



EOSDIS

NASA'S EARTH OBSERVING SYSTEM
DATA AND INFORMATION SYSTEM

Earthdata Search: The Relevance of Relevance

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EED Program



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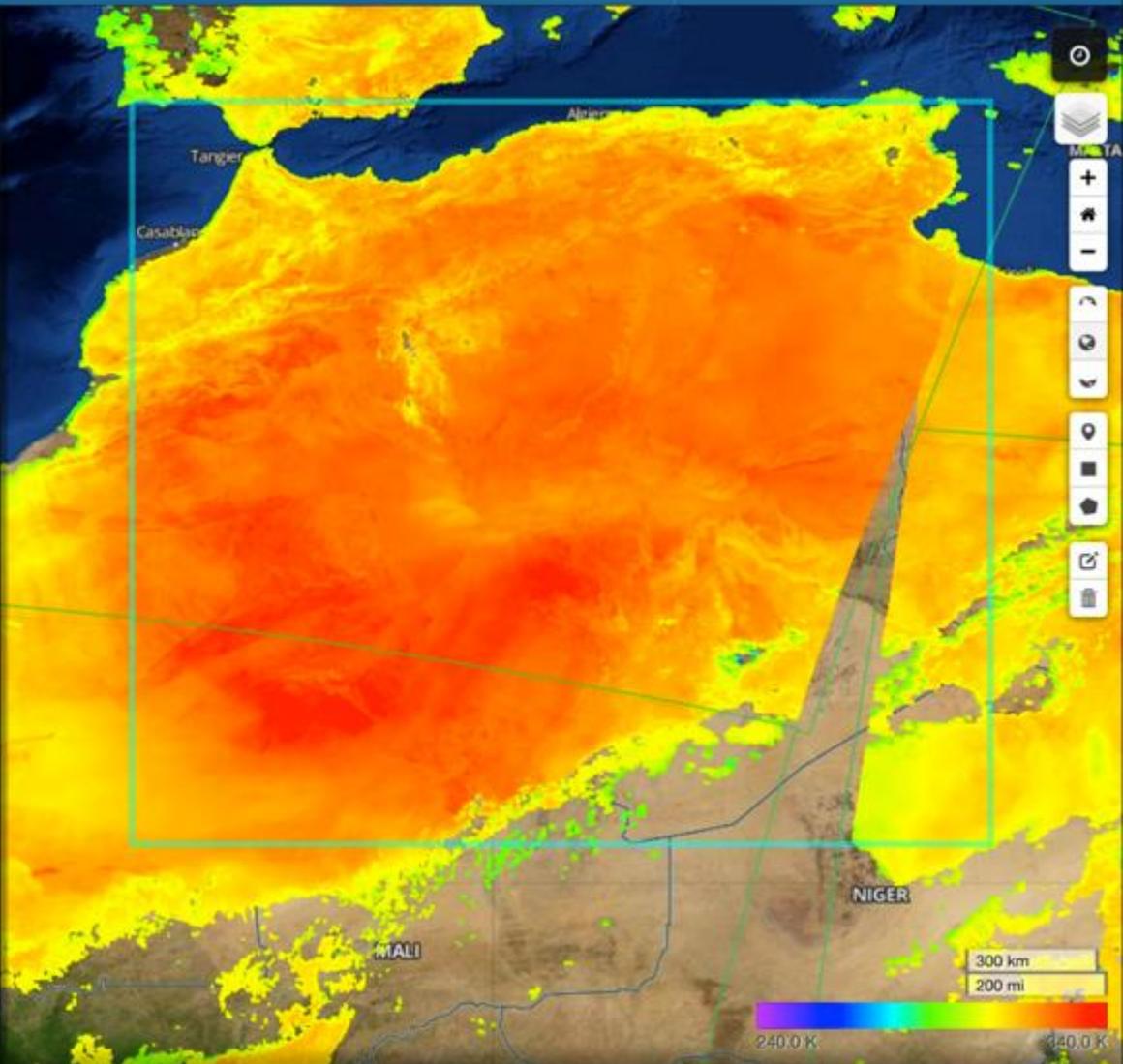
Back to Collections

MODIS/Terra Near Real Time (NRT) Land Surface Temperature/Emissivity 5-Min L2 Swath 1km

