# PO.DAAC
# GRACE/GRACE-FO Data Access

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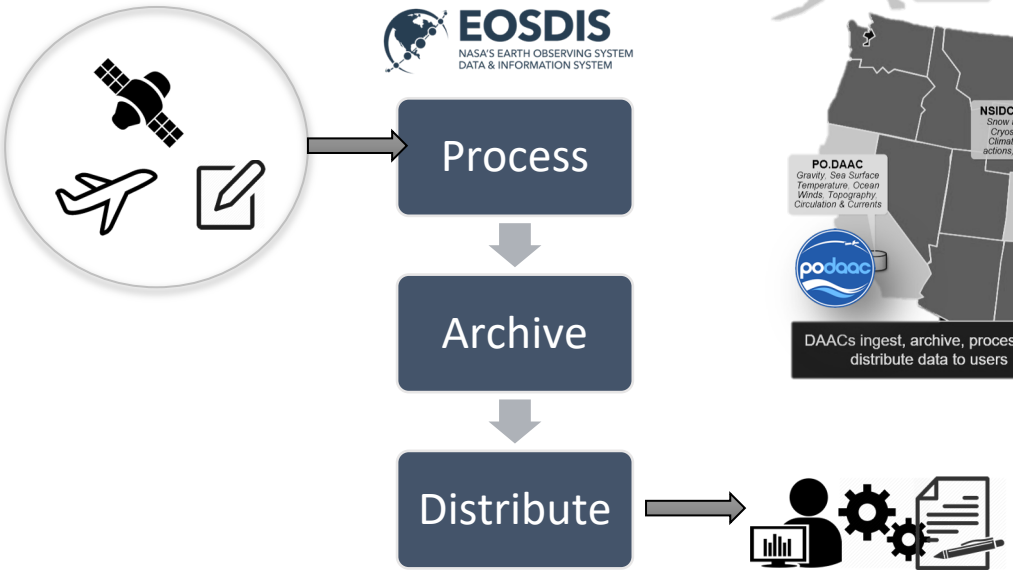
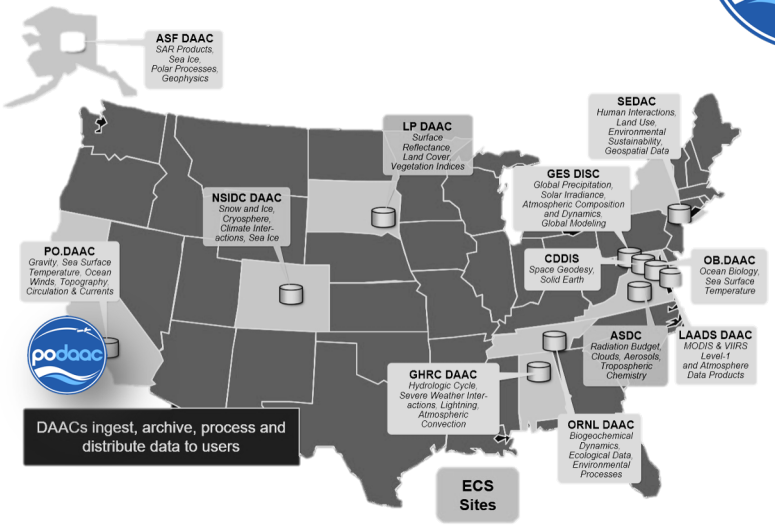
# Physical Oceanography Distributed Active Archive Center (PO. DAAC)

https://podaac.jpl.nasa.gov/



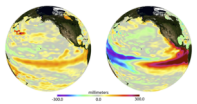




## Missions & Projects

Seasat, TOPEX/Poseidon, Jason-1, NSCAT, SeaWinds on ADEOS-II, QuikSCAT, **GRACE**, GHRSST, MEaSUREs, Aquarius, SPURS, ISS-RapidScat, AirSWOT, OMG, CYGNSS, **GRACE-FO** (2018), Jason-CS/Sentinel-6 (2020), SWOT (2021)

## Parameters

**Gravity**
Ocean Circulation & Currents
Ocean Surface Salinity
Ocean Surface Topography
Ocean Winds
Sea Surface Temperature
Hydrology



## Tools

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# GRACE/GRACE-FO Datasets at PO.DAAC

- 91 publicly accessible datasets from GRACE
  - Summarization of current products (Example Release-06 (RL06) datasets)
    - Level-1 (ASCII)
      - AOD1B_GFZ_RL06 and L1B_JPL_RL03
    - Level-2 (YAML header)
      - GAA, GAB, GAC,GAD, GSM RL06 from JPL,GFZ, CSR
    - Level-3 (MASCON)
      - JPL Tellus mascon products (MSCNv01, and MSCNv01CRIv01)

