

PBO Real-time High-rate GPS Network Expansion

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The EarthScope Plate Boundary Observatory (PBO), through a NSF-ARRA supplement, has enhanced geophysical infrastructure in the Pacific Northwest by upgrading 232 Cascadia GPS stations to high-rate (1 Hz), low-latency (<1 s) data streams (Real Time-GPS (RT-GPS)). These upgraded sites are in addition to the original 100 RT-GPS sites, which were part of PBO. With the addition of the RT-GPS sites in the Pacific Northwest, the NSF has created a natural laboratory in an area of great scientific interest and high geophysical hazard in order to spur new volcano and earthquake research opportunities. Streaming RT-GPS data will enable researchers to investigate strong ground motion during large geophysical events, which has implications for earthquake hazard mitigation. At least 40 more stations will be added to the original 232 RT-GPS sites, because of newly realized cost savings, including 20 which will expand the Cascadia footprint and 20 other regional backbone stations. Approximately 20 meteorological instruments also will be added to the PBO network as part of this project. Three stations along the Cascadia margin will be augmented with a fail-over satellite communications system as well. In the event of a large Cascadia event and subsequent potential power and communications failures, these sites will automatically switch to satellite communications to keep live data streaming operational for the hazard community.

UNAVCO now operates nearly 350 high-rate PBO RT-GPS stations along the western coast of North America and Alaska. With these additional upgrades, the PBO RT-GPS network will increase to well over 400 stations. The RT-GPS stations within PBO are monitored and managed using Trimble's VRS3Net software. UNAVCO staff is working closely with the UNAVCO community to develop data standards, protocols, and a science plan for the use of RT-GPS data.

