Earth surface processes: linking Earthscope to the hydrosphere, cryosphere, atmospheric sciences, geomorphology

What are the breakthrough results from Earthscope?

- Location of the Earth's hum.
- Detection of infrasound signals (from Space Shuttle and Bolide) and atmospheric structure.
- Routine precipitable water vapor, incorporated into NOAA forecasts
- Surface soil moisture, snow depth
- Hydrological loading and ground water pumping signals detected
- LIDAR - coverage of the faults (B4) and geoEarthscope

What are the key scientific questions and opportunities for Earthscope in next 5-10 years?

- Map water (groundwater, atmospheric water, soil moisture, snowpack, glaciers, vegetation water content) in time and space in the western U.S. and Alaska.
- Model loading/ hydrological processes for groundwater, lakes,rivers, glaciers, dams, etc.
- What is the coupling between atmospheric and earth system processes?
- How is the ice mass, permafrost (carbon sequestration), tundra, freeze-thaw cycle changing?
- High-resolution seismic imaging linked to climate or hydrology signals.
- Develop inSAR products for solid earth, hydrology, and cryosphere communities.
- Improved weather forecasting, particularly of extreme events.
- Do we need higher data-rates and real-time access (e.g. for GPS sites) to achieve more of our interdisciplinary science goals?

Synergies for Earthscope

- Breakthroughs and science goals are almost entirely based on using existing Earthscope facilities.
- Earthscope facilities and science goals complement upcoming Earth-science NASA missions.
- Earthscope facilities provide significant societal benefits and need to be maintained in the future.

How can the strength of different disciplines be most effectively combined to meet future science goals?

- We need to include the “water cycle” community in Earthscope workshops and activities so that appropriate products can be developed.
- Improved understanding of atmospheric/hydrological influences on Earthscope data will result in improved Earthscope products for the solid Earth.