- GRACE-FO Notional Schedule status
  - *GRACE-FO Level 1 - April 2019*
  - *GRACE-FO Level 2 & 3 - June 2019*

- Services
  - PO.DAAC Drive - Replacement to FTP - All products
  - Data Transformation and Visualization - Higher level products

https://grace.jpl.nasa.gov/data/

https://podaac.jpl.nasa.gov/GRACE

# FTP Transition

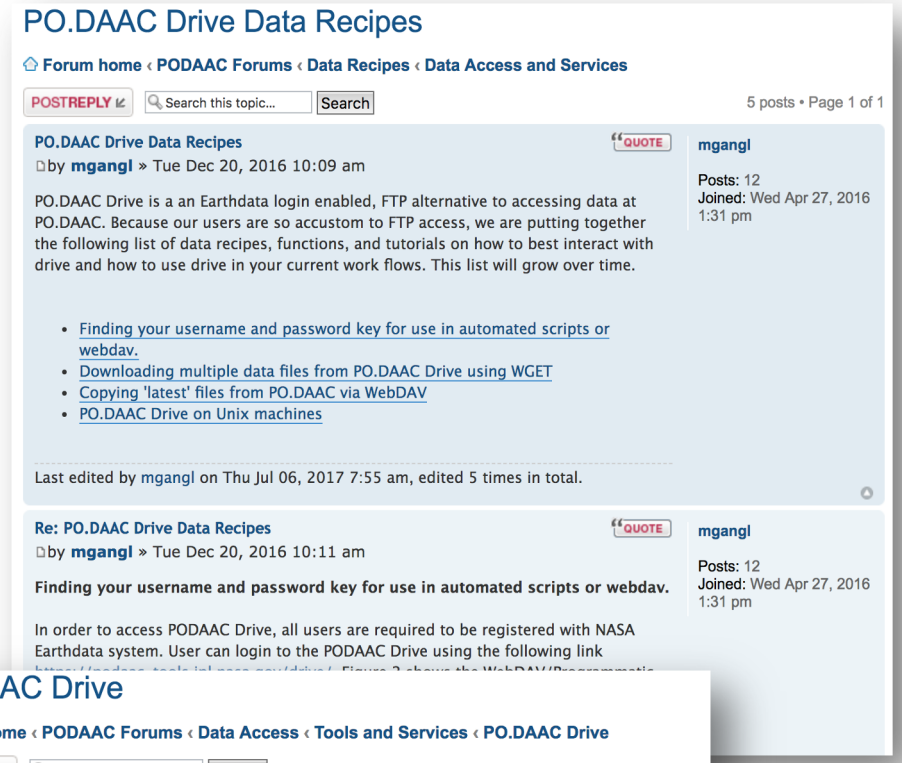
**When will FTP be deprecated at PO.DAAC?**
FTP will be shut down in spring of 2019.

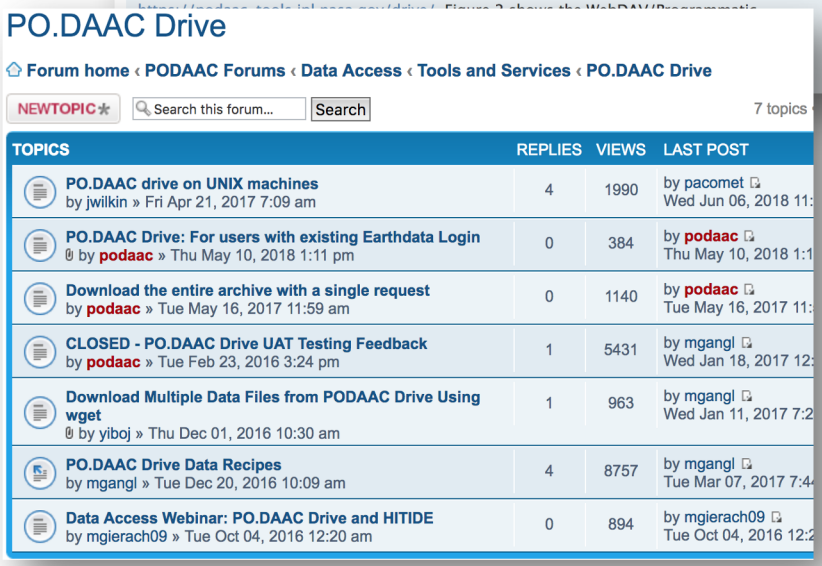
**HTTPS/Drive**
https://podaac-tools.jpl.nasa.gov/drive
Drive will provide the closest function to FTP with hierarchical file browse and can be used with rsync, curl or wget, along with other tools. It uses WebDAV so you can mount Drive to your machine.

