EarthScope's Plate Boundary Observatory in Alaska: Building on Existing Infrastructure to Provide a Platform for Integrated Research and Hazard-monitoring Efforts

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EarthScope's geodetic component in Alaska, the UNAVCO-operated Plate Boundary Observatory (PBO) network, includes 139 continuous GPS sites and 41 supporting telemetry relays. These are spread across a vast area, from northern AK to the Aleutians. Forty-five of these stations were installed or have been upgraded in cooperation with various partner agencies and currently provide data collection and transmission for more than one group. Leveraging existing infrastructure normally has multiple benefits, such as easier permitting requirements and costs savings through reduced overall construction and maintenance expenses.

At some sites, PBO-AK power and communications systems have additional capacity beyond that which is needed for reliable acquisition of GPS data. Where permits allow, such stations could serve as platforms for additional instrumentation or real-time observing needs. With the expansion of the Transportable Array (TA) into Alaska, there is increased interest to leverage existing EarthScope resources for station co-location and telemetry integration. Because of the complexity and difficulty of long-term O&M at PBO sites, however, actual integration of GPS and seismic equipment must be considered on a case-by-case basis.

UNAVCO currently operates two integrated GPS/seismic stations in collaboration with the Alaska Earthquake Center, three with the Alaska Volcano Observatory, and three with the TA. By the end of 2015, PBO and TA plan to install another three integrated and/or co-located geodetic and seismic systems. While most of these are designed around existing PBO stations, the 2014 installation at Middleton Island was a completely new station for both groups, providing PBO with an opportunity to expand geodetic data collection in Alaska within the limited operations and maintenance phase of the project.

We will present some of the design considerations, outcomes, and lessons learned from past and ongoing projects to integrate seismometers and other instrumentation at PBO-Alaska stations. Developing the PBO network as a platform for ongoing research and hazard monitoring equipment will also continue to serve the needs of the research community and the public beyond the completion of EarthScope science plan in 2018