Retrieve Collection Data

Showing 4 of 4 matching granules for the selected day. (Show All)
Sort by: Search Time: 0.2s Report a metadata problem

- MOD11_L2.A2016162.1100.006.2016162120416.NRT.hdf**
2016-06-10T11:00:00Z to 2016-06-10T11:05:00Z
- MOD11_L2.A2016162.1055.006.2016162120412.NRT.hdf**
2016-06-10T10:55:00Z to 2016-06-10T11:00:00Z
- MOD11_L2.A2016162.0920.006.2016162103246.NRT.hdf**
2016-06-10T09:20:00Z to 2016-06-10T09:25:00Z
- MOD11_L2.A2016162.0915.006.2016162102959.NRT.hdf**
2016-06-10T09:15:00Z to 2016-06-10T09:20:00Z



Late 2015: Our catalog grew

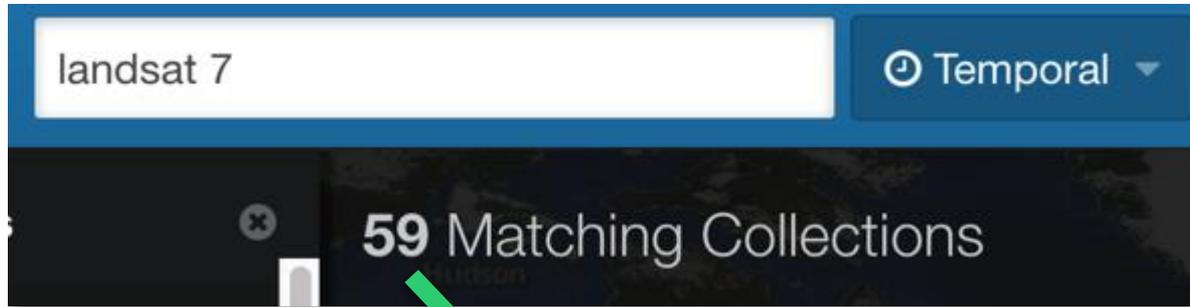
7053 Matching Collections

Add collections to your project to compare

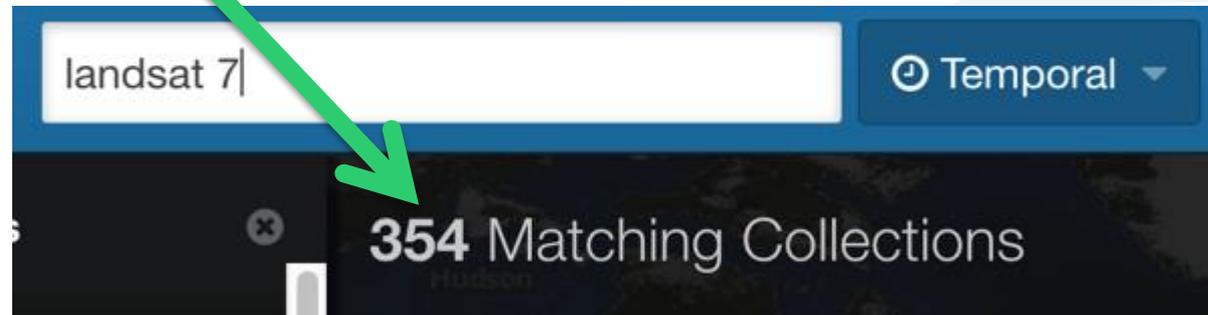
32960 Matching Collections

Add collections to your project to compare

... as did our relevancy needs

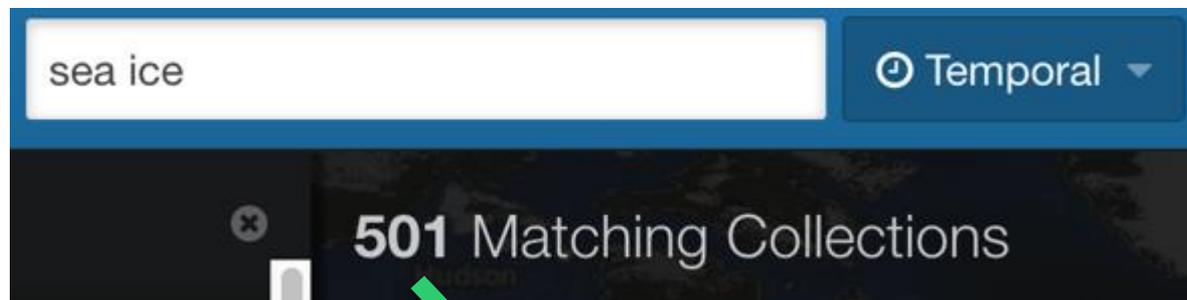


A screenshot of a search interface. The search bar contains the text "landsat 7". To the right of the search bar is a button labeled "Temporal" with a clock icon and a dropdown arrow. Below the search bar, a dark banner displays "59 Matching Collections" in white text. A green arrow points from this banner down to the second screenshot.