PO.DAAC will host a webinar on **October 24, 2018**

**"Goodbye FTP, How to Access Data at PO.DAAC."**

This webinar will highlight PO.DAAC services currently available to users to assist with their migration.

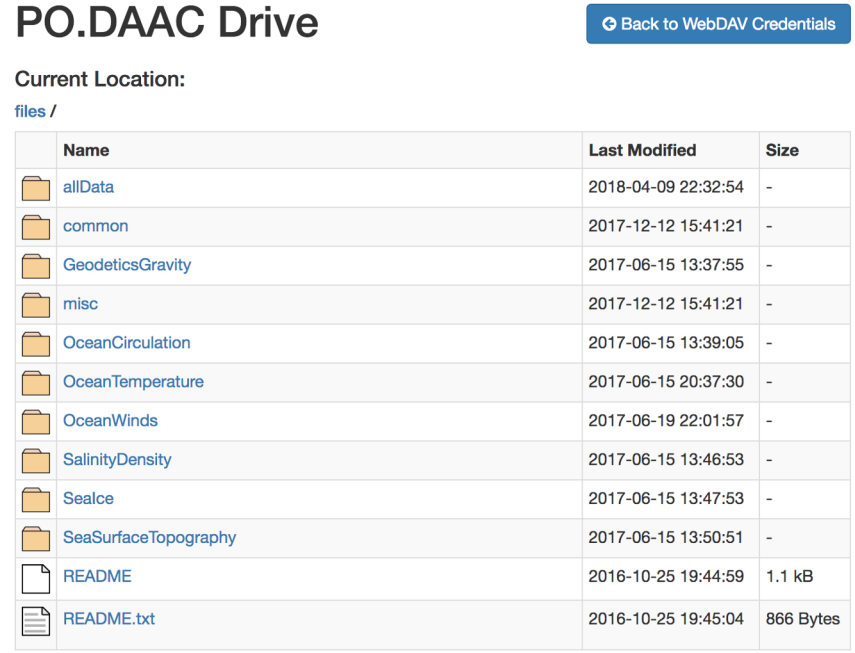


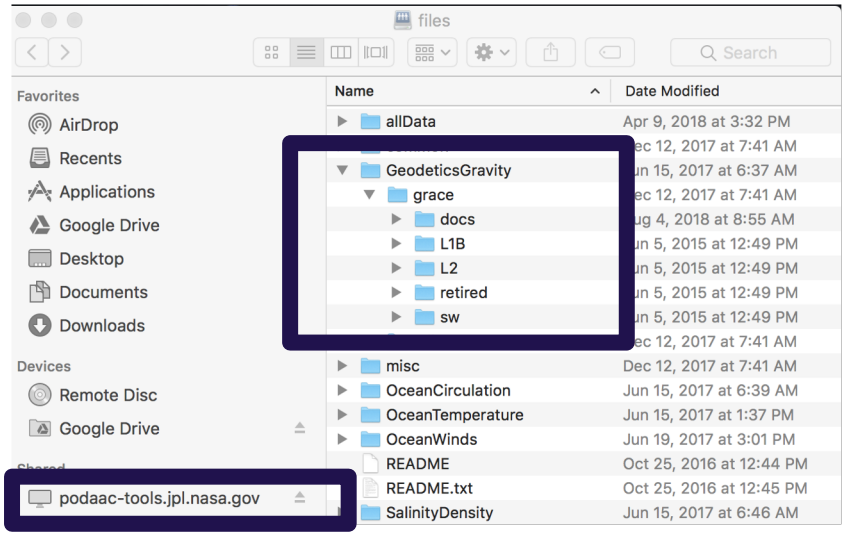



# Drive/HTTPS

https://podaac-tools.jpl.nasa.gov/drive

- FTP will be deprecated June 2019
- It will be replaced by HTTPS via Drive
  - Directory listing similar to FTP
  - Users can “mount” data like a local drive using WebDAV protocol/API
  - Can use command line access like rysnc, wget, curl, or aria2
  - Scripting capable
- Requires EarthData login
  - Same login across all DAACs - User profile and related datasets
  - Reach out to users with any updates or issues with datasets
  - Understand user demographics and access patterns in support of planning for new value-added features and services

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# Tools to access GRACE/GRACE-FO datasets

