

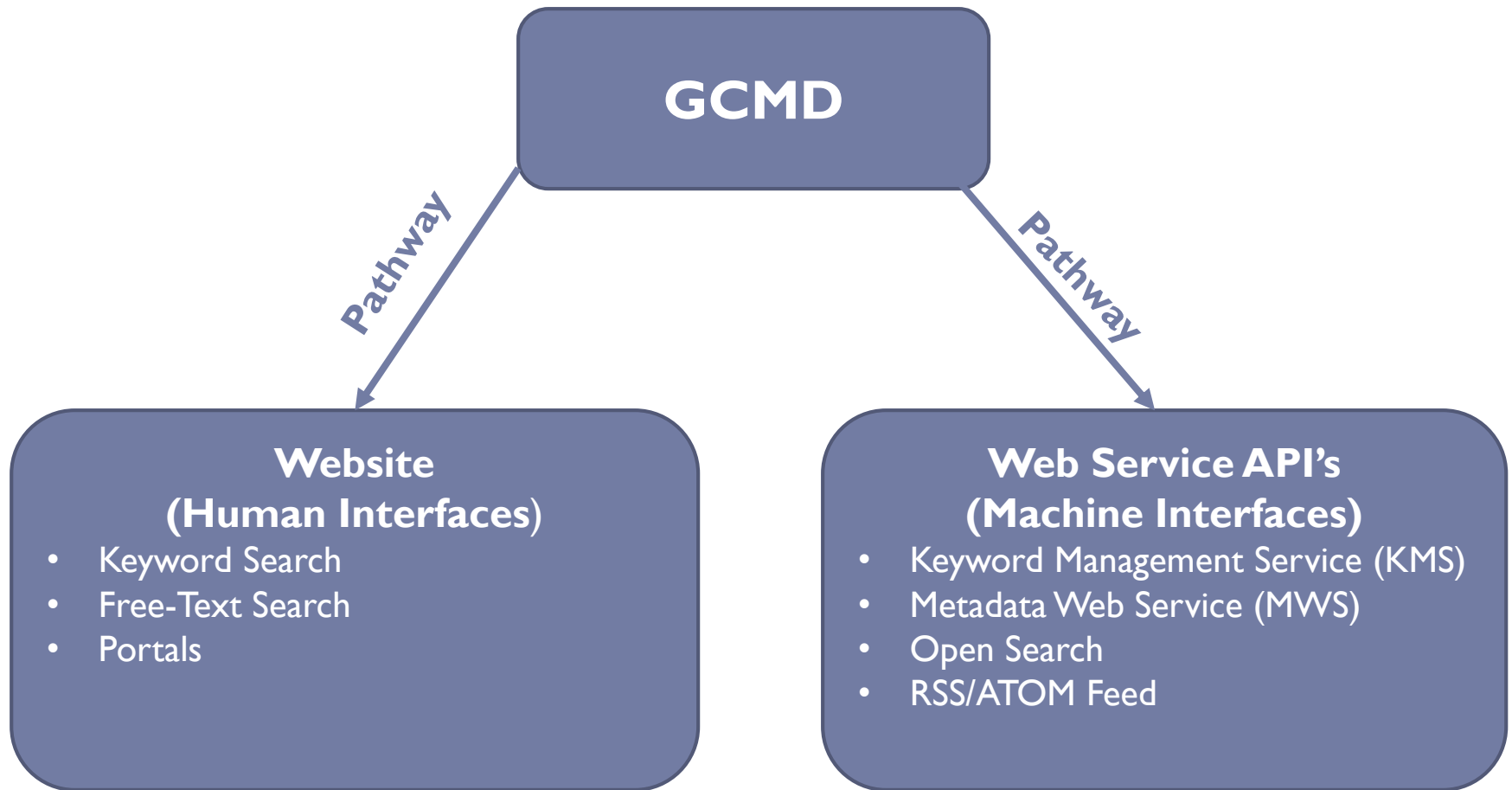


Global Change Master Directory
Discover Earth science data and services

Pathways for Discovering Earth Science Data and Services using NASA's Global Change Master Directory's (GCMD)

**Presented by Tyler Stevens, Scott Ritz, and Thomas Cherry
NASA Goddard Space Flight Center (GSFC) / Wyle Information Systems**

Pathway to Data Discovery



GCMD Mission

Assist the scientific community in the **discovery** of Earth science data, related services, and ancillary information (platforms, instruments, projects, data centers/service providers).