A screenshot of a search interface. The search bar contains the text "landsat 7|". To the right of the search bar is a button labeled "Temporal" with a clock icon and a dropdown arrow. Below the search bar, a dark banner displays "354 Matching Collections" in white text. A green arrow points from the first screenshot to this banner.

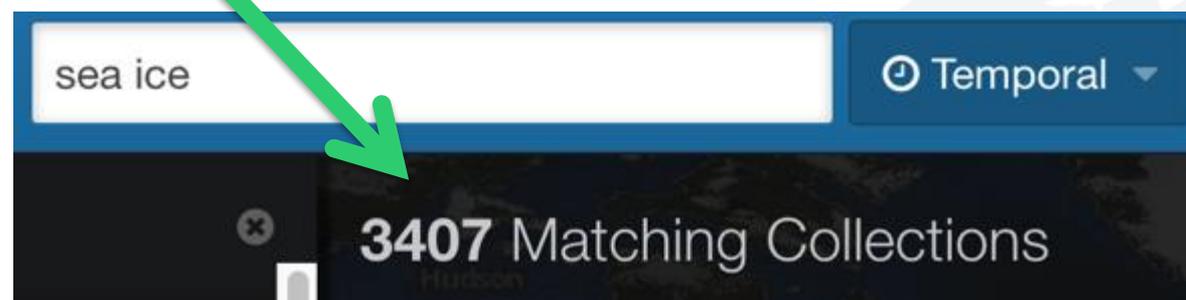
... as did our relevancy needs



sea ice Temporal

501 Matching Collections

This screenshot shows a search interface with a search bar containing the text 'sea ice' and a 'Temporal' filter button. Below the search bar, a dark banner displays '501 Matching Collections' with a close button (x) on the left.



sea ice Temporal

3407 Matching Collections

This screenshot shows the same search interface as above, but with the search results banner updated to '3407 Matching Collections'. A green arrow points from the '501' in the first screenshot to the '3407' in this one.

Users echoed the need for better relevance

Our Method

Initial Questionnaire



Survey

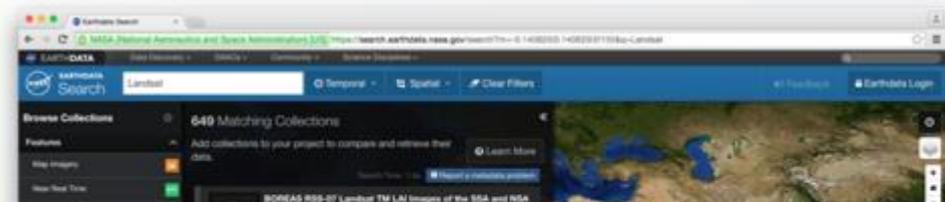
Before the complete familiarity

Finding

Collections

Search Relevance

Clear-cut, highly-specific searches do not turn up what users need as the top result. Less specific searches fare worse.



