UNAVCO Data Center Efforts in Data Infrastructures and Integration Capabilities for Geodesy

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The UNAVCO Data Center in Boulder, Colorado, archives for preservation and distributes geodesy data and products in the GNSS, InSAR, and LiDAR domains to the scientific and education community. The GNSS data are useful for geodesy, tectonic, volcanologic, ice mass, glacial isostatic adjustment, meteorological and other studies. UNAVCO hosts GNSS data from 2,500 continuously operating stations and 8000 survey-mode observation points around the globe that are operated by over 100 U.S. and international members of the UNAVCO consortium. UNAVCO has an open access data policy and strives to provide catalogs and data access tools to facilitate maximum scientific and societal use of its data holdings.

UNAVCO's geodesy holdings represent only a fraction of the data available from thousands of geodetic observation sites, with data hosted at hundreds of globally distributed data centers. These data are valuable for scientific research, education, hazards assessment and monitoring, and emergency management. However, the disparate data holdings structures, access restrictions, metadata encodings, and infrastructures at these numerous data centers represent a significant obstacle to use by scientists, government entities, educators and the public.

In an effort to create a unified data and metadata access capability for geodesy data centers in general, UNAVCO, along with several partner U.S.-based geodesy data centers, have designed and implemented software for simplified access called the Geodesy Seamless Archive Centers (GSAC). GSAC is a web services based technology to facilitate the geodesy data discovery and access and is intended to be simple to install and run for most geodesy data centers. The GSAC technology leverages several well-accepted geodesy data and metadata formats, and identifies a relatively small set of required and recommended metadata for the basic installation. Additional optional metadata can be defined at individual data centers. The GSAC services utilize a repository layer implemented at each data center, and a service layer to identify and present both the required metadata elements along with any data center-specific services and capabilities.

The software for the GSAC is available through SourceForge, and any geodesy data archive can download the code and implement GSAC services for their repository; doing so will provide the data center's users with the ability to use common query and access mechanisms with other GSAC data centers. Further, optional federation of individual GSAC data centers is facilitated through the GSAC software. We believe this technology could be implemented at many geodesy data centers and would provide a significant step towards simplifying user data access. We are discussing using this technology with EPOS data centers as part of the COOPEUS initiative.