GES DAAC Data Support for AIRS/AMSU/HSB Instrument Data Sets

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GES DAAC Mission

The GES DAACs mission is to maximize the investment benefit of the Earth Science Enterprise by providing data and services that enable people to fully realize the scientific, educational, and application potential of global climate data.

In Short...

The GES DAACs mission is to:

ENABLE EARTH SCIENCE
GES DAAC Data Flow

Data from science processing facility or science teams

Science Algorithms

Version 0 (V0)
- Developed and implemented in-house
- Services most GES DAAC data originating prior to 1998

Version 1 (V1)
- Developed and implemented in-house
- Services TRMM data archive and distribution (Starting November, 1997)

Version 2 (V2) - EOSDIS (ECS)
- Developed and implemented by ESDIS
- Services Terra MODIS data archive and distribution, lower level data production
- Will service Aqua and Aura data sets

Data and Information to science, application, and education users
GES DAAC Science Disciplines

Global Biosphere

Ocean Color
- CZCS
- SeaWiFS
- MODIS

Land Biosphere
- AVHRR Pathfinder
- Triana

Monthly ocean chlorophyll and NDVI from SeaWiFS

Gulf Stream as seen by CZCS sensor

Green - future mission
Red - current mission
Black - closed data set
GES DAAC Science Disciplines

Hydrology

Rainfall Climatologies
Combined Satellite/Gauge Rainfall
TRMM
TRMM Field Experiments

Green - future mission
Red - current mission
Black - closed data set

GPCP Annual Mean Precipitation 1988 -1998

Hurricane Mitch as seen by TRMM

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GES DAAC Science Disciplines

Atmospheric Dynamics

TOVS Pathfinder
Data Assimilation
MODIS
AIRS/AMSU/HSB

Air Parcel Trajectories computed using Data Assimilation

TOVS 1000 MB Monthly Mean Specific Humidity

Green - future mission
Red   - current mission
Black - closed data set

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GES DAAC Science Disciplines

Atmospheric Chemistry

Heritage TOMS
Heritage SBUV
EP-TOMS
QuikTOMS
Triana
UARS
AURA-HIRDLS
AURA-MLS
AURA-OMI

Relationship between stratospheric Chlorine Monoxide and Ozone

Antarctic Ozone Hole 9/25/99 as seen by TOMS

Green - future mission
Red - current mission
Black - closed data set

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DAAC Data Support Services

Basic services include:

• User support via dedicated Atmospheric Dynamics Data Support Team
  – Data Team Lead Jianchun Qin: jcq@daac.gsfc.nasa.gov
  – Data Team email address: atmdyn-dst@daac.gsfc.nasa.gov

• Work with User Services group to answer user queries pertaining to access and use of data, set up user subscriptions, provide outreach services: daac_usg@gsfcsvr4.gsfcmo.ecs.nasa.gov

• Monitor ingest of AIRS/AMSU/HSB science data products to ensure integrity of metadata and proper database population of attributes

• Work with DAAC Operations group to diagnose and resolve data ingest and data distribution problems reported by users

• Provide full suite of documentation (detailed guide, summary guide, readme)
DAAC Data Support Services

Basic services include (cont):

• Work with scientists/ESDIS/ECS on Earth Science Data Type (ESDT) definition to facilitate access of data by the larger user community

• Support EDG User Interface (export valids for new/updated ESDTs)

• Develop local DAAC data search-and-order capabilities (includes temporal, spatial, and parameter searching, filtering by attribute, etc)

• Provide comprehensive Web information site including overview, images, documentation, data product descriptions, data access entry points, data manipulation tools, related links and references, and science topics (see, for example, http://daac.gsfc.nasa.gov/CAMPAIGN_DOCS/OCDST/science_focus.html)
DAAC Data Support Services

Advanced services include:

• Special product development (pre-cut subsets, GIS applications products)

• Special subsetting services including on-the-fly and on-demand subsetting by channel and by geographic region

• Provide NOAA/NCEP/NESDIS analysis and forecast products and satellite/in situ data via DAAC ancillary data server; provide tools for decoding data formats

• Provide online analysis and visualization tools for use with rolling archive of data products stored on anonymous FTP

• Support for field experiments
  – provide ancillary data on a 24x7 basis for mission planning
  – provide archive and distribution support for final campaign products
Data Reduction Techniques