If users can't find the collections
they need,
none of our other work matters

Earthdata Search

METADATA AND DISCOVERABILITY

Metadata isn't always consistent (Nor should we require it to be)

Processing level	
1	204
1A	24
1B	219
1T	10
L1T	6
Level 1	7
NA	2

Platform	
AM-1	48
TERRA	1

SOLID EARTH	176
SPECTRAL ENGINEERING	2
SPECTRAL/ENGINEERING	548
SUN-EARTH INTERACTIONS	22

Sometimes it is
too consistent


No image
available

AfSIS MODIS Collection: Albed

CIESIN_AfSIS_MODIS_ALB2012 v2012.00 - C

2000-02-01 to 2012-06-30 | Collection on


No image
available

AfSIS MODIS Collection: Land

CIESIN_AfSIS_MODIS_LCT2012 v2012.00 - C

2001-01-01 to 2009-12-31 | Collection on


No image
available

AfSIS MODIS Collection: Leaf A

CIESIN_AfSIS_MODIS_LAIFPAR2012 v2012.0

2000-02-01 to 2012-06-30 | Collection on


No image
available

**AfSIS MODIS Collection: Land
Release**

CIESIN_AfSIS_MODIS_LST201404 v2014.04

2002-07-01 to 2014-03-31 | Collection on


No image
available

AfSIS MODIS Collection: Prima

CIESIN_AfSIS_MODIS_PP2012 v2014.00 - C

2000-01-01 to 2010-12-31 | Collection on


No image
available

AfSIS MODIS Collection: Veget

CIESIN_AfSIS_MODIS_VEGIN201404 v2014.0

2000-02-01 to 2014-03-31 | Collection on

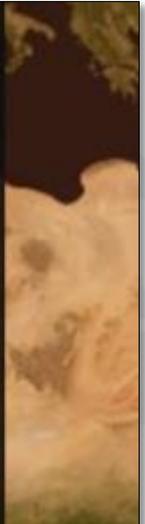
Sometimes it's incomplete or contains errors

BIOMASS	1
BIOOSPHERE	2
BIOSPHERE	839

MODIS/Terra Snow Cover 5-Min L2 500m V005 NRT

Information Metadata

Download Page:
Description:
Level 2 Snow Cover 5-Min L2 500m...
Archive Center:
LAADS
Processing Center:
MODAPS



Sometimes it is too complete



Spatial Coordinates:
Bounding Rectangle: (-50°, -180°, -70°, 180°)
Bounding Rectangle: (85°, -10°, 70°, 35°)
Temporal Extent:
2004-10-01 to 2007-03-31

Metadata Formats: [Native](#) | [ATOM](#) | [ECHO10](#) | [ISO19115](#) | [DIF](#) | [OSDD](#)

API Endpoints:

Metadata record for data from ASAC Project 2584
See the link below for public details on this project.

The Southern Ocean plays a significant role in the biogeochemical cycling of sulphur due to high spring-summer fluxes of dimethylsulphide (DMS), particularly south of 60 degrees S. Recent DMS flux perturbation simulations have recently highlighted the key role of the SO between 50-70 degrees S in the DMS-climate feedback hypothesis [Gabric et al., 2003; Gabric et al., 2004]. This project examines the interactions and feedback between marine polar plankton and global climate through the use of biogeochemical and global climate models, and explores the sensitivity of climate to the current and future biogenic production of dimethylsulphide at polar latitudes.

This was a modelling project, and as such did not collect any data of its own.

Taken from the abstracts of the referenced papers:

The global climate is intimately connected to changes in the polar oceans. The variability of sea ice coverage affects deep-water formations and large-scale thermohaline circulation patterns. The polar radiative budget is sensitive to sea-ice loss and consequent surface albedo changes. Aerosols and polar cloud microphysics are crucial players in the radioactive energy balance of the Arctic Ocean. The main biogenic source of sulfate aerosols to the atmosphere above remote seas is dimethylsulphide (DMS).

Recent research suggests the flux of DMS to the Arctic atmosphere may change markedly under global warming. This paper describes climate data and DMS production (based on the five years from 1998 to 2002) in the region of the Barents Sea (30-35 degrees E and 70-80 degrees N). A DMS model is introduced together with an updated calibration method. A genetic algorithm is used to calibrate the chlorophyll-a (Chl) measurements (based on satellite SeaWiFS data) and DMS content (determined from cruise data collected in the Arctic). Significant interannual variation of the Chl amount leads to significant interannual variability in the observed and modelled production of DMS in the study region. Strong DMS production in 1998 could have been caused by a large amount of ice algae being released in the southern region.