Provide **discovery/collection-level metadata** of Earth science resources and provide scientists a comprehensive and high quality database to reduce overall expenditures for scientific data collection and dissemination.



<http://gcmd.nasa.gov/>

Earth Science Metadata Formats (DIFs, SERFs, CDs)

▶ **Earth Science Data Set Descriptions**

- Directory Interchange Format (DIF)
- Describes Earth Science and Climate Data

▶ **Earth Science Data Service Descriptions**

- Service Entry Resource Format (SERF)
- Describes Earth science related tools, software, and models

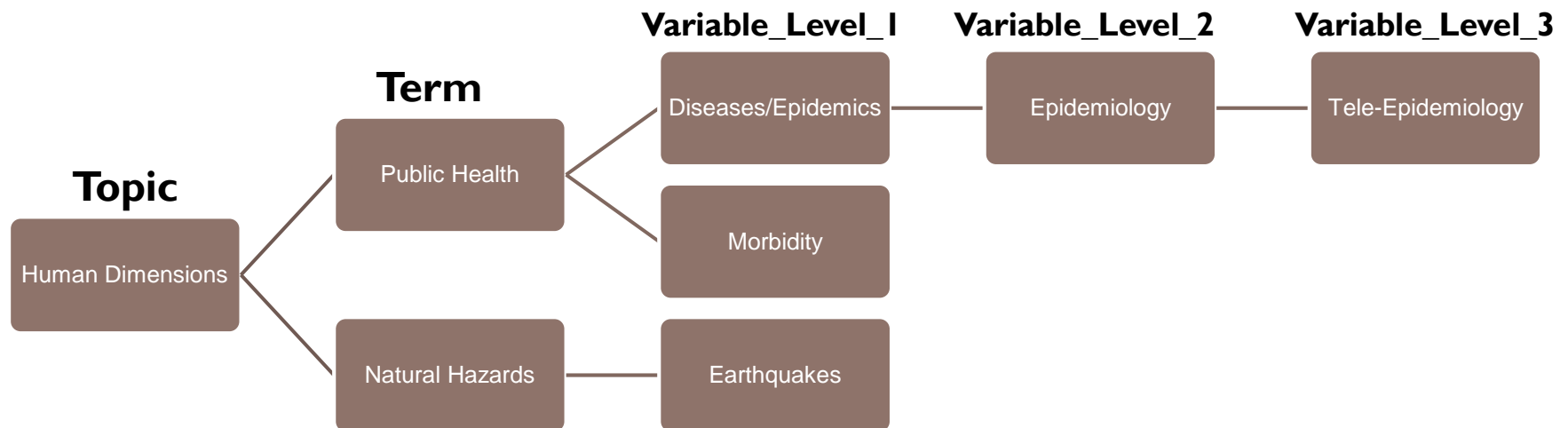
▶ **Climate Diagnostics Descriptions**

- Climate Diagnostics Format (CD)
- Describes climate visualizations

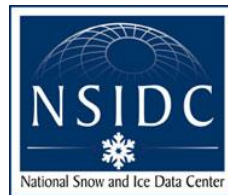
Science and Service Keywords

- ▶ The GCMD maintains a 5-level controlled keyword hierarchy for Earth science data sets and a 3-level keyword hierarchy for data services.
 - ▶ 1,850 Science Keywords
 - ▶ 166 Service Keywords
- ▶ Controlled keywords offer a structure, ensure that metadata are keyed in a consistent manner, and allow for the precise searching of metadata records and subsequent retrieval of data and services.
- ▶ For more information, see <http://gcmd.nasa.gov/learn/keywords>

Keyword Structure



Organizations Using GCMD Keywords



docBUILDER

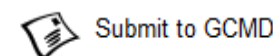
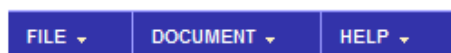


Online metadata authoring tool designed for authors to add (or modify) data set descriptions (DIFs) and/or related services descriptions (SERFs).

- Offers controlled vocabulary, making authoring easier and more accurate.
- Provides validation of controlled fields and syntax.
- Provides a “visual” check-list of required, highly recommended, and recommended fields to populate.
- Offers a secure system for your metadata management needs. A NASA URS account is required to access docBUILDER.

