Western U.S. TEMPO Early Adopters

NASA Langley Atmospheric Science Data Center (ASDC)
Distributed Active Archive Center (DAAC) Services

April 10-11, 2018
NASA Langley’s ASDC is part of NASA’s EOSDIS
NASA Langley ASDC at a Glance

- Provides data services for over 44 science projects
- Primary: CALIPSO, CATS, CERES, DSCOVR, MISR, MOPITT, SAGEIII-ISS, TES
- Distributes 400+ unique science products
- In 2017, 1,100 Terabytes of data were distributed to over 160,000 customers in 158 countries with 5.2 Petabytes of data are in the archive as of December 2017
- Over 107 million files (3,100 TB) on high-speed disk for quick access

Radiation Budget

Clouds

Aerosols

Tropospheric Composition

Primary Functions

Receive (Ingest) data from numerous data providers to archive and support science driven requirements

Archive data to ensure the long term preservation, provenance, and proper use of the science data

Process data in up to date managed environments to create higher level data products for science community

Distribute data to as many scientific communities as possible in as many formats and through as many mechanisms as possible

Provide customer support and outreach to the science community to support science teams and facilitate use of data products and associated technologies by current and emerging users
Services at the ASDC – pre-launch

• Preparation for Ingest
  • Accurate metadata for discovery
  • Well formatted data for maximum interoperability
  • Digital Object Identifiers for each product

• Support Data Flow Testing Prior to Launch
  • Interface confidence tests
  • End-to-end ground system testing with instrument or synthetic data

• Discuss Service Options
  • Customer/Product affinities and technical capacity
  • Data Delivery Cadence
Services at the ASDC

• Standard curation of archived data
  • Provenance and integrity
  • Up to date documentation
  • Disaster Recovery

• User Services staff to assist customers
  • Maintain FAQs, examples of scripts
  • Perform reach back to science team when necessary
  • Disseminate announcements to user community
  • Use customer feedback from annual third-party ACSI survey, contacts, and ASDC User Working Group to determine changes in services

• Subsetting and ArcGIS capabilities
  • Temporal, spatial and variable slices
Linkage to EOSDIS Services

- Earthdata Search
- Land, Atmosphere Near real-time Capability for EOS (LANCE)
- Global Imagery Browse Services (GIBS) and Worldview
- Giovanni
Mt Agung (Bali) eruption plumes seen by MISR November 29, 2017. Volcanic eruptions can generate a significant amount of atmospheric aerosols that have regional to global impacts. Accurate plume heights are needed to determine the influence of volcanic eruptions, but are difficult to obtain due to the hazardous nature of eruptions. Stereo images from NASA’s Multi-angle Imaging SpectroRadiometer (MISR) make it possible to retrieve plume heights during eruptions.
Earth Data Search
https://earthdata.nasa.gov
Land, Atmosphere Near real-time Capability for EOS (LANCE)
https://earthdata.nasa.gov/earth-observation-data/near-real-time

LANCE: NASA NEAR REAL-TIME DATA AND IMAGERY

Land, Atmosphere Near real-time Capability for EOS (LANCE) supports users interested in monitoring a wide variety of natural and man-made phenomena. Near Real-Time (NRT) data and imagery from the AIRS, AMSR2, LIS (ISS), MISR, MLS, MODIS, MOPITT, OMI, OMPS, and VIIRS instruments are available much quicker than routine processing allows. Most data products are available within 3 hours from satellite observation. NRT imagery are generally available 3-5 hours after.
Global Imagery Browse Services (GIBS)

Visually explore the past and present of our dynamic planet through the Global Imagery Browse Services (GIBS). GIJS provides quick access to over 600 satellite imagery products, covering every part of the world. Most imagery is available within a few hours after satellite overpass, some products span almost 30 years, and the imagery can be rendered in your own web client or GIS application.

NASA EOSDIS Global, Full Resolution Imagery

NASA EOSDIS GIJS provides full resolution visual representations of NASA Earth science data in a free, open, and interoperable manner. Through responsive and highly available web services, it enables interactive exploration of data to support a wide range of applications including scientific research, applied sciences, natural hazard monitoring, and outreach.

Quick and Easy Access to Imagery

Quickly access satellite imagery of every part of the world in near real-time. Many products are available within 3-5 hours of being observed. The imagery archive is also being expanded to include more historical products along with those from newly-launched sensors. Visit
MOPITT Imagery in Worldview
https://worldview.earthdata.nasa.gov/
OMI Data at Giovanni

https://giovanni.gsfc.nasa.gov/giovanni/
Linkage to OGA Services

• Remote Sensing Information Gateway (RSIG)
  • Coordinate with EPA partners and host custom code

• WMO/Global Telecommunication System
  • Coordinate with NOAA partners
The DAAC is a Partner and Resource

- Work with DAAC staff up front to create complete metadata and compliant data files
  - Metadata enables discovery
  - Compliant formats make products easy to use
- Discuss customer needs to determine best match-ups with existing services and customer bases
- End-to-end data delivery path and cadence impacts how products are best served
Background
Acronyms

- ASDC - Atmospheric Science Data Center
- DAAC - Distributed Active Archive Center
- EOSDIS - Earth Observing System Data and Information System
- ESDIS - Earth Science Data and Information System
- GIBS - Global Imagery Browse Services
- Giovanni - GES-DISC Interactive Online Visualization AND aNalysis Infrastructure
- LANCE - Land, Atmosphere Near real-time Capability for EOS (LANCE)
- NRT - Near Real-Time
- RSIG - Remote Sensing Information Gateway
TES Subsetter
https://subset.larc.nasa.gov/tes/login.php

Step 1: Select a TES data product and parameter(s)

The data subset options include being able to select data product types and choose a down-selection of parameters to extract. The subset request generated by this interface will only process one data product at a time. Data parameters have been grouped together based on type and are listed in the left most window.

If you choose not to select parameters, then a default package (time, position, and other ancillary information) is put into the resulting output file. The selected parameter grouping(s) are added to the center window. The far right window displays the complete listing of the data parameters that will be included in your output file.

Users wanting all data variables in the file must select all parameter groupings.

Choose Data Product: TES-Aura Level 2 Ozone (O3) Nadir

Choose Parameter Group(s):
- Atmospheric Conditions
- Cloud Data
- TES Data Identifiers
- Matrices
- Metadata Specification
- Quality Assurance
- Surface Conditions
- System Specifications
- Ozone Data

Selected Parameter Group(s):
- Ozone Data

Data variables included in the output file:
- **Default**
  - Time
  - Longitude
  - Latitude
- **Ozone Data**
  - O3
  - O3Precision
  - OzoneIRK
  - OzoneTroposphericColumn
  - OzoneTroposphericColumnError

Step 2: Select a temporal range (optional)

Use the temporal options to narrow your search to a specific temporal domain. If you do not make a temporal selection, the default is to search the complete range of time in which the satellite has acquired data. If you limit your search to a specific time domain, the search will return all available data that intersect with your selected time range.

Calendar dates