# THREDDS/OPeNDAP

PO.DAAC THREDDS Data Server - Clearance Number: CL05-0770

THREDDS Data Server

Catalog
https://thredds.jpl.nasa.gov/thredds/catalog/ncml_aggregation/GeodeticsGravity/tellus/ocean_mass/RL05/catalog.html

Dataset: RL05/GRCTellus.CSR.200208_201612.OCN.RL05.DSTvDPC1409.nc

- *Data format:* netCDF
- *Data size:* 40.18 Mbytes
- *Data type:* GRID
- *ID:* ncml_aggregation/GeodeticsGravity/tellus/ocean_mass/RL05/GRCTellus.CSR.200208_201612.OCN.RL05.DSTvDPC1409.nc

**Documentation:**

- PO.DAAC

**Access:**

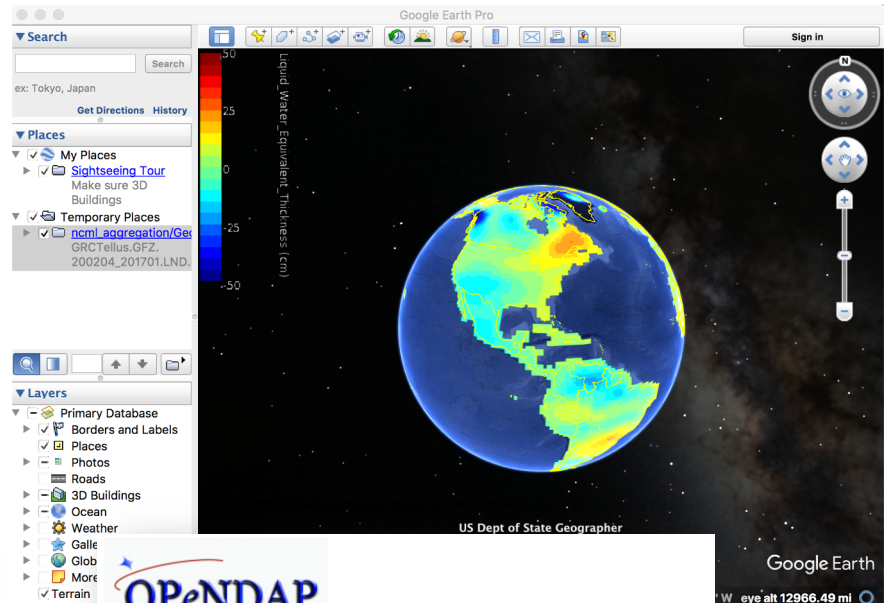
1. **OPENDAP:** /thredds/dodsC/ncml_aggregation/GeodeticsGravity/tellus/ocean_mass/RL05/GRCTellus.CSR.200208_201612.OCN.RL05.DSTvDPC1409.nc
2. **HTTPServer:** /thredds/fileServer/ncml_aggregation/GeodeticsGravity/tellus/ocean_mass/RL05/GRCTellus.CSR.200208_201612.OCN.RL05.DSTvDPC1409.nc
3. **WCS:** /thredds/wcs/ncml_aggregation/GeodeticsGravity/tellus/ocean_mass/RL05/GRCTellus.CSR.200208_201612.OCN.RL05.DSTvDPC1409.nc
4. **WMS:** /thredds/wms/ncml_aggregation/GeodeticsGravity/tellus/ocean_mass/RL05/GRCTellus.CSR.200208_201612.OCN.RL05.DSTvDPC1409.nc
5. **NetcdfSubset:** /thredds/ncss/grid/ncml_aggregation/GeodeticsGravity/tellus/ocean_mass/RL05/GRCTellus.CSR.200208_201612.OCN.RL05.DSTvDPC1409.nc
6. **NCML:** /thredds/ncml/ncml_aggregation/GeodeticsGravity/tellus/ocean_mass/RL05/GRCTellus.CSR.200208_201612.OCN.RL05.DSTvDPC1409.nc
7. **UDDC:** /thredds/uddc/ncml_aggregation/GeodeticsGravity/tellus/ocean_mass/RL05/GRCTellus.CSR.200208_201612.OCN.RL05.DSTvDPC1409.nc
8. **ISO:** /thredds/iso/ncml_aggregation/GeodeticsGravity/tellus/ocean_mass/RL05/GRCTellus.CSR.200208_201612.OCN.RL05.DSTvDPC1409.nc

**Dates:**

- 2017-05-11T21:33:31Z **(modified)**

**Viewers:**

- Godiva2 (browser-based)
- NetCDF-Java ToolsUI (webstart)
- Integrated Data Viewer (IDV) (webstart)




Specify your data's requirements and then click "Save" to download.