<http://gcmd.nasa.gov/collaborate/docbuilder>

docBUILDER Interface



- ☒ Entry ID ⓘ
- ☐ Entry Title ⓘ
- ☐ Science Keywords ⓘ
- ☐ ISO Topic Category ⓘ
- ☐ Data Center ⓘ
- ☐ Summary ⓘ
- ☐ Data Set Citation ⓘ
- ☐ Personnel ⓘ
- ☐ Related URL ⓘ
- ☐ Instrument ⓘ
- ☐ Platform ⓘ
- ☐ Temporal Coverage ⓘ

- ☐ Paleo-Temporal Coverage ⓘ
- ☐ Spatial Coverage ⓘ
- ☐ Location ⓘ
- ☐ Data Resolution ⓘ
- ☐ Project ⓘ
- ☐ Quality ⓘ
- ☐ Access Constraints ⓘ
- ☐ Use Constraints ⓘ
- ☐ Distribution Information ⓘ
- ☐ Data Set Language ⓘ
- ☐ Data Set Progress ⓘ
- ☐ Ancillary Keyword ⓘ

- ☐ Originating Center ⓘ
- ☐ Multimedia Sample ⓘ
- ☐ Publication/Reference ⓘ
- ☐ Parent DIF ⓘ
- ☐ IDN Node ⓘ
- ☒ DIF Creation Date ⓘ
- ☒ Last DIF Revision Date ⓘ
- ☐ DIF Revision History ⓘ
- ☐ Future DIF Review Date ⓘ
- ☐ Privacy Status ⓘ
- ☐ Extended Metadata ⓘ

Note: This document is automatically saved and can be retrieved up to 90 days using the Entry ID (Document Identifier) "[esip](#)". Please complete the document and submit it for publication within that period.

Legend: ☐ = Required ☐ = Highly Recommended ☐ = Recommended

Pathway 1: Website Search (Human Interfaces)

Search Interface - Homepage



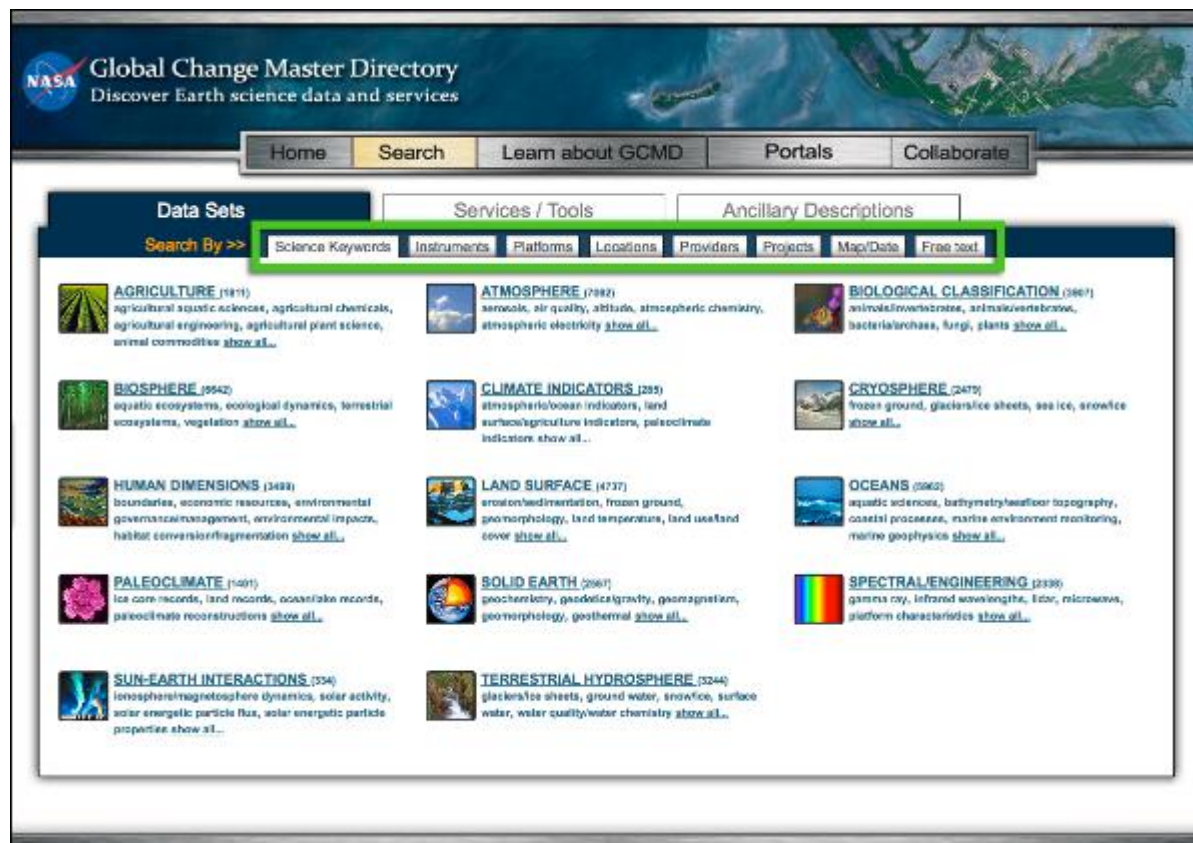
The homepage helps direct users by dividing the search directory into three categories:

