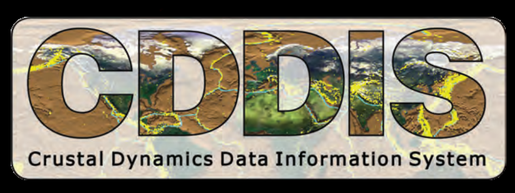
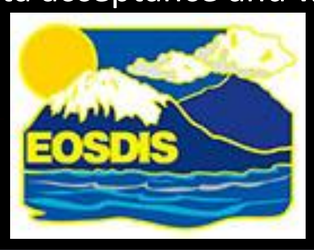
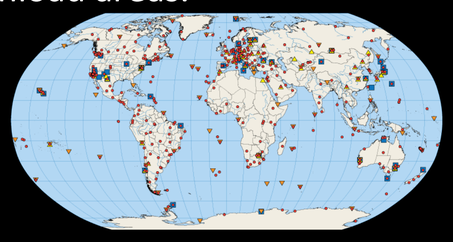
Important Upcoming Architecture and User Changes at the CDDIS

ABSTRACT: The Crustal Dynamics Data Information System (CDDIS) as NASA's premiere data repository of space geodesy and space geodynamical data is well known throughout many scientific communities, including the IGS. As such its popularity has soared over the past several years to the point where in 2015 over 1.2 billion downloads of data were accomplished in ftp alone. As CDDIS's scientific importance has grown, its architecture has had to change to support both current and expected new demands. In addition as part of the NASA's Earth Observing System Data Information System (EOSDIS), CDDIS must enact policies and procedures as part of the larger EOSDIS community. This poster will highlight some of the recent architectural changes at CDDIS that have been or will be enacted over the coming year. With an emphasis on one of the most important those of CDDIS's enablement of the EOSDIS Earthdata Login for its data acceptance and web download areas.







Patrick Michael - Patrick.Michael@nasa.gov
Carey Noll - Carey.Noll@nasa.gov

NASA Goddard Space Flight Center
Code 690.1, Greenbelt, MD 20771, USA

Background:

- The Crustal Dynamics Data Information System (CDDIS) is NASA's active archive of space geodesy data, products, an information (Global Navigation Satellite System/GNSS, Satellite Laser Ranging/SLR, Very Long Baseline Interferometry/VLBI, and Doppler Orbitography and Radio-positioning Integrated by Satellite/DORIS).
- Data archiving and distribution support to a global research community for over thirty years
- Supported since 2009 through NASA's Earth Observing System Data and Information System (EOSDIS) and is one of its 12 distributed data centers, serving a wide, diverse user community.
- CDDIS's largest user community comes from the International Association of Geodesy (IAG).
- Over the past 7 years CDDIS has experienced double digit growth culminating in over 1.2B downloads and over 130TB of data transferred in 2015.

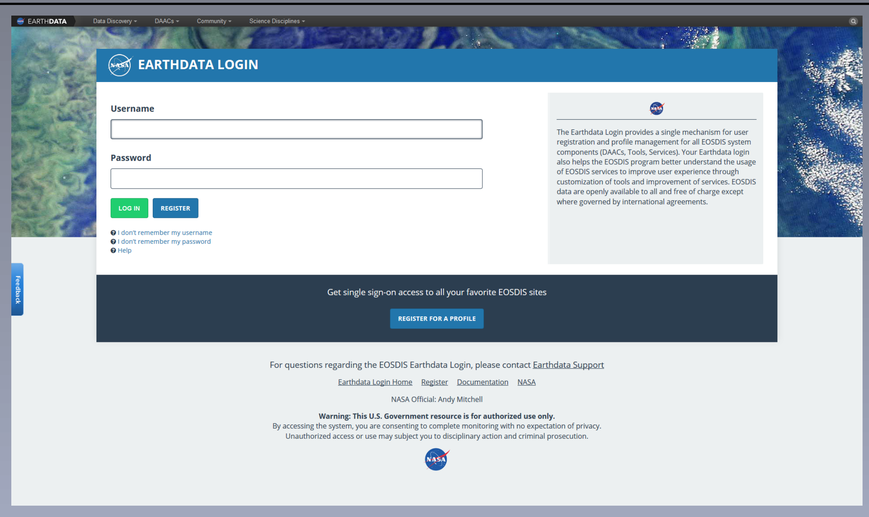


Figure 2 – Common Earthdata Login Interface

Integrating CDDIS Operations into the EOSDIS Organization:

