



The Promise and Challenges of High Rate GNSS for Environmental Monitoring and Response

John LaBrecque

Global Geodetic Observing System, University of Texas at Austin, West Palm Beach, FL, United States (Jlabrecq@mac.com)

The decadal vision Global Geodetic Observing System recognizes the potential of high rate real time GNSS for environmental monitoring. The GGOS initiated a program to advance GNSS real time high rate measurements to augment seismic and other sensor systems for earthquake and tsunami early warning. High rate multi-GNSS networks can provide ionospheric tomography for the detection and tracking of land, ocean and atmospheric gravity waves that can provide coastal warning of tsunamis induced by earthquakes, volcanic eruptions, severe weather and other catastrophic events. NASA has collaborated on a microsatellite constellation of GPS receivers to measure ocean surface roughness to improve severe storm tracking and a equatorial system of GPS occultation receivers to measure ionospheric and atmospheric dynamics. Systems such as these will be significantly enhanced by the availability of a four fold increase in GNSS satellite systems with new and enhanced signal structures and by the densification of regional multi-GNSS networks. These new GNSS capabilities will rely upon improved and cost effective communications infrastructure for a network of coordinated real time analysis centers with input to national warning systems. Most important, the implementation of these new real time GNSS capabilities will rely upon the broad international support for the sharing of real time GNSS much as is done in weather and seismic observing systems and as supported by the Committee of Experts on UN Global Geodetic Information Management (UNGGIM).