



The Crustal Dynamics Data Information System (CDDIS) - VLBI Updates for 2025



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Abstract

The Crustal Dynamics Data Information System (CDDIS), established in 1982, is NASA's archive for space geodesy and geodynamics. Over decades, the CDDIS has grown and evolved alongside space geodesy communities, such as the DORIS, GNSS, SLR, and VLBI user communities. With this growth, the CDDIS has worked to ensure new updates and releases of data and products are made known to the general user community. Inquiries on the use of data and product have become more common from various agencies. This poster provides an overview of these items.

VLBI Downloads from the CDDIS

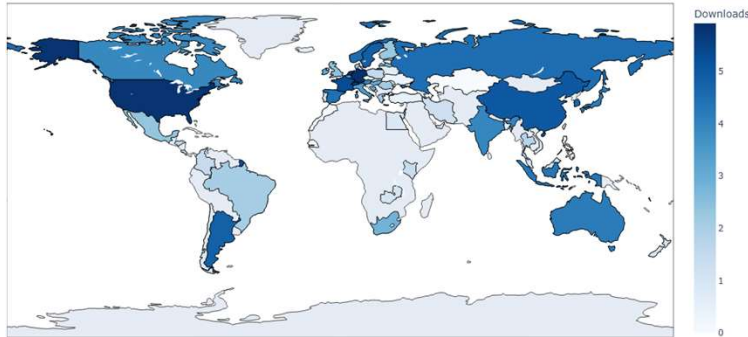


Figure 1: 2024 Downloads for VLBI Files Based on Country Code

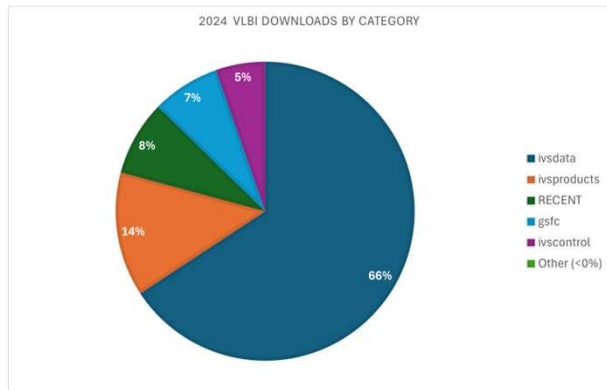


Figure 2: 2024 Downloads for VLBI Files Based on Directory Structure

vgosDB Downloads from the CDDIS

The CDDIS started accepting vgosDB files in 2019 with data spanning from 1979 to current. It is one of our most popular downloads.

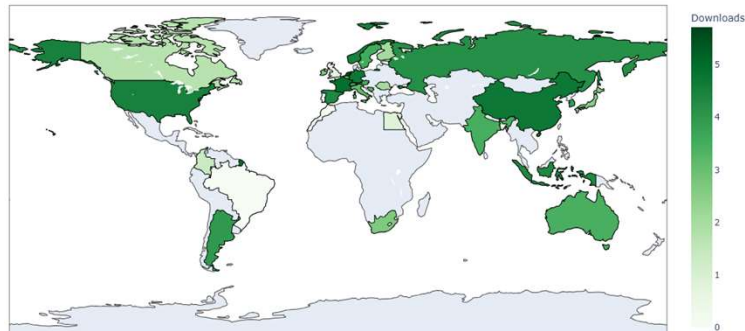


Figure 3: 2024 Downloads for VLBI vgosDB Based on Country Code

Cloud Transition Update

The CDDIS has paused its transition to the Earthdata Cloud until further notice.

Please note that, even when the CDDIS transitions to the cloud, users will still be able to download data to their servers and the original archive structure will still be maintained. NASA's ESDS is also investing in helping scientists transition to the cloud through training initiatives.

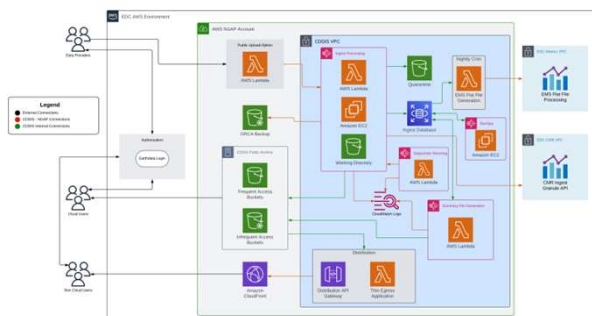


Figure 4: CDDIS Flow Diagram for onboarding to the Cloud

Filename Changes

The future is longer than the past, and standards need to evolve to provide support for concepts of operation that were not envisioned when the original standard was created. Recognizing this, and to prepare for the future of VLBI observations coordinated by the International VLBI Service for Geodesy and Astrometry (IVS), the IVS developed a new naming convention for use with vgosDBs and SINEX files, which are served on CDDIS. The previous convention included the date of a session formatted as yyMMdd (e.g., 25APR08) and a two-character database code. The new convention takes a similar, yet more flexible, approach, using the date of a session formatted as yyyyymmdd (e.g., 20250408) and the session code, the unique identifier of the session which can be up to 12 characters long. The new convention was updated to support:

- operations for hundreds of future years (by extending from 2-digit to 4-digit), and
- several sessions per day (by using the session code in the name and extending the possible length of the session code from 6 to 12 characters).