Selected Region:

Longitude range: [0, 360]

Latitude range: [-90, 90]

Select a Data Format:

arcGrid

Select Time:

Date/Time: 17-Feb-2004 12:00:00

Save

OPeNDAP

## Contents of /GeodeticsGravity/tellus/L3

| Name | Last Modified |
|---|---|
| gldas_monthly/ | 2016-07-08T00:47:27 |
| land_mass/ | 2016-07-07T23:34:31 |
| mascon/ | 2015-09-11T16:23:56 |
| ocean_mass/ | 2016-07-07T23:50:11 |
| ocean_mass_eofr/ | 2016-07-08T00:18:24 |

THREDDS Catalog XML

**OPeNDAP Hyrax (1.12.2)**
**Documentation**

# Tools to access GRACE/GRACE-FO datasets

## Webservices

This XML file does not appear to have any style information associated with it. The document tree is shown below.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▼<feed xmlns="http://www.w3.org/2005/Atom" xmlns:dc="http://purl.org/dc/terms/" xmlns:georss="http://www.georss.org/georss" xmlns:gml="http://www.opengis
 xmlns:opensearch="http://a9.com/-/spec/opensearch/1.1/" xmlns:podaac="https://podaac.jpl.nasa.gov/opensearch/" xmlns:time="http://a9.com/-/opensearch/ex
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  <updated>2018-10-01T19:03:09.933310Z</updated>
  <id>tag:podaac.jpl.nasa.gov,2018-10-01</id>
  ▼<author>
    <name>PO.DAAC Granule Search Service</name>
  </author>
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  <opensearch:itemsPerPage>10</opensearch:ite
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    <link href="http://podaac.jpl.nasa.gov/ws
    Metadata" type="text/xml"/>
    <link href="http://podaac.jpl.nasa.gov/ws
    type="text/xml"/>
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    <podaac:shortName>GRACE_L1B_GRAV_JPL_RL02
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   ▼<georss:where>
    ▼<gml:Envelope>
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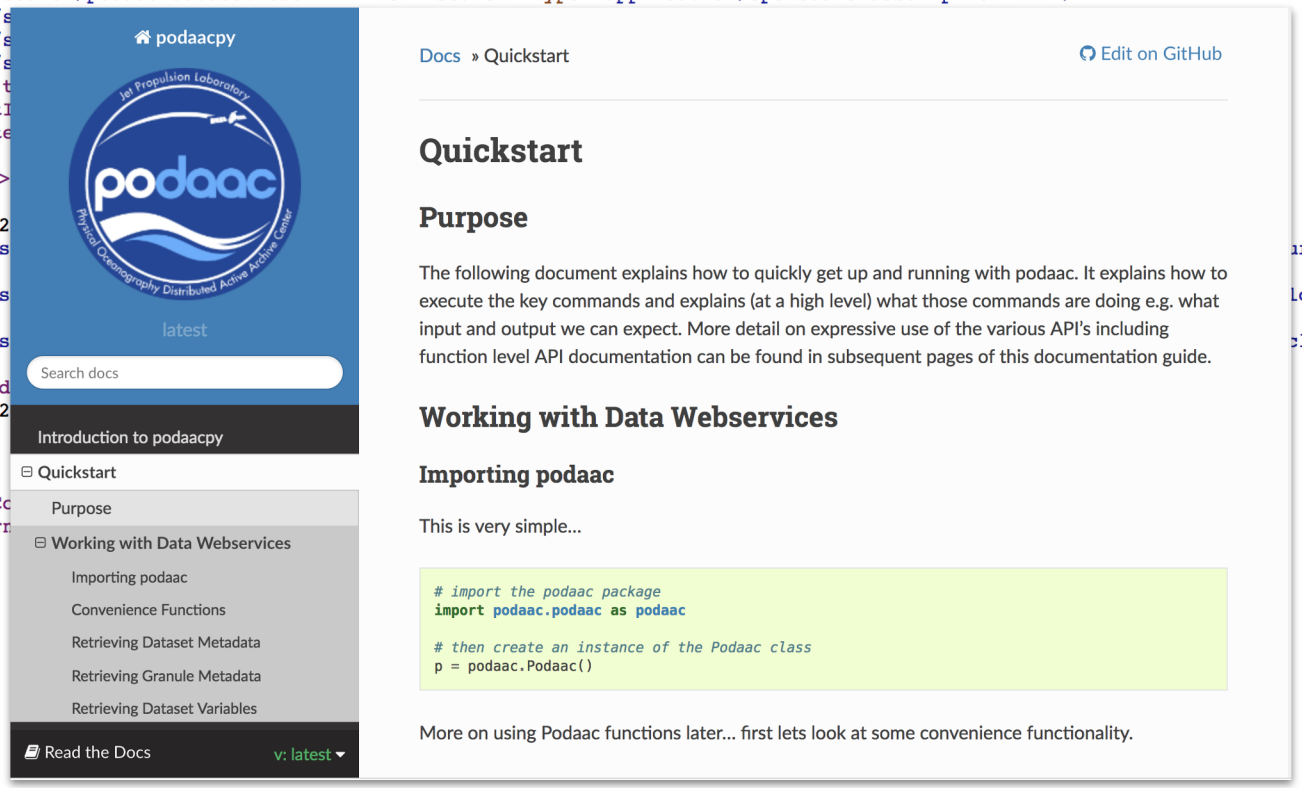
    </gml:Envelope>
```

# Community Support

View unanswered posts • View active topics

| PODAAC FORUMS | TOPICS | POSTS | LAST POST |
|---|---|---|---|
| **General Questions** | 36 | 72 | by origia<br>Sun Sep 09, 2018 11:03 pm |
| **Data Recipes**<br>Programming scripts on how to read, analyze and access PO.DAAC data | 120 | 118 | by yiboj<br>Thu Sep 20, 2018 8:54 am |
| **Data Access**<br>Tools and services | | | |
