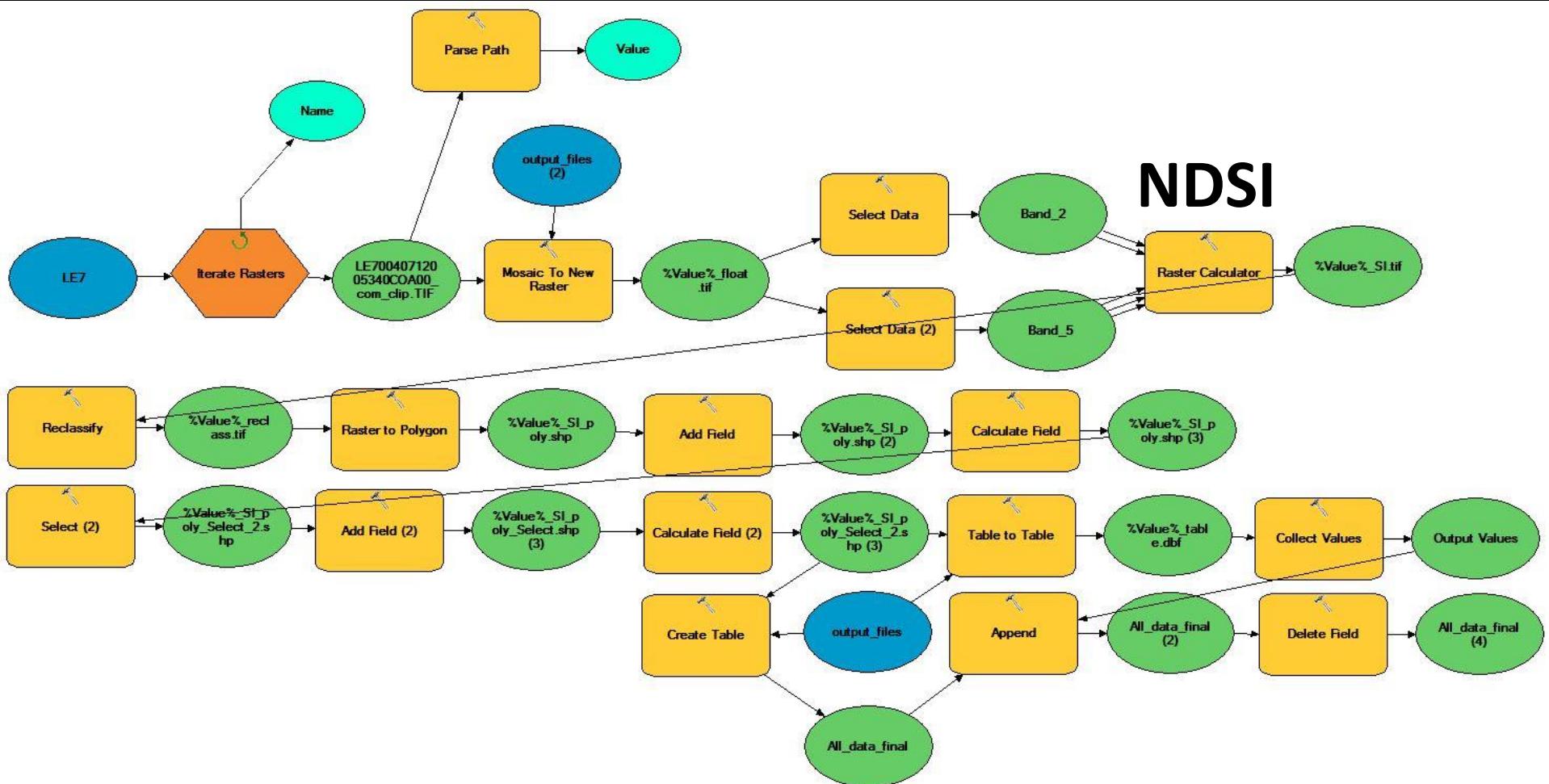
What makes a useable image?