Forcings from a general circulation model (CSIRO Mk3) were applied to the calibrated DMS model to predict the zonal mean sea-to-air flux of DMS for contemporary and enhanced greenhouse conditions at 70-80 degrees N. It was found that significantly decreasing ice coverage, increasing sea surface temperature and decreasing mixed-layer depth could lead to annual DMS flux increases of more than 100% by the time of equivalent CO2 tripling (the year 2080). This significant perturbation in the aerosol climate could have a large impact on the regional Arctic heat budget and consequences for global warming.

The response of oceanic phytoplankton to climate forcing in the Arctic Ocean has attracted increasing attention due to its special geographical position and potential susceptibility to global warming. Here, we examine the relationship between satellite derived (sea-viewing wide field-of-view sensor, SeaWiFS) surface chlorophyll-a (Chl) distribution and climatic conditions in the Barents Sea (30-35 degrees E, 70-80 degrees N) for the period 1998-2002. We separately examined the regions north and south of the Polar Front (~76 degrees N). Although field data are rather limited, the satellite Chl distribution was generally consistent with cruise observations. The temporal and spatial distribution of Chl was strongly influenced by the light regime, mixed layer depth, wind speed and ice cover. Maximum Chl values were found in the marginal sea-ice zone (72-73 degrees N) and not in the ice-free region further south (70-71 degrees N). This indicates that melt-water is an important contributor to higher Chl production. The vernal phytoplankton bloom generally started in late March, reaching its peak in late April.

A second, smaller Chl peak occurred regularly in late summer (September). Of the 5 years, 2002 had the highest Chl production in the southern region, likely due to earlier ice melting and stronger solar irradiance in spring and summer.

Arctic ecosystems and global climate are closely related. This paper studies the distributions and the coupling relationship between Chlorophyll a (Chl) and aerosol optical thickness (AOT) in Greenland Sea (10 degrees W - 10 degrees E, 70 degrees N - 85 degrees N) during

Facet relevancy matters, too

GROUND STATIONS	1120
GROUND-BASED OBSERVATIONS	1269
LABORATORY	708
LANDSAT	277
LANDSAT-5	206
LANDSAT-7	184
MAPS	352
METEOROLOGICAL STATION	106

Providing relevant refinement options and meaningful distinctions between results is as important as result order

Earthdata Search

HOW DO WE IMPROVE RELEVANCY?

Immediate easy wins

Sort order: Newer versions first

Version 6 Near-Realtime

Version 6

Version 5.1

Version 5 Near-Realtime

The screenshot displays a list of four data products in a dark-themed interface. Each entry includes a thumbnail, a title, a source identifier, a date/status, and the number of granules. Information and add buttons are visible on the right of each entry.

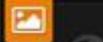
Thumbnail	Title	Source	Date/Status	Granules
No image available (NRT)	MODIS/Terra Near Real Time (NRT) Total Precipitable Water Vapor 5-Min L2 Swath 1km and 5km	MOD05_L2 v6NRT - NASA/GSFC/EOS/ESDIS/LANCEMODIS	2015-12-06 ongoing	2873
Global map (v6)	MODIS/Terra Total Precipitable Water Vapor 5-Min L2 Swath 1km and 5km V006	MOD05_L2 v6 - NASA/GSFC/SED/ESD/HBSL/BISB/LAADS	1999-12-18 ongoing	1682654
Global map (v5.1)	MODIS/Terra Total Precipitable Water Vapor 5-Min L2 Swath 1km and 5km V5.1	MOD05_L2 v5.1 - NASA/GSFC/SED/ESD/HBSL/BISB/LAADS	1999-12-18 ongoing	1680564
No image available (NRT)	MODIS/Terra Near Real Time (NRT) Total Precipitable Water Vapor 5-Min L2 Swath 1km and 5km (Collection 005)	MOD05_L2 v5NRT - NASA/GSFC/EOS/ESDIS/LANCEMODIS	1999-12-18 ongoing	2873

Sort order: Collections with granules first

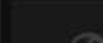
2,862 Granules

 **MODIS/Aqua Near Real Time (NRT) Total Precipitable Water Vapor 5-Min L2 Swath 1km and 5km (Collection 005)**
No image available
MYD05_L2 v5NRT - NASA/GSFC/EOS/ESDIS/LANCEMODIS
2002-05-04 ongoing | 2862 Granules