| **Ocean Stories Discuss**<br>A forum where our User co<br>Stories we've published in | | | |
| **Animations and Tutor**<br>PODAAC products and ser | | | |
| **PO.DAAC Meetings an**<br>PO.DAAC team members<br>meetings and workshops | | | |

Search found 19 matches: GRACE

Forum home

Return to advanced search

Search these results: Search

Search found 19 matches • Page 1 of 2 • 1 2

**Why do I need GRACE Tellus Mascon Scale Factors?**

Using 3-degree mascons as a basis function acts as an inherent smoother on the data. Therefore, the GRACE/Tellus Project has derived a set of scale factors (what are also referred to as global gain factors) to aid in the interpretation of signals at sub-mascon resolution. ...

by **dmoroni**
Tue Mar 08, 2016 2:26 pm

Forum: Gravity FAQ
Topic: Why do I need GRACE Tellus Mascon Scale Factors?
Replies: 0
Views: 2009

Jump to post

**Where can I obtain a list of science publications for GRACE?**

The following link provides a list of relevant GRACE and Tellus publications through peer-reviewed science journals: http://grace.jpl.nasa.gov/publications/ Note: this list is not maintained by PO.DAAC. For any questions or concerns about this list, ...

by **dmoroni**
Tue Mar 08, 2016 2:35 pm

Forum: Gravity FAQ
Topic: Where can I obtain a list of science publications for GRACE?
Replies: 0
Views: 3390

Jump to post

**Re: GRACE Global Groundwater Data**

There is no official "GRACE Global Groundwater Data". What one does is get the GRACE Total Terrestrial Water Storage Anomaly (TWSA). For example: https://podaac-

by **mgierach**
Tue Mar 27, 2018 9:03 am

Forum: General Questions
Topic: GRACE Global Groundwater

- **Recipes**
- **Dataset Highlights**
- **User feedback**
- **Annual Survey**
- **Webinar**

# YAML - GRACE

Recently released the GRACE Level-2 RL06 products in YAML format.

- GRACE_GAA_L2_GRAV_GRZ_RL06 (JPL,GFZ)
- GRACE_GAB_L2_GRAV_GRZ_RL06 (JPL,GFZ)
- GRACE_GAC_L2_GRAV_GRZ_RL06 (JPL,GFZ, CDR)
- GRACE_GAD_L2_GRAV_GRZ_RL06 (JPL,GFZ, CDR)
- GRACE_GSM_L2_GRAV_GRZ_RL06 (JPL,GFZ, CDR)

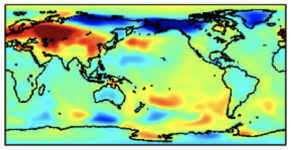
```
> undays = data['header']['global_attributes']['unused_days'][0]
> print ('Unused_days =', undays)
> Unused_days = 2003-02-08
```

**Access with code**

