

Upgrades and Improvements to the PBO Cascadia Network: Implementation Of A Large Scale Real-Time GPS Network, Telemetry Upgrades, Collocation of Cascadia Earthquake Early Warning System

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The EarthScope Plate Boundary Observatory (PBO), through a NSF-ARRA supplement, has enhanced the geophysical infrastructure in the Pacific Northwest by upgrading 232 Plate Boundary Observatory GPS stations to allow the collection and distribution of high-rate (1 Hz), low-latency (<1 s) data streams (RT-GPS). Upgraded stations supplemented the original 100 RT-GPS stations in the PBO GPS network making a total of 432 stations. Streaming RT-GPS data will enable researchers to detect and investigate strong ground motion during large geophysical events, including a possible plate-interface earthquake, which has implications for earthquake hazard mitigation. The installation of three BGAN satellite fail over systems along the Cascadia margin will allow for the continuation of data flow in the event of a loss of primary communications during a large geophysical event or other interruptions in commercial cellular networks. PBO Pacific Northwest is in close collaboration with University of Washington to collocate 10 Earthquake Early Warning Systems (EEW) at PBO GPS sites. The EEW system will consist of strong motion sensors and high speed RT telemetry. Summer 2015 upgrades will include a complete overhaul of aging radio technology at one major network and several small radio networks in the Pacific Northwest. Upgrades will increase reliability and enhance the speed of existing telemetry infrastructure. Plans to upgrade telemetry on the entire Pacific Northwest network will continue through summer 2018.



Figure 1. Current UNAVCO Real-Time stations, including the Cascadia stations and expansion subset (Blue and Red)