SGP: Current Status and Plans for 2016

The NASA Space Geodesy Project (SGP) encompasses the development, operation, and maintenance of a Global Network of Space Geodetic technique instruments. This network helps maintain a stable terrestrial reference system and contributes data and analysis to help fully realize the measurement potential of the coming generation of earth observing spacecraft. This network is comprised of sites around the globe that utilize the four major space geodetic observing components: Very Long Baseline Interferometry (VLBI), Satellite Laser Ranging (SLR), Global Navigation Satellite System (GNSS), and the Doppler Orbitography and Radio-positioning by Integrated Satellite (DORIS) system.

UNAVCO’s role in support of SGP is the permitting, installation, and operation of GNSS infrastructure at selected core sites in the SGP network.

In early 2015, UNAVCO began the first round of SGP GNSS installations at the Kokee Geophysics Observatory (KPGO), on the Hawaiian island of Kauai and the Haleakala Observatory on Maui. Both locations will be combined into a single SGP core site containing all four previously mentioned geodetic techniques. The VLBI antenna is being completed at KPGO with an updated DORIS site nearby. The SLR will be located at Haleakala. Multiple GNSS monuments installed at each site will be used to calibrate the instruments, measure site stability, and provide baselines to the two sites together.

A total of five GNSS stations are currently operating at the two observatories.

Harvest Oil Platform, CA: HARV

In addition to oil drilling, the Harvest Platform is also an important resource for the study of climate change from the ocean. This platform hosts the patterns, continuous, and recent variations in sea level relative to the platform. Data from two NASA-GNSS monu- ments at this site can help determine the exact level of the ocean relative to the platform.

The new monument (HARX), near the original HARV monument, is a legacy design using a new, temporary monument (HARX), near the original HARV monument. The new system was configured with legacy components; however there are no plans to complete additional upgrades in 2016.

St. Croix: CRO1

Antenna Monument Upgrade

UNAVCO and JPL, along with the rest of the SGP, have undertaken large efforts to improve the current GNSS monument at CRO1. The monument is located in the middle of a small field near the ocean, and the structure has significant exposure to the elements.

The new monument (CRO1) is constructed of a 10’ steel pole with a 3’ side radius, covered with a radome. The radome is also a legacy design, using a new, temporary monument (CRO1), near the original CRO1 monument. The new system was configured with legacy components; however there are no plans to complete additional upgrades in 2016.

Fairbanks, Alaska: FAIR

New Site Deployment

Many of the stations in the GGN provide data that are critical for helping to realize the International Terrestrial Reference Frame. The network is part of a global effort to establish and maintain the International Terrestrial Reference Frame. As part of its support to the International GPS Service, UNAVCO is currently in the process of deploying new infrastructures and upgrades at these stations with more advanced technology and infrastructure on ongoing baselines, at the direction of 1st Station Manager, FAIR, and the Gilmore Creek Observatory in Fairbanks Alaska, one of our key "International Reference" stations.

The existing monument at this site is too small for support of the new monument (FAIR), near the original FAIR monument. The monument was in need of repair and stabilization. The new structure will support a multi-GNSS-capable choke ring antenna system, FAIR to allow the long-running original monument to remain functioning and undisturbed. The new structure will support a multi-GNSS-capable choke ring antenna system, FAIR to allow the long-running original monument to remain functioning and undisturbed. The new structure will support a multi-GNSS-capable choke ring antenna system, FAIR to allow the long-running original monument to remain functioning and undisturbed.

Easter Island, Chile: ISPA

Communication Upgrade

All of the stations in the GGN utilize independent satellite communication links to transmit data to the stations. The base station in ISPA, located on the isle of Pascua in Easter Island, was the first to receive a satellite upgrade in 2010, and plans are moving forward to do so for all sites in the GGN. These upgrades will allow the monitoring of multi-GNSS data from two separate receivers located at the site.

UNAVCO plans to install a second monument in the immediate vicinity of ISPA in 2016. The new monument at this site is too small for support of the new monument (ISPA2), near the original ISPA monument. The monument was in need of repair and stabilization. The new structure will support a multi-GNSS-capable choke ring antenna system, ISPA to allow the long-running original monument to remain functioning and undisturbed. The new structure will support a multi-GNSS-capable choke ring antenna system, ISPA to allow the long-running original monument to remain functioning and undisturbed.