- Scanning line error
 - LE7, 2003
- Day light
- Clouds
- Time of year

Landsat scene LE7004071201417CUB00



ArcGIS Model Builder allows for rapid processing of satellite images

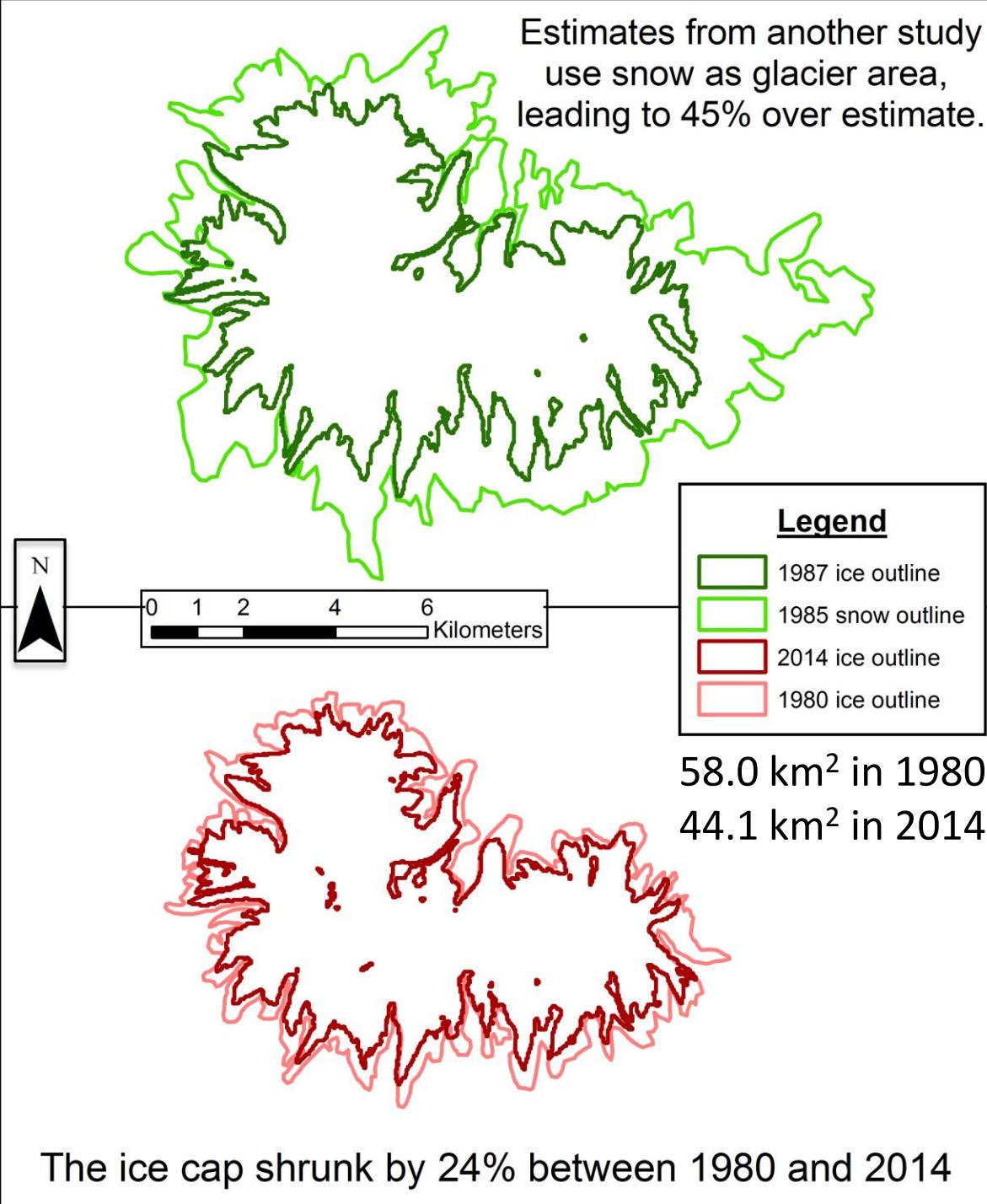