- data selection (e.g., content-based search, filtering, browse)
- data subsetting (e.g., by time, by space, by parameter)
- data mining (algorithm integration, online analysis - GrADS, IDL)
- data compression (lossy and lossless)
MODIS Subsetting Example

1. MODIS on ECS
2. Subscription
3. Non-ECS platform
4. Channel Subsetting
5. Spatial Subsetting
6. Mapping software
7. GIS Conversion

- Back-up
- Subsetted and Geo-referenced Datasets
- RSIP Users

Status:
- Almost Done
- In Progress

Date: 3/26/2001
Field Experiment Support Example

### TRMM Field Experiment Ancillary Data Sets

**Satellite** | **Product** | **Campaigns**
--- | --- | ---
TRMM | Gridded Subsets | ☑️ ☑️ ☑️ ☑️
      | CSII | ☑️
GOES 8 & 10 | Full Set | ☑️
      | Regional Subset | ☑️
GMS-5 | 5km | ☑️ ☑️ ☑️
Meteosat-7 | 5km 3-hourly full disk | ☑️
SMMI | GPROF | ☑️ ☑️
      | TR | ☑️
TOVS | Gridded daily | ☑️
AVHRR | 3 km GAC NDMV+radiance | ☑️
      | OLR | ☑️
      | SST | ☑️ ☑️
Model
NCEP | 4 x daily | ☑️ ☑️ ☑️ ☑️

#### Miscellaneous Products

- **NDBC Buoy**: Hourly, Meteorological data
- **GPCP Combined**: Monthly, Gridded 2.5x2.5 deg
- **GPCC Gauge**: Monthly, gridded, 1 x 1 deg
- **CAMS Gauge**: Monthly, gridded, 5 x 5 deg
EOSDIS Ancillary Data Support

“larry” data volume = 1 GB/day
“eosdata” volume = 1.5 GB/day
“curly” : 14 day capacity
“larry” : 21 day capacity
“eosdata” backup to “larry”
On-line Analysis Tools: OASIS

- TOVS Path A NOAA-9 Monthly Surface Skin Temperature for 01/1985
  With Javascript enabled browser, clicking the image below starts animation.

- DAO Assimilation TG for 01/1985 at Surface Level
  With Javascript enabled browser, clicking the image below starts animation.

Left) Snap-shuts Below) Time-serieses

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On-line Analysis Tools: OASIS

--- Upper Air Reports From the PREPQC File
AIRS Data Support Web Site at GES DAAC

Overview
Documentation
Data Products
Data Access
Related Links
Browse Images
Data Maintenance
AIRS Data Access
AIRS Data Visualization

--- AIRS browse data fields: Level2 Surface Air Temperature in Kelvins

View AIRS Field: TSurfAir

TSurfAir is a 3D variable.
GeoXTrack = 30 GeoYTrack = 45
BUFR Data Support
--- Examples of Data Location Graph

PREPQC FNL Surface Report Data Coverage 02/06/01 at 00Z

PREPQC FNL Aircraft Report Data Coverage 02/06/01 at 00Z

PREPQC FNL Upper Air Report Data Coverage 02/06/01 at 00Z

PREPQC FNL Ship Report Data Coverage 02/06/01 at 00Z

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AIRS Data Subsetter

--- Extract metadata and fields from an AIRS file

Synopsis:
Usage: airsmeta -i input_file -o outfile -v option

Option:
- **-i** HDF swath input file name (mandatory)
- **-o** output file name, default is the standard output device
- **-v** view field, global and swath attributes, dimension information
  your options:
  field, global, swath, dim, or all
  (default option is all)

EXAMPLES: airsmeta -i test.hdf -o test.out -v all
On-the-fly Subsetting
Data Parameter Search

FTP
CD
Tape
Data Parameter Search
DAAC Data Access Methods

There are 3 ways to obtain data from the DAAC:

• **WWW User Interface**
  – Global EOS Data Gateway (EDG), URL http://eos.nasa.gov/imswelcome/
  – Local DAAC User Interface, URL http://eosdata.gsfc.nasa.gov

• **Anonymous FTP at**
  http://eosdata.gsfc.nasa.gov/CAMPAIGN_DOCS/FTP_SITE/ftp_site.html

• **Subscriptions**
  – Specified once and for all by user
  – User receives email for either push or pull operation
Data Selection Example (EDG)
Data Selection Example (Local UI)

MODIS Level 1B Calibrated Radiances 1km Data for 2000

Order Options:
1. Click on a highlighted day.
2. Use the Temporal Order section at the bottom of this page.

