

Next Generation NASA Initiative for Space Geodesy

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Space geodesy measurement requirements have become more and more stringent as our understanding of the physical processes and our modeling techniques have improved. In addition, current and future spacecraft will have ever-increasing measurement capability and will lead to increasingly sophisticated models of changes in the Earth system.

Ground-based space geodesy networks with enhanced measurement capability will be essential to meeting these oncoming requirements and properly interpreting the satellite data. These networks must be globally distributed and built for longevity, to provide the robust data necessary to generate improved models for proper interpretation of the observed geophysical signals. These requirements have been articulated by the Global Geodetic Observing System (GGOS).

The NASA Space Geodesy Project (SGP) is developing a prototype core site as the basis for a next generation Space Geodetic Network (SGN) that would be NASA's contribution to a global network designed to produce the higher quality data required to maintain the Terrestrial Reference Frame and provide information essential for fully realizing the measurement potential of the current and coming generation of Earth Observing spacecraft. Each of the sites in the SGN would include co-located, state-of-the-art systems from all four space geodetic observing techniques (GNSS, SLR, VLBI, and DORIS). The prototype core site is being developed at NASA's Geophysical and Astronomical Observatory at Goddard Space Flight Center. The project commenced in 2011 and is scheduled for completion in late 2013. In January 2012, two multi-constellation GNSS receivers, GODS and GODN, were established at the prototype site as part of the local geodetic network. Development and testing are also underway on the next generation SLR and VLBI systems along with a modern DORIS station. An automated survey system is being developed to measure inter-technique vector ties, and network design studies are being performed to define the appropriate number and distribution of these next generation space geodetic core sites that are required to achieve the driving ITRF requirements.

We present the status of this prototype next generation space geodetic core site, results from the analysis of data from the established geodetic stations, and results from the ongoing network design studies.