1,459,806 Granules

 **MODIS/Aqua Total Precipitable Water Vapor 5-Min L2 Swath 1km and 5km V5.1**
No image available
MYD05_L2 v5.1 - NASA/GSFC/SED/ESD/HBSL/BISB/LAADS
2002-05-04 ongoing | 1459806 Granules

Collection only

 **MODIS/Terra Granule Level 2 Water Vapor Infrared Jpeg image**
No image available
MOBWIR v6 - NASA/GSFC/SED/ESD/HBSL/BISB/LAADS
2000-02-25 ongoing | Collection only

Collection only

 **MODIS/Terra Granule Level 2 Water Vapor Near Infrared Jpeg image**
No image available
MOBWSW v6 - NASA/GSFC/SED/ESD/HBSL/BISB/LAADS
2000-02-25 ongoing | Collection only

Remove Less Useful Choices

2D Coordinate System ^	
CALIPSO	54
MISR	40
MODIS T	8
MODIS SIN	95
WELD Alaska	5
WELD CONUS Tile	6
WRS-1	2
WRS-2	9



Gather Metrics for Improvement

```
{"event": "search",  
  "data":{"page_size":"20","free_text":"sea ice","page_num":"1"}}
```

```
{"event": "filter",  
  "data":{"echo_collection_id":"C1000001538-PROV","page_size":"20","page_num":"1"}}
```

```
{"event": "search",  
  "data":{"page_size":"20","free_text":"modis sea ice","page_num":"1"}}
```

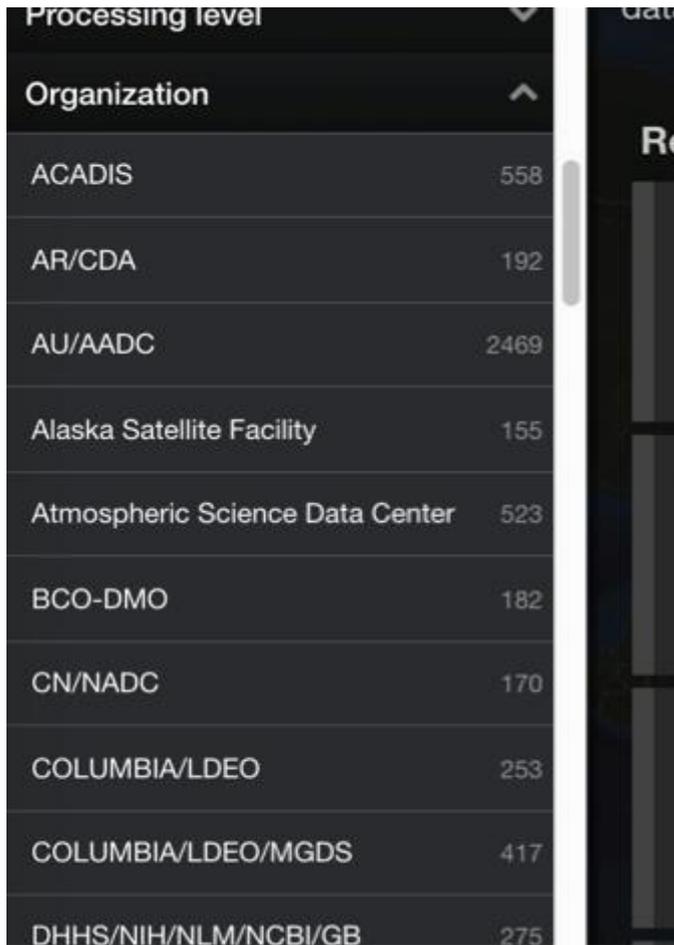
```
{"event": "search",  
  "data":{"page_size":"20","free_text":"mod29","page_num":"1"}}
```

```
{"event": "filter",  
  "data":{"echo_collection_id":"C1000001160-NSIDC_ECS",  
  "page_size":"20","page_num":"1"}}
```

```
{"event": "access",  
  "data":{"collections":["C1000001160-NSIDC_ECS"]}}
```

