



UNAVCO GPS High-Rate and Real-Time Products and Services: Building a next generation geodetic network.

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Recent advances in GPS technology and data processing are providing position estimates with centimeter-level precision at high-rate (1-5 Hz) and low latency (<1 s). Broad community interest in these data is growing rapidly because these data will have the potential to improve our understanding in diverse areas of geophysics including properties of seismic, volcanic, magmatic and tsunami deformation sources, and moreover profoundly transforming rapid event characterization, early warning, as well as hazard mitigation and response. Other scientific and operational applications for high-rate GPS also include glacier and ice sheet motions, tropospheric modeling, and better constraints on the dynamics of space weather.

UNAVCO, through community input and the recent Plate Boundary Observatory (PBO) NSF-ARRA Cascadia initiative, has nearly completed the process of upgrading a total of 373 PBO GPS sites to real-time high-rate capability and these streams are now being archived in the UNAVCO data center. Further, through the UNAVCO core proposal (GAGE), currently under review at NSF, UNAVCO has proposed upgrading a significant portion of the ~1100 GPS stations that PBO currently operates to real-time high-rate capability to address community science and operational needs. In addition, in collaboration with NOAA, 74 of these stations will provide meteorological data in real-time, primarily to support watershed and flood analyses for regional early-warning systems related to NOAA's work with California Department of Water Resources.

In preparation for this increased emphasis on high-rate GPS data, UNAVCO hosted an NSF funded workshop in Boulder, CO on March 26-28, 2012, which brought together 70 participants representing a spectrum of research fields with a goal to develop a community plan for the use of real-time GPS data products within the UNAVCO and EarthScope communities. These data products are expected to improve and expand the use of real-time, high-rate GPS data over the next decade.