RESULTS

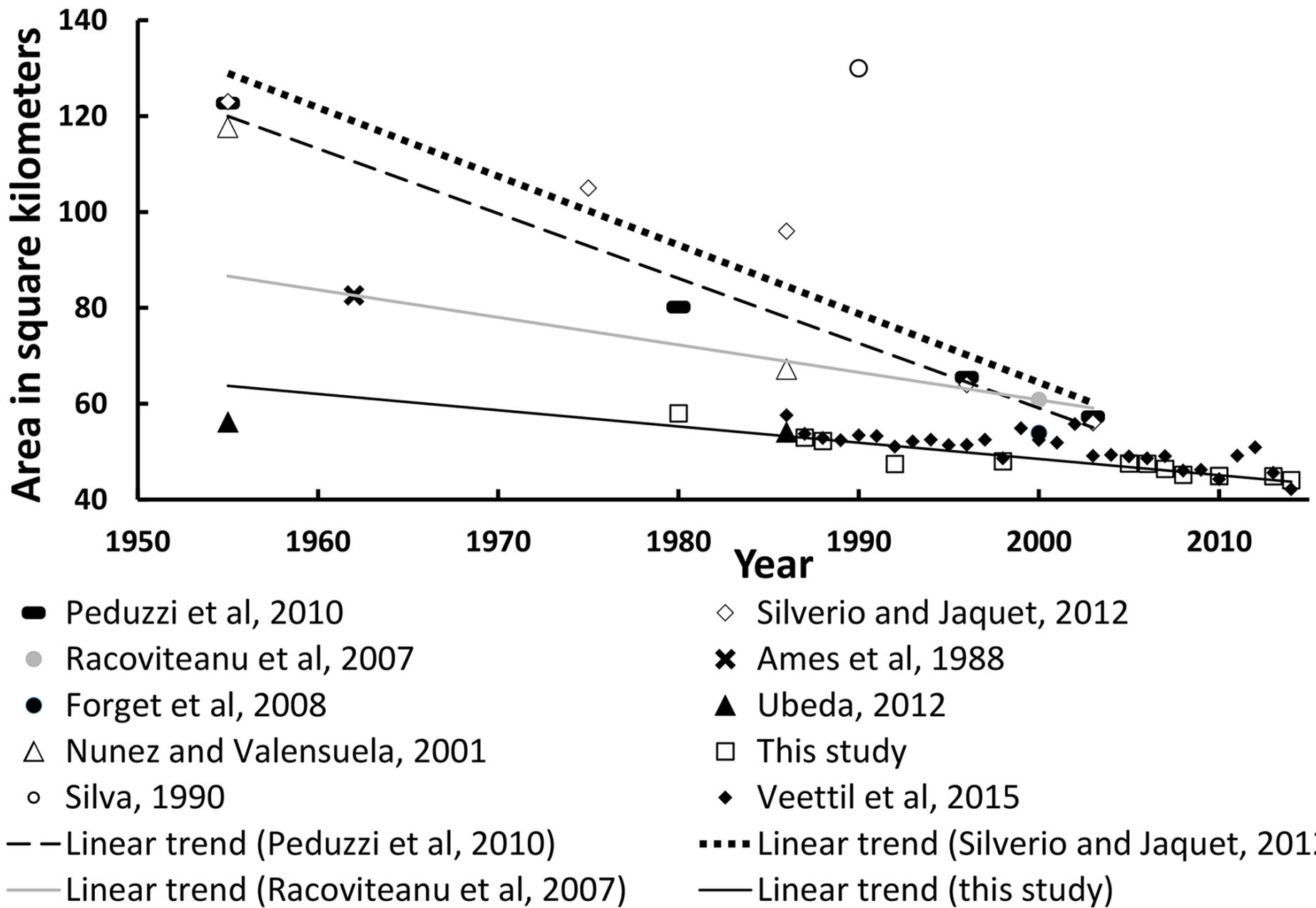
Main takeaways

1. ‘Mistaken ice’ (e.g. snow) makes for lots of ‘apparent’ variation
2. Longer term comparisons show that ice is retreating more slowly

