The role of NASA's Global GPS Network in Regional and Global Geodesy and Modernization Plans for Integrating New GNSS Observables

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NASA supports the Global Navigation Satellite System (GNSS) infrastructure through a network of 75 permanent stations called the Global GPS Network (GGN). The GGN is operated cooperatively by JPL and UNAVCO. GGN data are contributed to the International GNSS Service (IGS) global network. GGN stations make up approximately 20 percent of the IGS and are some of its longest running core stations. GNN sites provide 1 to 30 second sampling and a number of stations have available real-time data streams. Data are used to produce highly accurate products that are essential for Earth science research and other multidisciplinary and educational applications. Products include GNSS precise satellite orbits, Earth rotation parameters, global tracking station coordinates and velocities, satellite and tracking station clock information, zenith tropospheric path delay estimates, and global ionospheric maps. These global data and products form the critical framework that regional GNSS networks depend upon. The GGN is currently being upgraded to accommodate additional GNSS observables as they become available including the new GPS L2C and L5 signals, Galileo, and GLONASS. Careful consideration is being made to integrate new equipment and observations without adversely affecting the time series measurements at critical stations. As part of this effort, a special new monument design is being tested at UNAVCO's Colorado test facility. The monument can accommodate multiple antennas that can be used for collocated observations while new site equipment is phased into operation.