- Overall data flow between suppliers and users does not change (see Figure 1)
- Facilities/Architecture Improvements – expected completion May 2016
  - ➢ All new IT infrastructure – design uptime 4 "nines"
  - ➢ Multiple redundant 40Gb networks directly connected to the Internet2
  - ➢ Both production and disaster recovery (DR) system located at different locations
  - ➢ Unified storage across both production & DR systems
- User Integration and Search Capability – common login & search
  - ➢ Earthdata login across all CDDIS products – see Figure 2 for common interface
    - ➢ Ntrip Real-Time – in production (see real-time poster)
    - ➢ New data delivery (upload) – in beta see section below
    - ➢ HTTP access to the CDDIS archive – in development – Dec 2016
  - ➢ Earthdata search client integration within the CDDIS website. Search metadata across all 12 EOSDIS DAACs – Exploring Implementation Fall 2016 (see Figure 3)

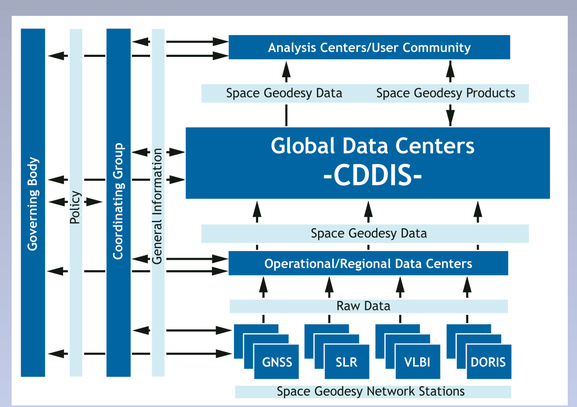


Figure 1 – CDDIS Data Flow

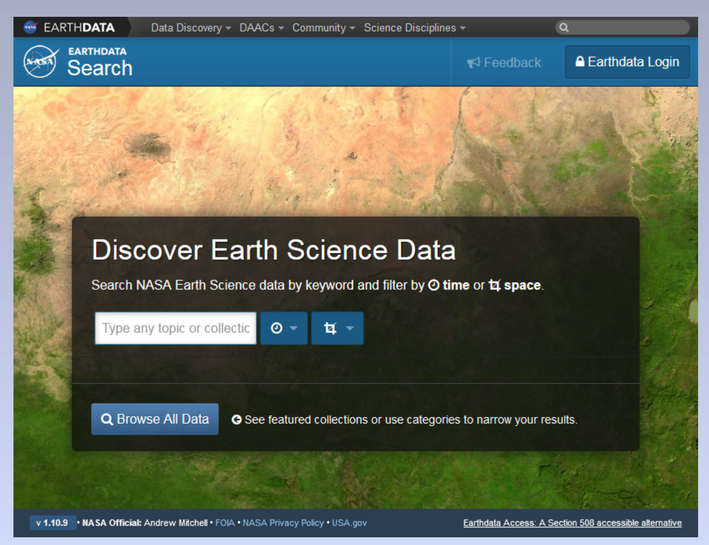


Figure 3 – Common Earthdata Search Interface

New Mandatory File Upload Procedure:

