



New Developments in Geodetic Data Management Systems for Fostering International Collaborations in the Geosciences

Charles Meertens, Fran Boler, and M. Meghan Miller
UNAVCO, Geodetic Data Services, Boulder, United States

UNAVCO community investigators are actively engaged in using space and terrestrial geodetic techniques to study earthquake processes, mantle properties, active magmatic systems, plate tectonics, plate boundary zone deformation, intraplate deformation, glacial isostatic adjustment, and hydrologic and atmospheric processes. The first GPS field projects were conducted over thirty years ago, and from the beginning these science investigations and the UNAVCO constituency as a whole have been international and collaborative in scope and participation. Collaborations were driven by the nature of the scientific problems being addressed, the capability of the technology to make precise measurements over global scales, and inherent technical necessity for sharing of GPS tracking data across national boundaries. The International GNSS Service (IGS) was formed twenty years ago as a voluntary federation to share GPS data from now hundreds of locations around the globe to facilitate realization of global reference frames, ties to regional surveys, precise orbits, and to establish and improve best practices in analysis and infrastructure. Recently, however, numbers of regional stations have grown to the tens of thousands, often with data that are difficult to access. UNAVCO has been working to help remove technical barriers by providing open source tools such as the Geodetic Seamless Archive Centers software to facilitate cross-project data sharing and discovery and by developing Dataworks software to manage network data. Data web services also provide the framework for UNAVCO contributions to multi-technique, inter-disciplinary, and integrative activities such as CoopEUS, GEO Supersites, EarthScope, and EarthCube. Within the geodetic community, metadata standards and data exchange formats have been developed and evolved collaboratively through the efforts of global organizations such as the IGS. A new generation of metadata and data exchange formats, as well as the software tools that utilize these formats and that support more efficient exchange of the highest quality data and metadata, are currently being developed and deployed through multiple international efforts.