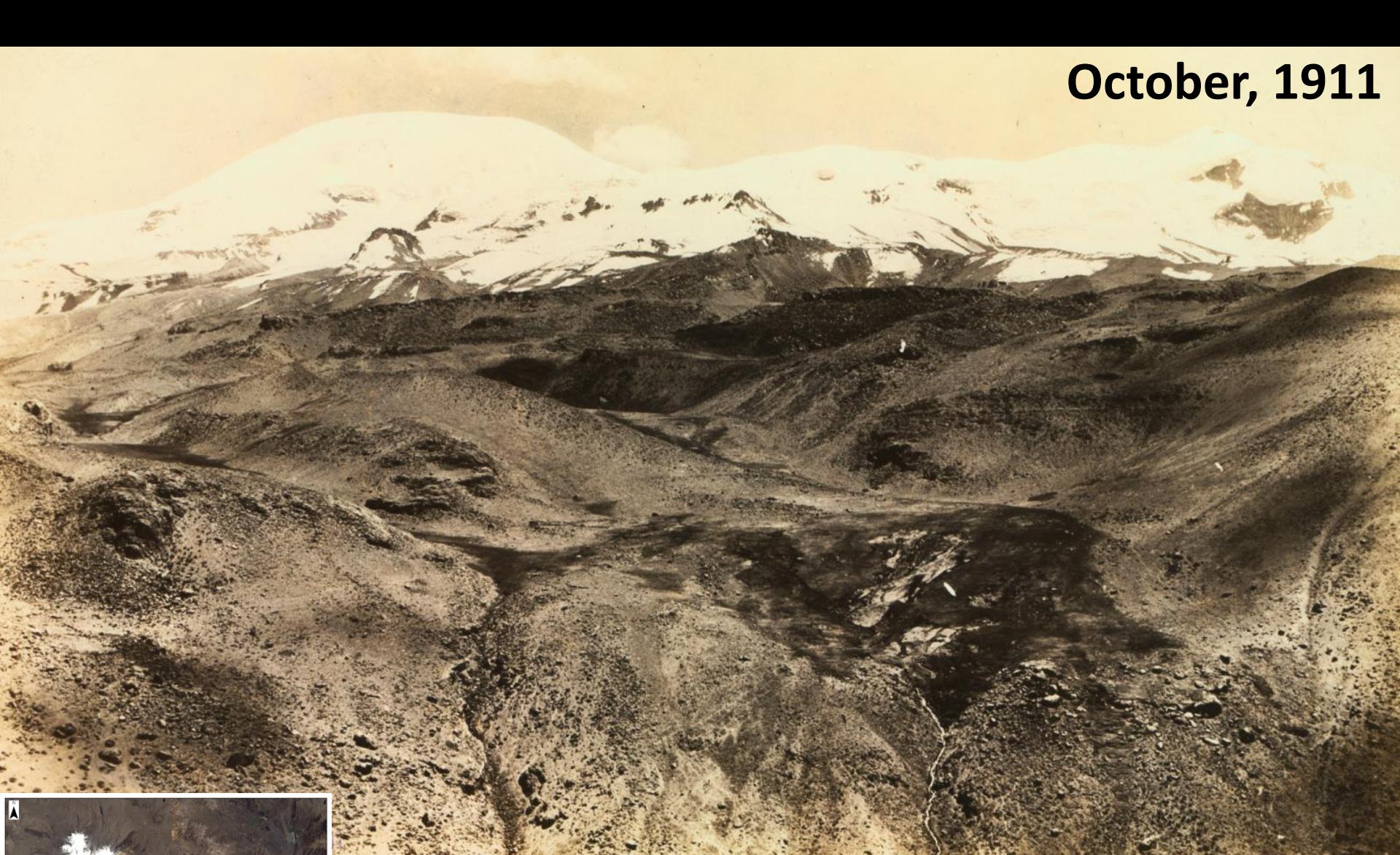
It is important to understand local climate!



