

PBO and Regional Existing Arrays
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The Plate Boundary Observatory (PBO), as a core component of EarthScope is designed to study the three-dimensional strain field resulting from deformation across the active boundary zone between the Pacific and North American plates in the western United States. Other components of EarthScope include USArray, a seismic look at continental structure, and the San Andreas Fault Observatory at Depth, SAFOD, a 4 km drill hole near Parkfield. EarthScope consists of three primary funding elements including, peer reviewed science proposals that utilize the EarthScope infrastructure and data products, a Major Research Equipment and Facilities Construction (MREFC) component with a five year lifespan that will build the core EarthScope Facilities, and an Operations and Maintenance component with a 10 year duration that will be funded through Research and Related Activities (R&RA) funds.

The PBO Facility will consist of four elements. First, a backbone network of 100 new and 20 existing GPS receivers that will provide a long-wavelength, long-period synoptic view of the entire plate boundary zone. The backbone will cover western North America and Alaska at a receiver spacing of 200 km. The second element consists of focused dense deployments of 875 permanent GPS and 175 strainmeters in areas where active tectonic phenomena occur with an instrument spacing of 5-10 km. The third element of PBO is a pool of 100 portable GPS receivers for temporary deployment and rapid response will be used for densifying areas not sufficiently covered by continuous GPS and responding to volcanic and tectonic crises. The fourth element will include the establishment of a national center for the storage and retrieval of digital imagery and geochronology facilities to support geologic and paleoseismic studies in the PBO.

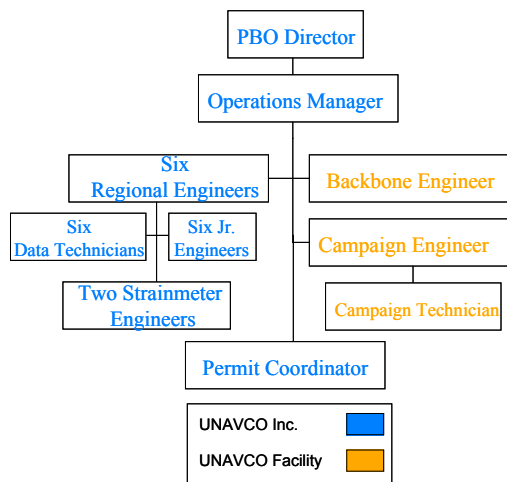


Figure 1. Operations management structure under the PBO Director. Job titles in blue indicate UNAVCO Inc. Employees. Job titles in orange represent UNAVCO Facility positions.

PBO will operate as a program under UNAVCO Inc. and managed by a director appointed by the UNAVCO Inc. President. PBO Director will have primary supervisory, budgetary, management, and reporting responsibility for all components of the PBO effort. The PBO Director will oversee two key personnel, the Operations Manager who will handle operational aspects of the PBO network and the Data Products Manager who will oversee data flow, data processing, data products, and data archiving activities (Figure 1). A PBO Standing Committee, of knowledgeable scientists, is charged with representing the scientific

community in the implementation and management of the overall PBO Facility including

data quality, data types, data products, and the accessibility of data and derivative products to the community. In addition, four Science Advisory Committees (including a

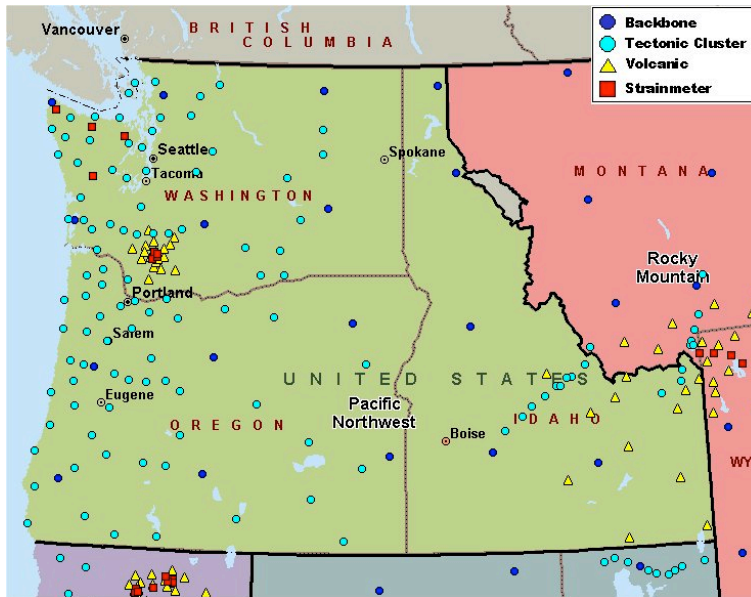


Figure 2. PBO Pacific Northwest region includes a total of 13 new and 4 existing backbone, 135 new tectonic cluster, and 8 strainmeters installations.

subduction, transform, intraplate, and magmatic systems committees) will be appointed by the UNAVCO Inc., President to provide science input on all topics related to building PBO including advice on siting and prioritization of station installations. It is assumed that regional network investigators will play a pivotal role on the Science Advisory Committees.

The PBO Facility and regional networks will interact on two primary levels. First, UNAVCO

Inc., with the help of regional network operators, is preparing a proposal to fund existing network operations, maintenance, and upgrade activities for the next five years. In the PANGA network, 35 stations are slated for continued support under this grant. Money will flow as subcontracts to regional networks to fund existing operations, maintenance, and data processing activities. At the end of the five-year grant, the supported regional network stations will be absorbed into PBO operations and maintenance activities.

Second, PBO will rely heavily on regional expertise for advice on siting, reconnaissance, and permitting of sites within each region. Although the responsibility of doing these tasks remains with PBO, the Facility must interact, utilize, and build upon the existing expertise developed in existing geodetic arrays. The Pacific Northwest region is slated for a total of 148 new GPS permanent station and 8 strainmeter installations (Figure 2). Ensuring that these stations are installed in the correct scientific priority and in a logistically sensible fashion will require the participation of regional scientist on the Science Advisory Panels and a strong working level relationship between PBO Regional Engineers and existing network staff.