```
> data['datablock2'][0][3]      # value at 1st row and 4th col
> -1.00683e-11                  # result
```

See Wen-Hao Presentation Wednesday, 10th October, at 3:45 PM

# Metrics - Data citation and Usage - *Upcoming capability at PO.DAAC*



**GRACE NON-TIDAL ATMOSPHERE AND OCEAN GEOPOTENTIAL COEFFICIENTS JPL RELEASE 6.0 GAC**

SHARE THIS PAGE

https://podaac.jpl.nasa.gov/dataset/GRACE_GAC_L2_GRAV_JPL_RL

Please contact us if there are any discrepancies or inaccuracies found below.

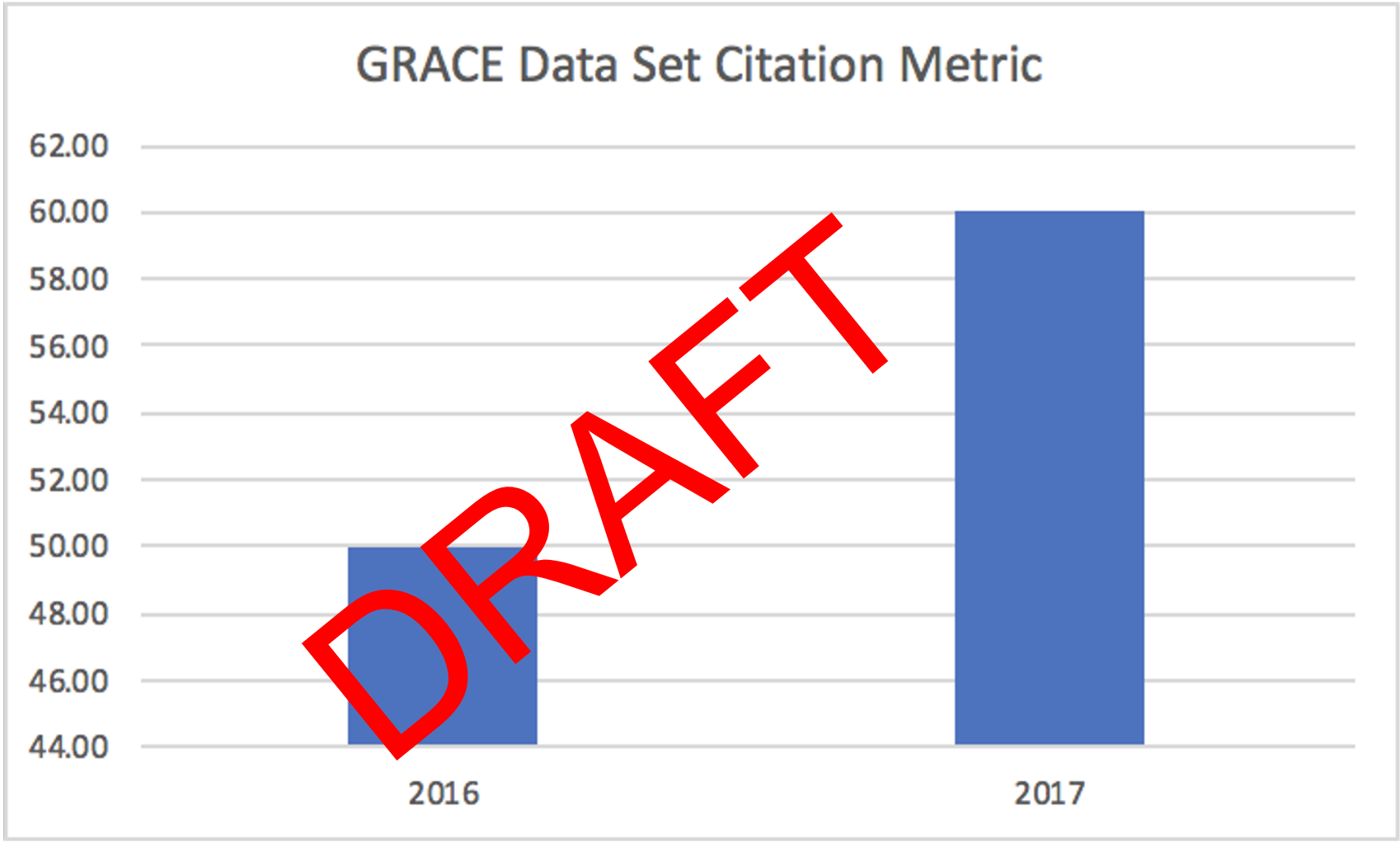
Information | Data Access | Documentation | Citation | Granule (File) Listing

**Cited *XYZ* times**
**Download *ABC* times**

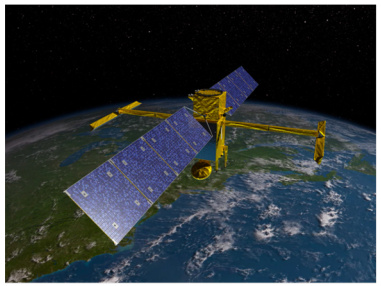
**Drill Down**

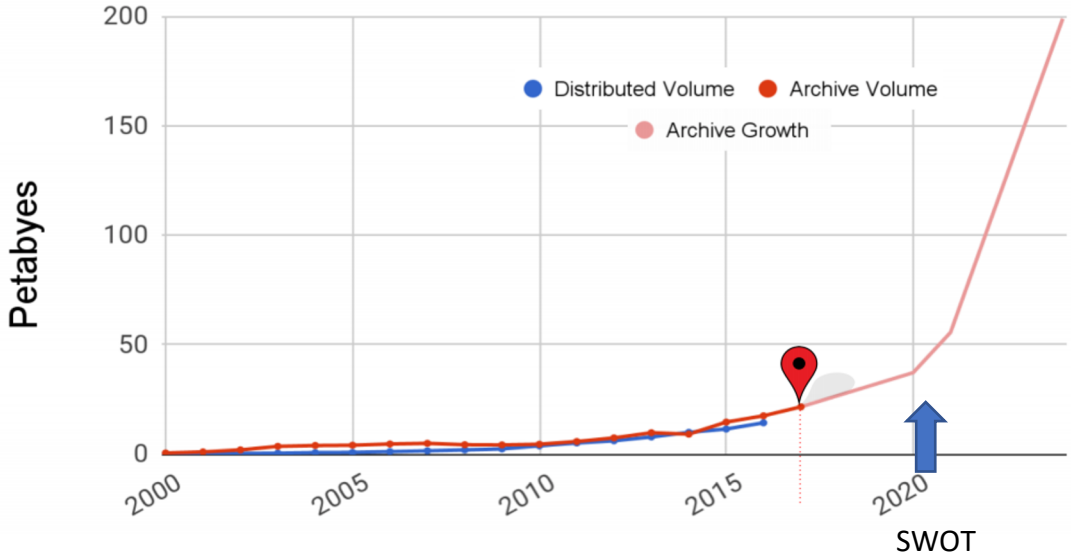
| | |
|---|---|
| **DOI** | 10.5067/GRGAC-20J06 |
| **Short Name** | GRACE_GAC_L2_GRAV_JPL_RL06 |
| **Description** | FOR EXPERT USE ONLY. This dataset contains estimates of geopotential field derived from the Gravity Recovery and Climate Experiment (GRACE) mission measurements and a non-tidal oceanic and atmospheric model produced by the NASA Jet Propulsion Laboratory (JPL). The data are in spherical harmonics averaged over approximately a month. The primary objective of the GRACE mission is to obtain accurate estimates of the mean and time-variable