Glacierized Area Nevado Coropuna, Peru

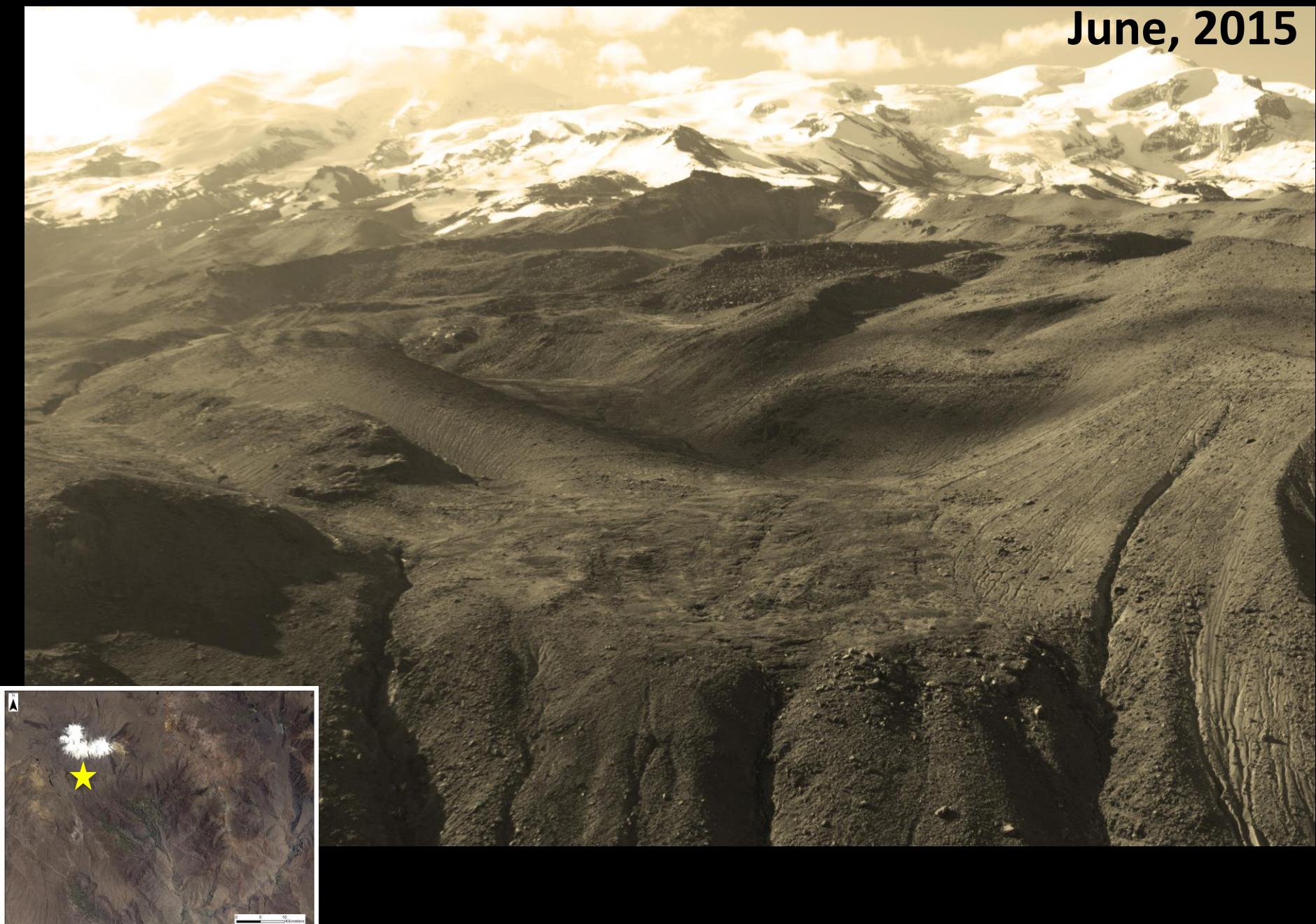


October, 1911

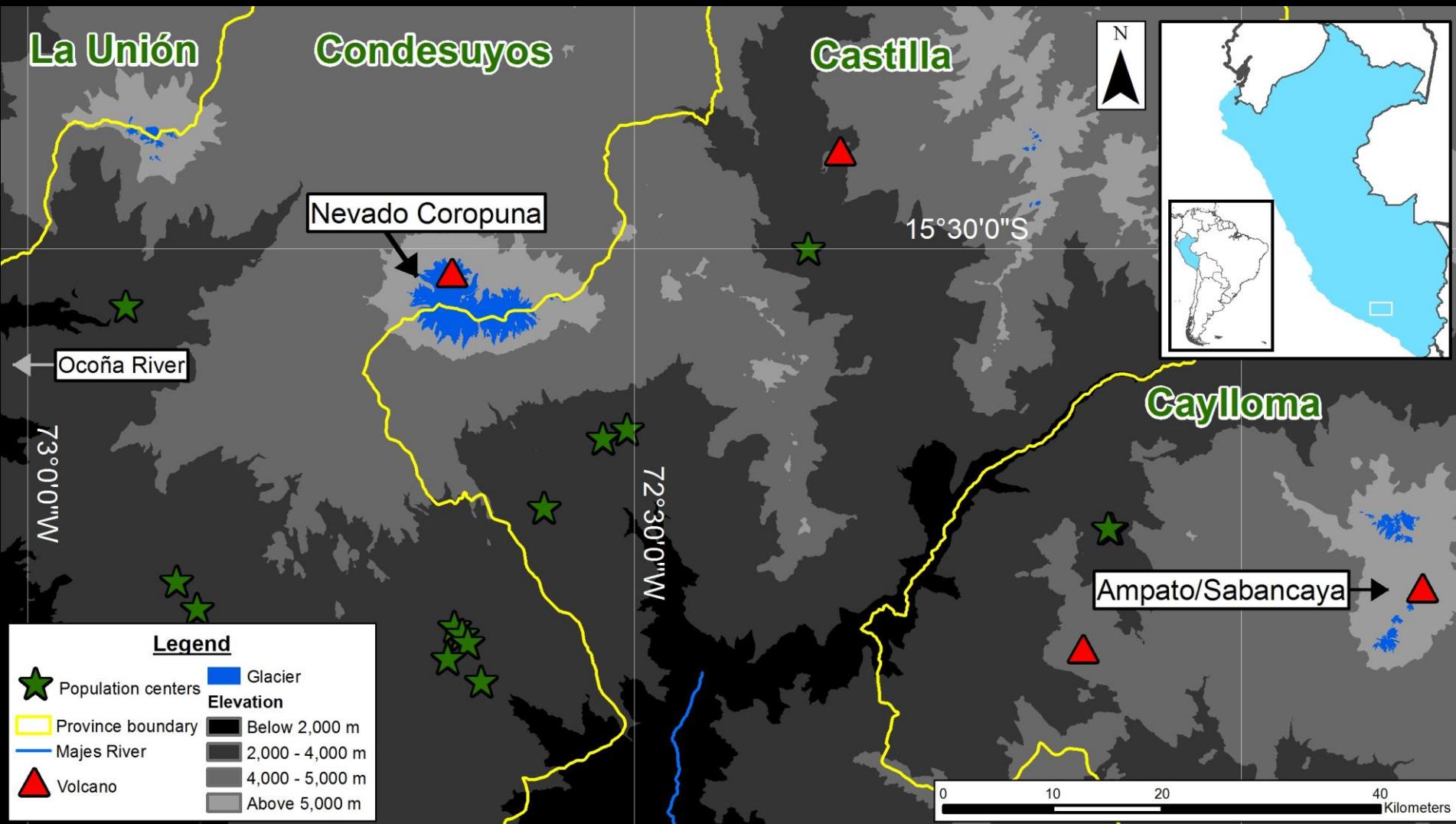


Courtesy of the Peabody Museum of Natural History, Yale University, New Haven, CT

June, 2015



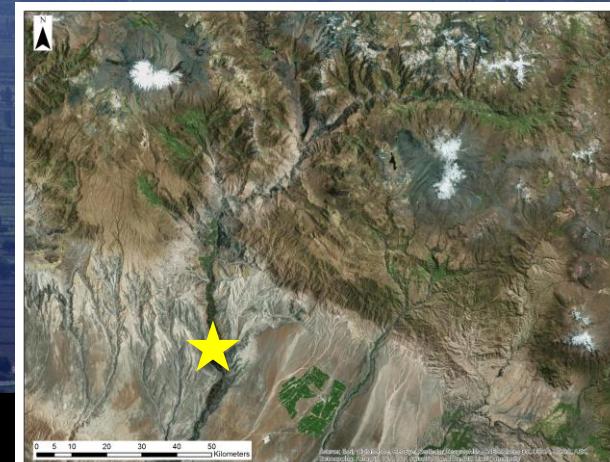
Implications



Volcano-Ice interactions, water supply

The importance of Nevado Coropuna

- Vital for Agriculture
- Peruvian adaptation plans
- Well-used representation for tropical ice in IPCC reports



Conclusions

1. Important to understand local climate for data selection (e.g. low snow if ice is goal)
2. Coropuna appears to be losing ice at one third the rate previously thought
3. Is this true for other tropical glaciers?



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Thank you! Questions?

