Enabling integration of metadata and data from facilities and research infrastructures such as UNAVCO presents many coordination challenges. UNAVCO’s geodetic archive collection is diverse including GPS observations from 1,000s of continuously operating stations around the world, 3D terrestrial laser scanning “point clouds”, and spatial satellite radar data (InSAR). Formats and protocols for discovery and access to these collections are heterogeneous and continually evolve, as do user requirements, complicating harmonizing of data services both within the facility and between facilities. One of UNAVCO’s earliest efforts at an integrated research infrastructure for geodesy was the Geodesy Seamless Archive Centers (GSAC). GSAC showed the utility of federated web services-based data search and access. Under the COOPEUS project, this demonstration was extended to include some countries participating in the European Plate Observing System. GSAC is also a core piece of “Dataworks for GNSS”, a UNAVCO effort to build more full-featured integrated data system components linking Caribbean data centers.

The EarthCube Building Block project “GeoWS” took the web services concept from an inter-domain infrastructure capability (geodesy only) to the next level as a cross-domain infrastructure capability (geodesy, seismology, marine geophysics) through definition of common, standards-based vocabularies and exchange formats. As part of a new initiative, ten’s of U.S. data facilities in the Council of Data Facilities are collaborating to harmonize repository metadata. With the newly funded EarthCube project “GeoSciCloud” IRIS and UNAVCO will test out GeoWS and other web services, and a significant sampling of core data center operations on the Amazon and NSF XSEDE clouds. Ultimately, standards should have international acceptance so UNAVCO is working on GeodesyML and Timeseries ML - both under the Open Geospatial Consortium (OGC) umbrella. UNAVCO is also working with GEO Supersites and the Committee on Earth Observations (CEOS) to promote an InSAR product archive format.