components of the gravity field variations. This objective is achieved by making continuous measurements of the change in distance between twin spacecraft, co-orbiting in about 500 km altitude, near circular, polar orbit, spaced approximately 200 km apart, using a microwave ranging system. In addition to these range change, the non-gravitional forces are measured on each satellite using a high accuracy electrostatic, room-temperature accelerometer. The satellite orientation and position (and timing) are precisely measured using twin star cameras and a GPS receiver, respectively. Spatial and temporal variations in the gravity field affect the orbits (or trajectories) of the twin spacecraft differently. These |

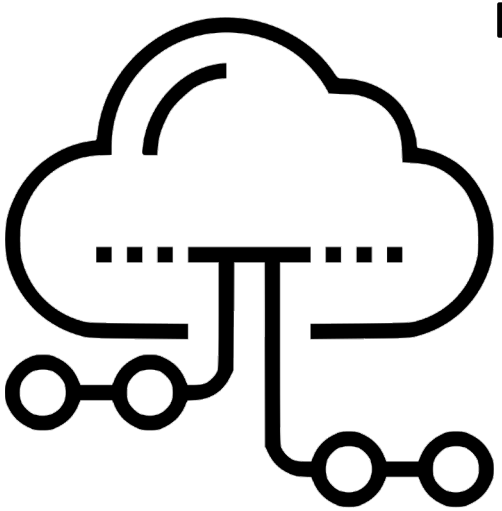
# Citation metrics - GRACE



# EOSDIS/PO.DAAC Evolution
# Cloud data access paradigm





## Data access

- Support current data access patterns out of the cloud (“download and analyze”)
- Support data access and analyze patterns in the cloud (“login and analyze”)

## User/Community Support

- Training users to data access in  the cloud
- Citation and DOI for data products
- Metrics on usage of data products
- Manuscript associated dataset publication process
- Tools (GIS/Modelling/Applications etc.)

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