NOTE: Numbers shown in red are data granule counts.

JANUARY
78 Data Granules

FEBRUARY
2346 Data Granules

MARCH
1672 Data Granules

APRIL

MAY

JUNE

Select Spatial Range

The map below uses a Java applet that may take several seconds to load. This map allows Java-enabled browsers to create a spatial search box. Using your mouse, click on the map and drag the mouse to create the boundaries of the box. Alternatively, the latitude and longitude boundaries for a region can be provided in decimal form (not degree, minutes, seconds). Use + for North and East and - for South and West. Coordinates must be entered if the WWW browser is not Java-enabled.

West Longitude 70.0  South Latitude 14.0
East Longitude 120.0  North Latitude 47.0
HDF Data Access Tools

**EOSView** is a tool for examining, viewing, and verifying HDF and HDF-ESO data files. This tool enables the user to view the contents of HDF files and individual objects by being able to read and display all metadata fields and data objects. Supported read-out types for viewing and display capability include images, Raster images, multi-dimensional arrays, text, tables, (Virtual) and Vgroups. Attributes and annotations can also be viewed. EOSView was developed for various platforms for the Earth Observing System Data and Information System (EOSDIS) Core System (ECS).

**MSPHINX** (MODIS Satellite Process Handling Image Object Display) is a freeware package for image analysis, data plotting, format conversion, and many other sophisticated tasks. It was designed by Laboratoire d'Optique Atmosphérique, a French planetary research institution. MSPHINX is a UNIX, menu-driven package that is easy to install and use.

If you encounter any problems with MSPHINX, please report them to the University of Liege (mimara@geo.uni-liege.be).

**WebWind** is also a freeware tool. It is an interactive, interactive, interactive, interactive... tool. It can overlay the first three user-selected channels or other data layers, geocode each one of them, and produce a mapped true color image. Documentation on WebWind is available. Examples on how to extract different data models from MODIS are also given.

**geoview** is an interactive IDL program to read Level 1B and Level 2 MODIS products, but SDS and other attributes, and show granule location on a world map.

**Scientific**

Software is currently being evaluated and tested.
BACKUPS
Data Selection Example (Local UI)
Data Selection Example (Local UI)
Data Selection Example (Local UI)

AIRS HSB L1A Science Footprints Data for 2001

The total number of available granules for a month is listed under the month name on the calendar. Days with available granule data are colored. The underlined day is a link to a map illustrating the location of the granules.

[Calendar and map images]

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### Data Selection Example (Local UI)

#### L1A AIRS Products

<table>
<thead>
<tr>
<th>Data Products</th>
<th>Description</th>
<th>Begin Date</th>
<th>End Date</th>
<th>Number of Items</th>
<th>Average Item Size (KB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1A-HSB</td>
<td>L1A HSE data</td>
<td>2001-01-13</td>
<td>2001-09-15</td>
<td>14</td>
<td>46313</td>
</tr>
<tr>
<td>AMSU-LIA</td>
<td>L1A AMSU-A data</td>
<td>2001-09-13</td>
<td>2001-09-14</td>
<td>5</td>
<td>46313</td>
</tr>
<tr>
<td>L1A-AIRS</td>
<td>L1A HSE data</td>
<td>2001-09-13</td>
<td>2001-09-14</td>
<td>5</td>
<td>46313</td>
</tr>
<tr>
<td>L1A-VIS</td>
<td>L1A HSE data</td>
<td>2001-09-13</td>
<td>2001-09-14</td>
<td>5</td>
<td>46313</td>
</tr>
</tbody>
</table>

#### HSB L1A Science Footprints

Each link in the Year column below takes you to a calendar where you will be able to make your temporal selection.

<table>
<thead>
<tr>
<th>Year</th>
<th>Begin Date</th>
<th>End Date</th>
<th>Number of Items</th>
<th>Average Item Size (KB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>2001-01-13</td>
<td>2001-09-15</td>
<td>14</td>
<td>46313</td>
</tr>
</tbody>
</table>

Goddard DAAC Help Desk: 301-614-5224 or 1-800-237-6151 — daac@gsfc.nasa.gov
Web Curator: Peggy Baton — pbaton@daac.gsfc.nasa.gov
Author: Atmospheric Dynamics Data Support Team — atmdyn-data@daac.gsfc.nasa.gov
NASA Official: Steve Kempler, DAAC Manager — kempler@daac.gsfc.nasa.gov
Last updated: 2001-02-16 14:47:12

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