- (1) Data Sets
- (2) Services/Tools
- (3) Ancillary Descriptions

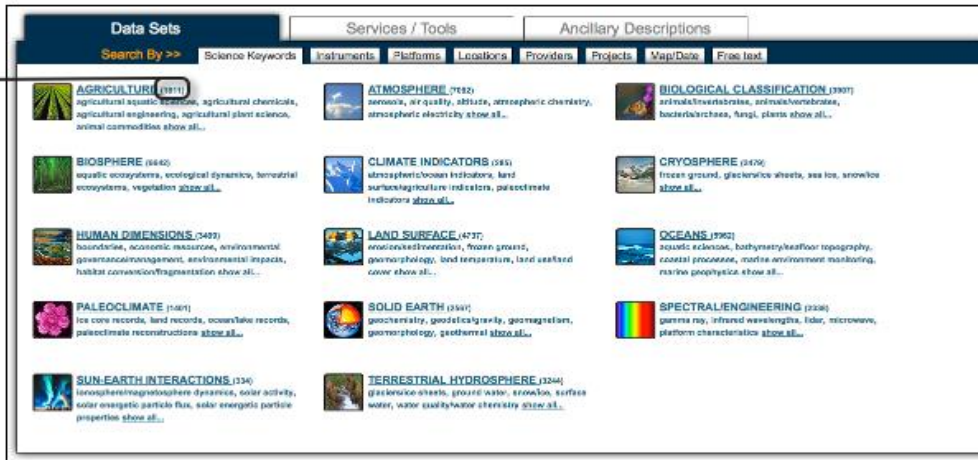
A free text search box is also available on the homepage.

Search Interface

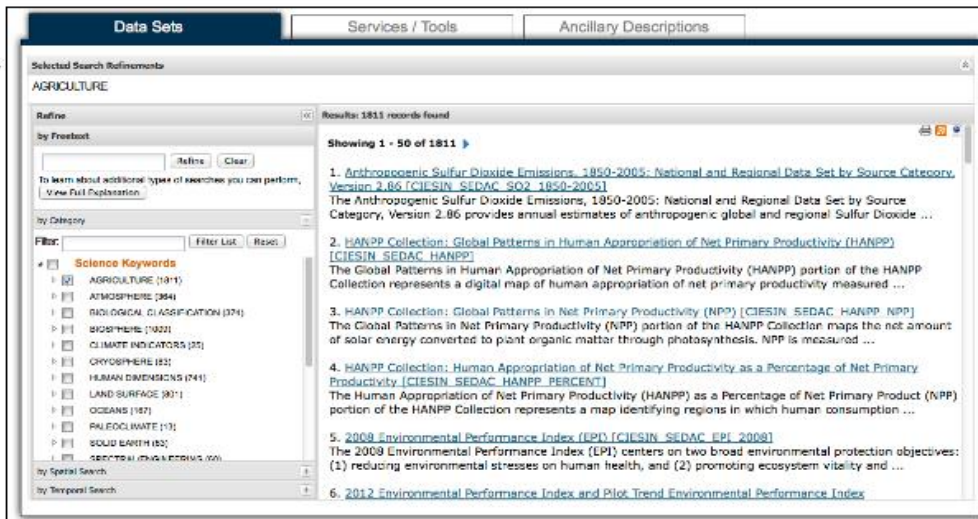
The “Search By” menu allows users to click the tab and immediately begin searching by a specific category (Science Keywords, Instruments, Platforms, Locations, Providers, Projects, Map/Date, and Free text).