Broader Discoverability Improvements

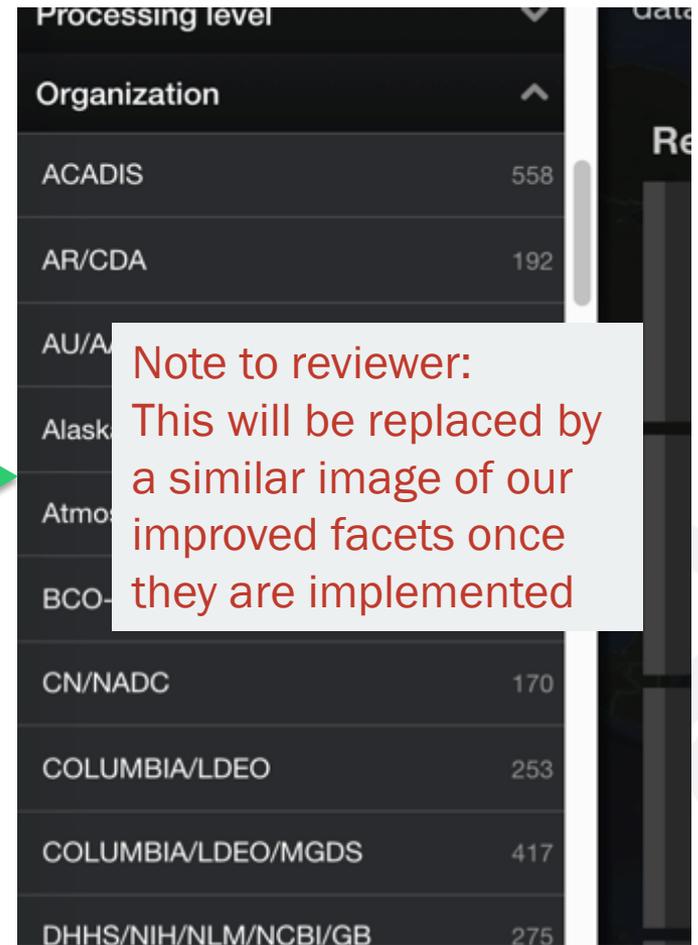
“Humanized” Facets



Processing level

Organization

ACADIS	558
AR/CDA	192
AU/AADC	2469
Alaska Satellite Facility	155
Atmospheric Science Data Center	523
BCO-DMO	182
CN/NADC	170
COLUMBIA/LDEO	253
COLUMBIA/LDEO/MGDS	417
DHHS/NIH/NLM/NCBI/GB	275



Processing level

Organization

ACADIS	558
AR/CDA	192
AU/AADC	2469
Alaska Satellite Facility	155
Atmospheric Science Data Center	523
BCO-DMO	182
CN/NADC	170
COLUMBIA/LDEO	253
COLUMBIA/LDEO/MGDS	417
DHHS/NIH/NLM/NCBI/GB	275

Note to reviewer:
This will be replaced by
a similar image of our
improved facets once
they are implemented

Surface more distinguishing information in collection results

The screenshot displays a user interface for satellite data collection. On the left, a sidebar shows a list of collections. The top collection is 'GHRSSST Level 2P Central Pacific Regional Skin Sea Surface Temperature from the Geostationary Operational Environmental Satellites (GOES) Imager on the GOES-15 satellite (GDS versions 1 and 2)'. It has 1,380 granules and was last updated on 2015-12-6. Below this is another entry for the same collection, labeled 'Collection Only'. The bottom entry is 'GHRSSST Level 2P Global Skin Sea Surface Temperature from the Moderate Resolution Imaging Spectroradiometer (MODIS)', which has 24 granules. On the right, a large satellite image shows the Pacific Ocean region, with the landmasses of North and South America visible on the right side.

GHRSSST Level 2P Central Pacific Regional Skin Sea Surface Temperature from the Geostationary Operational Environmental Satellites (GOES) Imager on the GOES-15 satellite (GDS versions 1 and 2)

★ NRT

1,380 **2015-12-6** Ocean Temperature
Granules Last Update Water Quality/Chemistry

GHRSSST Level 2P Central Pacific Regional Skin Sea Surface Temperature from the Geostationary Operational Environmental Satellites (GOES) Imager on the GOES-15 satellite (GDS versions 1 and 2)

Collection Only

24 **GHRSSST Level 2P Global Skin Sea Surface Temperature from the Moderate Resolution Imaging Spectroradiometer (MODIS)**