- NASA mandated all non-secure FTP traffic to be eliminated
- Therefore, all FTP uploads go away with transfer to new system Apr/May 2016
- New file upload system already in beta testing with some users
- Both web and command line interfaces available
- Utilizes Earthdata login for ALL logins – see Figure 2 login screen
- Users will be required to register with EOSDIS for a user id
- Web interface allows interactive uploads – see Figure 3
- Command line interface for bulk uploads & scripting, see Figure 1
- Curl is the standard program for command line access but any program that can do HTTP GET and POST are useable
- Sample code (Java, bash) provided for bulk uploading & scripting. See Figure 4 for Java client example.
- Next beta release will be opened up to current suppliers middle of February.

```
> java CurlClient
Usage:  java CurlClient <homespace> <directory containing files> <filepattern to upload> <fileType gnss/doris/slr> <data parameters> <isMgex>
For data parameters values depend on data type.
      For 'GNSS' values can be:  daily, hourly or highrate
      For 'SLR' values can be:  Fr or Npt
      For 'DORIS' values can be:  CRYOSAT-2, ENVISAT, HY-2A, JASON, JASON-2, SARAL, SPOT-2, SPOT-3, SPOT-4, SPOT-5, TOPEX
>
>
>
> java CurlClient /Users/nathanpollack/workspace-sts-3.6.1.RELEASE/FileUploadURSClient/src ~/cddis/dataIngest/testIngestFiles/ 15g gnss daily false
Welcome to CDDIS File Upload
You successfully uploaded 24 files, out of 24 selected
>
```

Figure 4 – Java Client Upload Example

Figure 3 – Upload Web Interface

HTTP Access to the CDDIS Archive:

- Access to the full CDDIS archive through http. Same structure as FTP access
- Earthdata login expected full implementation December 2016
- Just as efficient as ftp transfer without the firewall/router issues of FTP
- FTP access to CDDIS archive continues but users encouraged to explore http capabilities.

```
>$ curl -n -L -c .urs_cookies -b .urs_cookies http://cddis-basin.gsfc.nasa.gov/CDDIS_FileUpload/login
Welcome to CDDIS File Upload
>$
>$ curl  -X POST -c .urs_cookies -b .urs_cookies -n -F "fileType=GNSS" -F "mgexFile=false" -F "gnssFileType=daily" -F "file[]=@./cddis/dataIngest/test2IngestFiles/zim2001a.15g.Z" -F "file[]=@./
cddis/dataIngest/test2IngestFiles/zim2001b.15g.Z" -F "file[]=@./cddis/dataIngest/test2IngestFiles/zim2001c.15g.Z" -F "file[]=@./cddis/dataIngest/test2IngestFiles/zim2001d.15g.Z" -F "file[]=@./
cddis/dataIngest/testIngestFiles/zim2001a.15g.Z" -F "file[]=@./cddis/dataIngest/testIngestFiles/zim2001b.15g.Z" -F "file[]=@./cddis/dataIngest/testIngestFiles/zim2001c.15g.Z" -F "file[]=@./cddis/
dataIngest/testIngestFiles/zim2001g.15g.Z" -F "file[]=@./cddis/dataIngest/testIngestFiles/zim2001e.15g.Z" -F "file[]=@./cddis/dataIngest/testIngestFiles/zim2001f.15g.Z" -F "file[]=@./cddis/
dataIngest/testIngestFiles/zim2001g.15g.Z" -F "file[]=@./cddis/dataIngest/testIngestFiles/zim2001h.15g.Z" -F "file[]=@./cddis/dataIngest/testIngestFiles/zim2001i.15g.Z" -F "file[]=@./cddis/
dataIngest/testIngestFiles/zim2001j.15g.Z" -F "file[]=@./cddis/dataIngest/testIngestFiles/zim2001k.15g.Z" -F "file[]=@./cddis/dataIngest/testIngestFiles/zim2001l.15g.Z" -F "file[]=@./cddis/
dataIngest/testIngestFiles/zim2001m.15g.Z" -F "file[]=@./cddis/dataIngest/testIngestFiles/zim2001n.15g.Z" -F "file[]=@./cddis/dataIngest/testIngestFiles/zim2001o.15g.Z" -F "file[]=@./cddis/
dataIngest/testIngestFiles/zim2001p.15g.Z" -F "file[]=@./cddis/dataIngest/testIngestFiles/zim2001q.15g.Z" -F "file[]=@./cddis/dataIngest/testIngestFiles/zim2001r.15g.Z" -F "file[]=@./cddis/
dataIngest/testIngestFiles/zim2001s.15g.Z" -F "file[]=@./cddis/dataIngest/testIngestFiles/zim2001t.15g.Z" -F "file[]=@./cddis/dataIngest/testIngestFiles/zim2001u.15g.Z" -F "file[]=@./cddis/
dataIngest/testIngestFiles/zim2001v.15g.Z" -F "file[]=@./cddis/dataIngest/testIngestFiles/zim2001w.15g.Z" -F "file[]=@./cddis/dataIngest/testIngestFiles/zim2001x.15g.Z"  http://cddis-
basin.gsfc.nasa.gov/CDDIS_FileUpload/upload/
You successfully uploaded 28 files, out of 28 selected
>$
```