Search Refinements - Keywords



Users have the option to either search within a category using the keywords provided or the numbers located on the side of a keyword in that category.

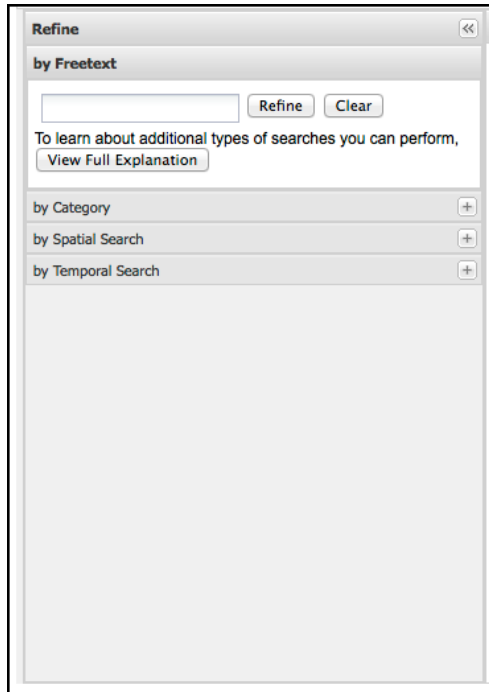


For the numbers option (or if the example keywords that appear in smaller font are selected), users will go directly to a list of metadata records that pertain to that specific keyword.

Users will then be able to utilize the expanded refinement page where they can continue to refine their search.

Search Refinements

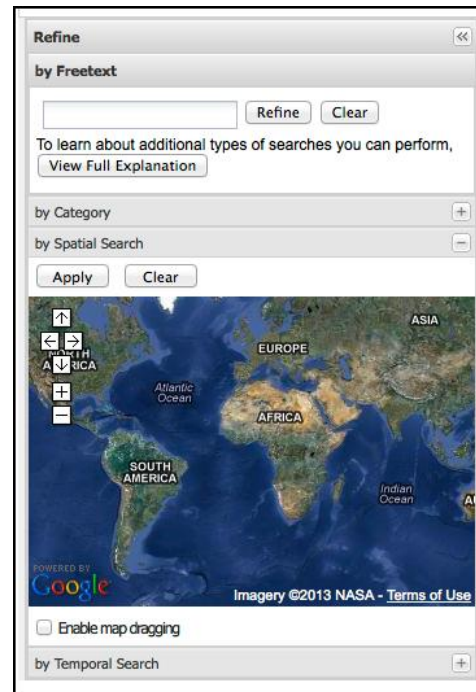
Free Text



The 'Free Text' refinement panel includes a search input field with 'Refine' and 'Clear' buttons. Below it is a link to 'View Full Explanation'. Three expandable sections are listed: 'by Category' (expanded), 'by Spatial Search', and 'by Temporal Search'. The 'by Category' section is currently empty.

Search within data sets and services/tools. The free text search offers Boolean and fielded search capabilities.

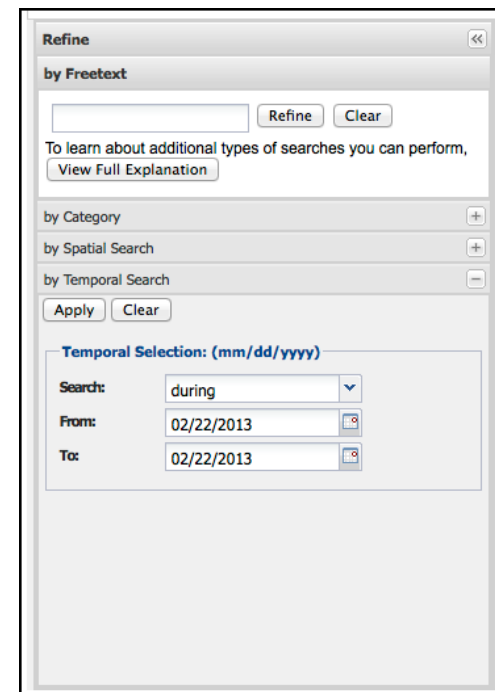
Spatial Search



The 'Spatial Search' refinement panel includes a search input field with 'Refine' and 'Clear' buttons, and a 'View Full Explanation' link. It features three expandable sections: 'by Category', 'by Spatial Search' (expanded), and 'by Temporal Search'. The 'by Spatial Search' section displays a world map with navigation controls (arrows, zoom in/out) and a bounding box. Text at the bottom of the map reads 'POWERED BY Google Imagery ©2013 NASA - Terms of Use'. There is also an 'Enable map dragging' checkbox.