Use Learned Relevancy

```
{"event": "search",  
  "data":{"page_size":"20","free_text":"sea ice","page_num":"1"}}
```

```
{"event": "filter",  
  "data":{"echo_collection_id":"C1000001538-PROV","page_size":"20","page_num":"1"}}
```

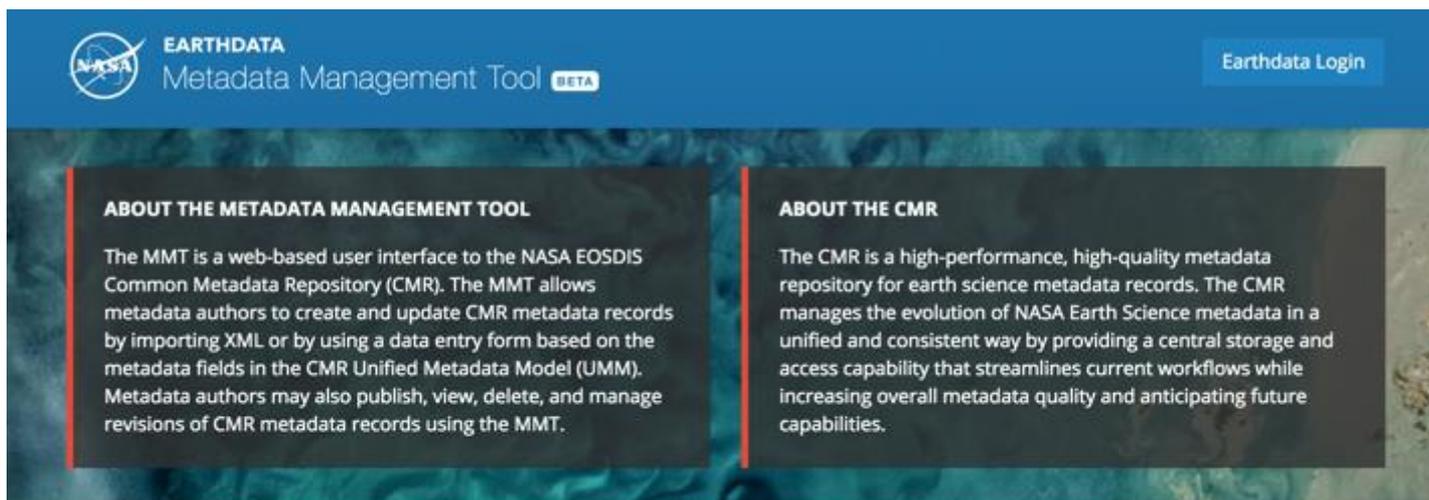
```
{"event": "search",  
  "data":{"page_size":"20","free_text":"modis sea ice","page_num":"1"}}
```

```
{"event": "search",  
  "data":{"page_size":"20","free_text":"mod29","page_num":"1"}}
```

```
{"event": "filter",  
  "data":{"echo_collection_id":"C1000001160-NSIDC_ECS",  
  "page_size":"20","page_num":"1"}}
```

```
{"event": "access",  
  "data":{"collections":["C1000001160-NSIDC_ECS"]}}
```

Keep Improving Metadata



ABOUT THE METADATA MANAGEMENT TOOL

The MMT is a web-based user interface to the NASA EOSDIS Common Metadata Repository (CMR). The MMT allows metadata authors to create and update CMR metadata records by importing XML or by using a data entry form based on the metadata fields in the CMR Unified Metadata Model (UMM). Metadata authors may also publish, view, delete, and manage revisions of CMR metadata records using the MMT.

ABOUT THE CMR

The CMR is a high-performance, high-quality metadata repository for earth science metadata records. The CMR manages the evolution of NASA Earth Science metadata in a unified and consistent way by providing a central storage and access capability that streamlines current workflows while increasing overall metadata quality and anticipating future capabilities.

Data Providers

Provider Name	Collections	Granules
ASF	158	7,343,560
AU_AADC	2,471	0
CDDIS	36	39,122,738
ECHO10_OPS	0	0
EDF DEV04	0	0

Did it help?

An ESIP 2017 Talk

QUESTIONS?

Thank You!

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This material is based upon work supported by the National Aeronautics and Space Administration under Contract Number **NNG15HZ39C**.

Raytheon