Figure 1 – Upload Command Line Interface

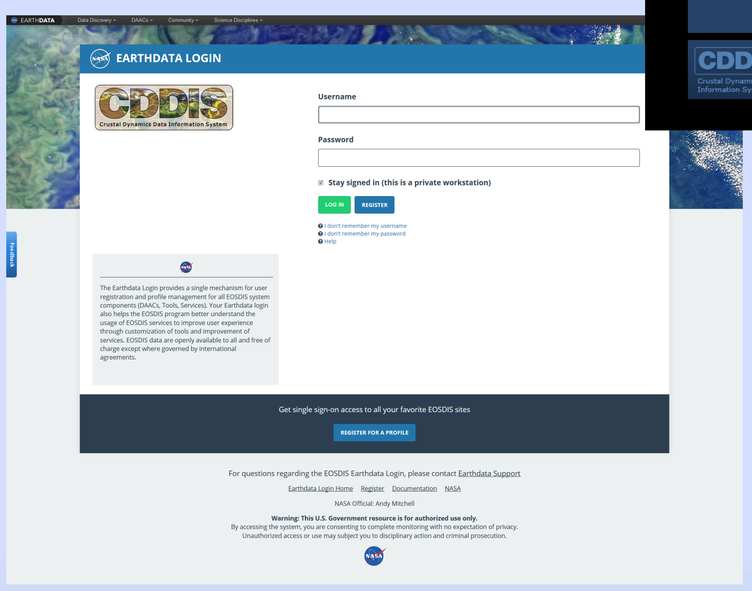
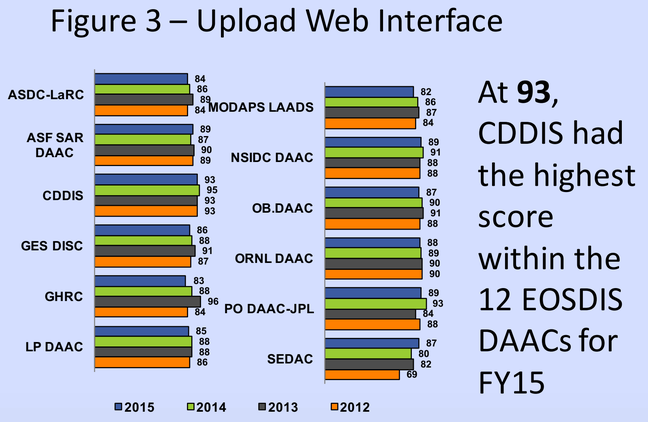


Figure 2 – Upload Web Login Screen



At **93**, CDDIS had the highest score within the 12 EOSDIS DAACs for FY15

Figure 5 – EOSDIS 12 DAACs Customer Satisfaction Index

More Information/Feedback:

- Data and products are acquired as part of NASA's Earth Science Data Systems and archived and distributed by the Crustal Dynamics Data Information System (CDDIS):
  C. Noll, The Crustal Dynamics Data Information System: A resource to support scientific analysis using space geodesy, Advances in Space Research, Volume 45, Issue 12, 15 June 2010, Pages 1421-1440, ISSN 0273-1177, DOI:10.1016/j.asr.2010.01.018.
- The staff welcomes feedback on the CDDIS and in particular the ideas expressed in this poster; contact Patrick Michael (Patrick.Michael@nasa.gov).