Spatially refine their search using Google maps to draw a bounding box around their area of interest.

Temporal Search



The 'Temporal Search' refinement panel includes a search input field with 'Refine' and 'Clear' buttons, and a 'View Full Explanation' link. It features three expandable sections: 'by Category', 'by Spatial Search', and 'by Temporal Search' (expanded). The 'by Temporal Search' section contains a 'Temporal Selection: (mm/dd/yyyy)' section with a 'Search:' dropdown set to 'during', and 'From:' and 'To:' date pickers both set to '02/22/2013'.

Search a specific metadata record by a time range.

Search Ancillary Descriptions

Search ancillary descriptions (platforms, instruments, data centers, projects,) and access associated data set and service descriptions.

Platform Description

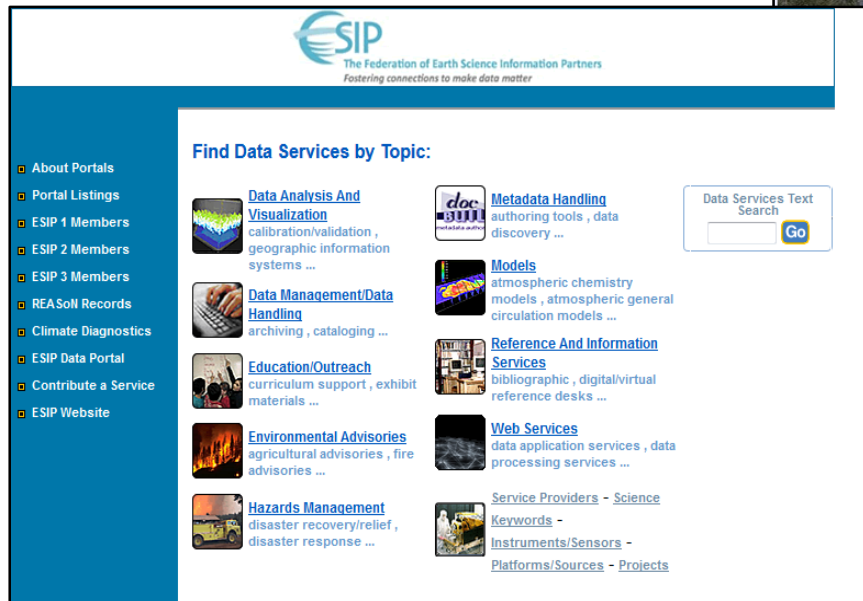
The screenshot shows the 'Platform Description' page. The top navigation bar has three tabs: 'Data Sets', 'Services / Tools', and 'Ancillary Descriptions'. The 'Ancillary Descriptions' tab is active. On the left, there is a sidebar with 'Ancillary Type' set to 'Platforms'. Below this, there is a 'Filter List' showing 'Earth Observation Satellites' and 'AQUA'. The main content area displays the results for 'Platform: AQUA > Earth Observing System, AQUA'. It includes a small image of the satellite and a link to 'Click to view more'. Below this, there is a section for 'Platform-based Instruments' with a link to 'Click to view more'. The 'Orbit' section lists various orbital parameters: Orbit Altitude: 705 km, Orbit Inclination: 98.2 degrees, Equator Crossing: 1:30 p.m. (south to north) and 1:30 a.m. (north to south), Period: 98.8 minutes, Repeat Cycle: 16 days (233 revolutions), Perigee: 699 km (434 mi), Apogee: 706 km (438 mi), and Orbit Type: LEO > Low Earth Orbit > Polar Sun-Synchronous. There is a link to 'View all 653 records related to this platform'. The 'Description' section states that Aqua is a major international Earth Science satellite mission centered at NASA, launched on May 4, 2002, and named for the large ... There is a link to 'Click to view more'. The 'Online Resource' section lists three URLs: http://aqua.nasa.gov/, http://www.nasa.gov/mission_pages/aqua/, and http://aqua.nasa.gov/about/instruments.php. The 'Platform Logistics' section lists 'Design Life: 6 years' and 'Launch Date: 2002-05-04'. The bottom sidebar shows 'Instruments', 'Data Centers', and 'Projects' with expand/collapse icons.

