The IGS Global Data Center at the CDDIS – an Update

Carey Noll
Code 922, NASA GSFC, Greenbelt MD 20771, USA

Maurice Dube
Raytheon Information Technology and Scientific Services, Greenbelt MD 20770, USA

ABSTRACT – *The Crustal Dynamics Data Information System (CDDIS) has served as a global data center for the International GPS Service (IGS) since its start in June 1992, providing on-line access to data from over 175 sites on a daily basis. This paper will present information about the GPS and GLONASS data and products archive at the CDDIS. General information about the system and its support of other international space geodesy services (the ILRS, IVS, IGLOS-PP, and DPE) will also be discussed.*

1 Background

The Crustal Dynamics Data Information System (CDDIS) was established in 1982 as a dedicated data bank to archive and distribute all Crustal Dynamics Project-acquired data and information about these data. Today, the CDDIS continues to serve as the NASA archive and distribution center for space geodesy data, particularly GPS, GLONASS, laser ranging, DORIS and VLBI data. Most data sets are accessible to scientists through ftp and the World Wide Web (WWW); general information about all data is accessible via the web.

The CDDIS has served as a global data center for the International GPS Service (IGS) since its start in June 1992, providing on-line access to GPS data from nearly 175 sites on a daily basis as well as the products derived by the IGS Analysis Centers from these data. In 1998, the CDDIS was selected to serve as a global data center for the International GLONASS Experiment (IGEX-98), as well as a data center for the International Laser Ranging Service (ILRS) and the International VLBI Service for Geodesy and Astrometry (IVS).

2 Current Status

The CDDIS computer facility consists of a Compaq AlphaServer 4000 with 512 Mbytes of memory and running the UNIX operating system. All GPS data and product files are archived in a single filesystem, accessible through anonymous ftp, and are stored in UNIX compressed format, using lowercase filenames (with the exception of the *.Z* indicating a compressed file). Approximately 120 Gbytes of magnetic disk storage are devoted to the archive of GPS data and products; an additional 25 Gbytes are allocated to the archive of GLONASS data and products. Additional disk space is utilized by the

ILRS, IVS and DORIS Pilot Experiment for the archive of laser, VLBI, and DORIS data and products.

2.1 GPS Data

The CDDIS processes approximately one Mbyte/site/day of daily GPS data files. These data are delivered by operational and regional data centers into individual accounts on the CDDIS server. These daily GPS data files consist of observation data in both RINEX and compact RINEX formats as well as broadcast ephemeris and meteorological data in RINEX format. Automated routines peruse the data center accounts on a regular basis and archive any new data to on-line, publicly accessible data directories. Each file archived at the CDDIS is quality-checked using UNAVCO's TEQC software; the resulting output files from TEQC are also stored on-line. Metadata is extracted from the GPS data and an on-line data base inventory is maintained to keep track of all data received. Daily status files are generated with information extracted from the RINEX headers of the daily GPS data; this information includes receiver and antenna type, antenna height, cycle slip statistics, the hour delay in data delivery, and the version number of the data (which is incremented when replacement data are supplied by the operations centers).

The ephemeris data files for a given day are merged into a single file that contains the orbit information for all GPS satellites for the day. Users can thus download this single daily file instead of all broadcast ephemeris files from the individual stations.

On average, 36 percent of all data are available to the IGS analysis centers and GPS user community within one hour of the end of the observation day; sixty percent are available within three hours and seventy percent are available within six hours.

2.2 GPS Products

The archive of GPS products at the CDDIS consists of orbit, clock and ERP products produced by the seven IGS analysis centers, as well as the weekly precise combination generated by the IGS Analysis Center Coordinator. SINEX solutions of station positions are routinely produced by six Associate Analysis Centers on a weekly basis. A combined solution is generated by the IGS Reference Frame Coordinator and forwarded to the CDDIS for archive. Five AACs produce daily files of global ionosphere maps of total electron content (TEC). A combined troposphere product in the form of zenith path delays is generated on a weekly basis by GFZ. Both the ionosphere and troposphere products are archived at the CDDIS and accessible to the user community through anonymous ftp.

3 Recent Developments

The on-line archive of GPS data at the CDDIS consists of daily GPS data in RINEX format from Jan. 01, 1998 through the present. Older GPS data are stored off-line and can be requested for on-line access. The staff is currently migrating these data to CD-

ROM with plans to populate a 600-platter jukebox in the near future. Once this hardware is operational, the entire GPS archive of the CDDIS will be accessible on-line.

The CDDIS began archiving hourly, 30-second GPS data in 1998; these data are available within minutes after the end of the hour and are retained on-line for three days. The same data in the form of the daily "classic" IGS data product continue to be available for all sites supplying hourly data and thus the individual hourly files are of little use after the daily file has been archived. At this time, approximately sixty stations are delivering hourly data files to the CDDIS; these data are typically available within five to fifteen minutes past the hour.

4 Future Plans

The CDDIS plans to support the Call for Proposal issued by the IGS for low-Earth orbiter (LEO) missions by providing an archive of high-rate GPS data for a subset of the IGS network. Furthermore, the CDDIS will archive data from on-board GPS receivers.

In 1998, the CDDIS expanded its archive to include GLONASS data and products in support of IGEX-98; the CDDIS has proposed to continue this activity under the auspices of the International GLONASS Service – Pilot Project (IGLOS-PP). IGLOS is a pilot project within the framework of the IGS and is scheduled to commence in late 2000. In support of this activity, the CDDIS will continue the archive of GLONASS data and products and will begin efforts to incorporate these data and products into the existing IGS data and product infrastructure.

5 Contact Information

To obtain more information about the CDDIS, contact:

Ms. Carey E. Noll
Manager, CDDIS
Code 920.1
NASA GSFC
Greenbelt, MD 20771
USA

Phone: (301) 614-6542
FAX: (301) 614-5970
E-mail: *noll@cddis.gsfc.nasa.gov*
WWW: *http://cddisa.gsfc.nasa.gov*