With these changes, the new convention:

- allows for more flexibility in the planning of sessions and in concepts of operations due to the larger set of possible names, and
- simplifies file handling due to the ability to naively sort the files and extract a session's unique identifier (the session code) from the file name.

File Type	Former Convention	New Convention
vgosDB	yyMMdddCC.tgz	yyyyymmdd-<ssssss>.tgz
Int SINEX	yyMMdddCC_aaaccccc.sni.gz	yyyyymmdd-<ssssss>_aaaccccc.sni.gz
Daily SINEX	yyMMdddCC_aaaccccc.snx_.gz	yyyyymmdd-<ssssss>_aaaccccc.snx.gz

Table 1: Changes to Filename Conventions. These are noted on the IVS CC website: https://ivscg.gsfc.nasa.gov/products-data/DataCenter_File_Conventions.pdf

These changes necessitated the definition of a version 2.0 format of the IVS master file, which was released in November 2022 (see "Mapping Session Codes to Session Types for the v2.0 Master File Format", Dieck et al, IVS 2024 General Meeting Proceedings, 2025). The CDDIS hosts all v2.0 master files and parses them to verify incoming files where the session code is in the filename.

Beginning with 2023 all vgosDBs from 2023 and beyond that were submitted to CDDIS were required to use the new naming convention. The SINEX files are contributed by IVS Analysis Centers in either naming convention depending on the current needs of the Analysis Center. The CDDIS is capable of ingesting SINEX files in both formats and currently allows for both.

Looking to the near future, IVS Analysis Centers are expected to submit SINEX files in the new convention the next time they update to a newer solution. The CDDIS is ready to ingest those files. Once all ACs move to the new convention, uploads of SINEX files in the old convention will not be allowed. In 2025, the CDDIS will support the renaming of all the vgosDBs held in the IVS data centers from the old convention to the new convention. During the renaming, inconsistencies within some IVS vgosDBs will be corrected. These are:

- a mismatch between the session code embedded in the vgosDB and the one in the name of the vgosDB (139 vgosDBs), and
- spaces that need to become underscores within the station names in the Head.nc file's StationList variable (1966 vgosDBs).

Months after this activity is complete, the IVS data centers will coordinate the removal of all vgosDBs in the old convention.

Web Unification and Impact on DOIs

NASA's Web Unification Project seeks to consolidate all Earth Science Data Systems (ESDS) into a single website to allow users to be able to search across NASA's Distributed Active Archive Centers (DAACs).

The CDDIS is expected to fully transition from <https://cddis.nasa.gov/> to <https://www.earthdata.nasa.gov/> during the summer of 2025. Impacted items include the DOI Landing Pages and web content on the CDDIS website. The website content is subject to change before that time but the examples below are general enough that they should remain the same. Redirects from the original webpages will be available to point to the new webpages.

The archive will remain: <https://cddis.nasa.gov/archive/>.

For additional information on the Web Unification Project's impact on the CDDIS, please see: https://cddis.nasa.gov/Web_Unification.html.



VLBI page on Earthdata

Finding VLBI Data Holdings and DOIs on the Earthdata

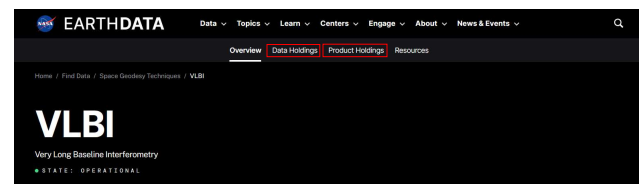


Figure 5: Screenshot of VLBI Main Page

From the VLBI page on Earthdata, you can select "Data Holdings" or "Product Holdings" to obtain a description and list of file types available on the CDDIS.

Data Summary

The Very Long Baseline Interferometry (VLBI) data are archived in experiment files, organized by experimental session and frequency band. These experiment files are available in two formats, designed for use by different processing packages: binary databases (Goddard database format) and an ASCII format (NGS card). Multiple versions of the binary databases are retained in the IVS archives; the NGS card version of the experiment data is created from the last updates made to the databases.

Data Holdings

- Level1A Correlator output
- Level2 vgosDB format data
- VLBI DB data
- VLBI NGS data
- VLBI Auxiliary Files

Spatial Coverage

- List of IVS VLBI sites
- Map of IVS VLBI sites

Temporal Coverage

- Experiment files from 1979 through present; master schedules can be found at: <https://cddis.nasa.gov/archive/vlbi/ivscontrol>

Data Volume

- Experiment files (Binary Goddard database format): ~10 Kbytes-6Mbytes (compressed)
- Experiment files (ASCII NGS card format): ~10-250 Kbytes (compressed)

Figure 6: Screenshot of Data Holdings Page: Data Summary Section

On the "Data Holdings" or "Product Holdings" page, navigate down to Data/Product Summary and a list of holdings will be available. To reach the landing page with the DOIs, select the applicable link and that will take you to the landing page with DOIs.