Project Description

The screenshot shows the 'Project Description' page. The top navigation bar has three tabs: 'Data Sets', 'Services / Tools', and 'Ancillary Descriptions'. The 'Ancillary Descriptions' tab is active. On the left, there is a sidebar with 'Ancillary Type' set to 'Projects'. Below this, there is a 'Filter List' showing 'D-F' and 'ESIP'. The main content area displays the results for 'Earth Science Information Partners Program'. It includes a link to 'Project Description'. The 'Description' section states that The Federation of Earth Science Information Partners (ESIP) is an open networked community that brings together science, data and information technology practitioners. On an individual level, participation in the ESIP Federation is beneficial because it provides an intellectual commons to expose, gather and enhance in-house capabilities in support of an organization's own mandate. In this forum, practitioners work together on interoperability efforts across Earth and environmental science allowing self-governed and directed groups to emerge around common issues, ebbing and flowing as the need for them arises. These efforts catalyze connections across organizations, people, systems and data allowing for improved interoperability in distributed systems. By virtue of working in the larger community, ESIP members experience the network effect, which enables more coordinated cyberinfrastructure across domain-specific communities. Using this open, community-based, discipline and agency neutral approach, the ESIP Federation has a 14-year track record of success and continued growth. There is a link to 'For more information, see: http://www.esipfed.org/'.

Search Using Portals

- ▶ Virtual subsets of data and services
- ▶ Customizable views

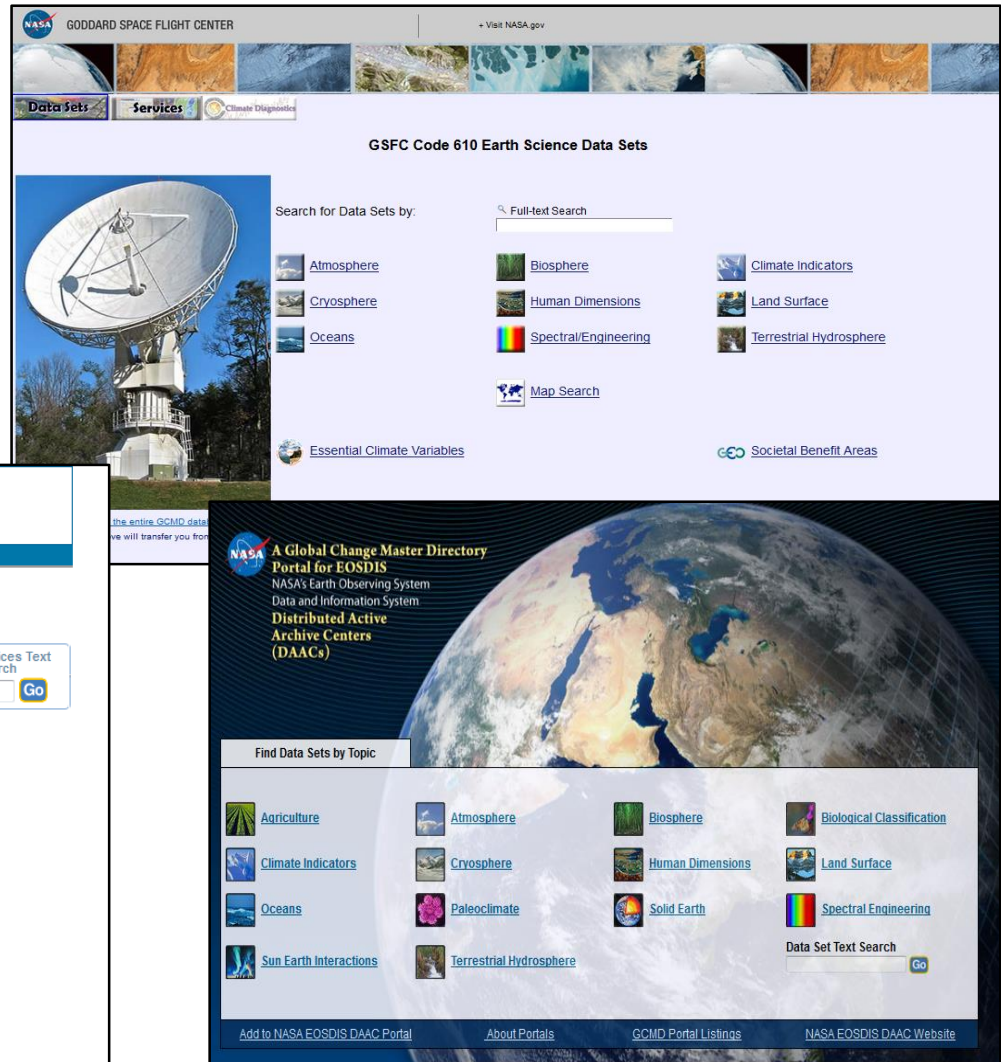


ESIP
The Federation of Earth Science Information Partners
Fostering connections to make data matter

Find Data Services by Topic:

- Data Analysis And Visualization**
calibration/validation, geographic information systems ...
- Metadata Handling**
authoring tools, data discovery ...
- Models**
atmospheric chemistry models, atmospheric general circulation models ...
- Data Management/Data Handling**
archiving, cataloging ...
- Reference And Information Services**
bibliographic, digital/virtual reference desks ...
- Web Services**
data application services, data processing services ...
- Education/Outreach**
curriculum support, exhibit materials ...
- Environmental Advisories**
agricultural advisories, fire advisories ...
- Hazards Management**
disaster recovery/relief, disaster response ...
- Service Providers - Science**
Keywords -
Instruments/Sensors -
Platforms/Sources - Projects

Data Services Text Search



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GSFC Code 610 Earth Science Data Sets

Search for Data Sets by: Full-Text Search

- [Atmosphere](#)
- [Cryosphere](#)
- [Oceans](#)
- [Biosphere](#)
- [Human Dimensions](#)
- [Spectral/Engineering](#)
- [Map Search](#)
- [Climate Indicators](#)
- [Land Surface](#)
- [Terrestrial Hydrosphere](#)
- [Essential Climate Variables](#)
- [Societal Benefit Areas](#)

A Global Change Master Directory Portal for EOSDIS
NASA's Earth Observing System Data and Information System
Distributed Active Archive Centers (DAACs)

Find Data Sets by Topic

- [Agriculture](#)
- [Atmosphere](#)
- [Biosphere](#)
- [Biological Classification](#)
- [Climate Indicators](#)
- [Cryosphere](#)
- [Human Dimensions](#)
- [Land Surface](#)
- [Oceans](#)
- [Paleoclimate](#)
- [Solid Earth](#)
- [Spectral Engineering](#)
- [Sun Earth Interactions](#)
- [Terrestrial Hydrosphere](#)

Data Set Text Search

[Add to NASA EOSDIS DAAC Portal](#) [About Portals](#) [GCMD Portal Listings](#) [NASA EOSDIS DAAC Website](#)

Staying Connected

- ▶ Email notifications (Send email to gsfc-gcmduso@mail.nasa.gov to sign up for the mailing lists)
 - **GCMD-DAAC:** GCMD-DAAC related news and release announcements (gcmd-daacs@lists.nasa.gov)
 - **docBUILDER:** News and downtime notifications on metadata authoring tool (ceos-idn-docbuilder@lists.nasa.gov)
 - **Interoperability Forum:** Release announcements and discussion of proposed changes to the DIF and SERF (ceos-idn-interop@lists.nasa.gov)
 - **GCMD Notifications:** Alerts of possible outages and service downtimes (gcmd-notifications@lists.nasa.gov)
 - **GCMD Technical:** Discussion of software and technology used by GCMD staff (gcmd-tech@lists.nasa.gov)

Contact Us

Lola. M. Olsen

Project Manager

Lola.M.Olsen@nasa.gov

Scott Ritz

Lead Science Coordinator

Scott.A.Ritz@nasa.gov

Tyler Stevens

Data Services Coordinator

Tyler.B.Stevens@nasa.gov

Thomas Cherry

Lead Software Developer

Thomas.A.Cherry@nasa.gov

Pathway 2: Web Service APIs (Machine Interfaces)