

National Aeronautics and
Space Administration



EXPLORE EARTH

Science Directorate

Atmospheric Science Data Center (ASDC)

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3/29/2023

A vibrant space-themed background featuring a large blue circle on the right side. The background is filled with various celestial bodies: a bright yellow sun in the lower left, a large blue planet (Earth) at the bottom, a dark blue planet (Moon) in the center, a ringed planet (Saturn) on the left, and a reddish planet (Mars) at the top. The sky is a mix of blue, green, and yellow, with numerous stars and nebulae.

EXPLORE EARTH

Agenda

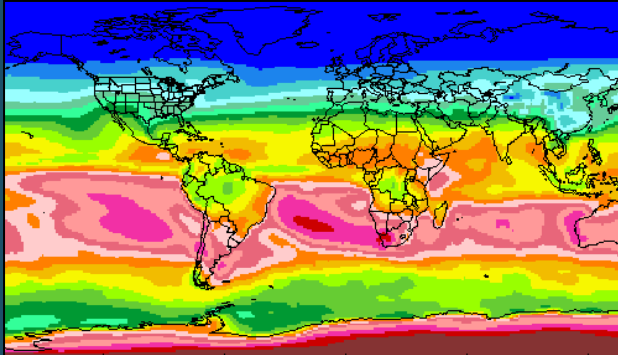
ASDC Overview

Earthdata Tools and Services

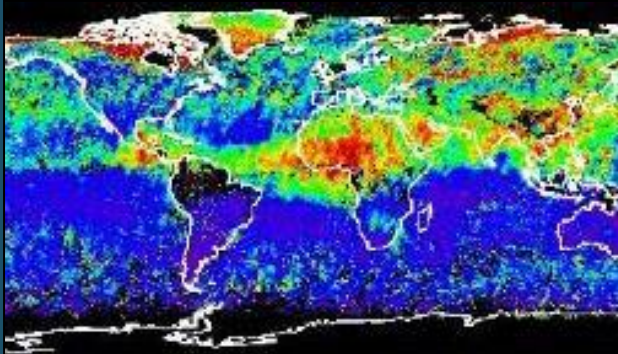
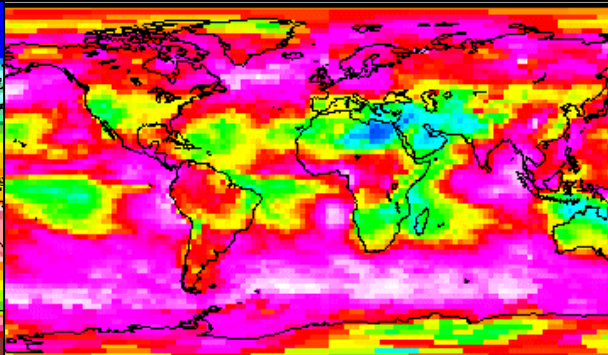
ASDC Tools and Services

ASDC at a Glance

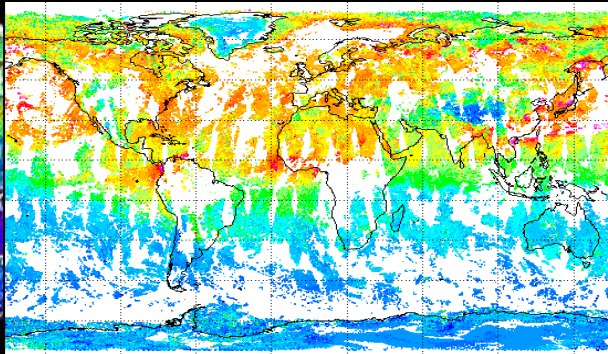
RADIATION BUDGET



CLOUDS



AEROSOLS



TROPOSPHERIC COMPOSITION

- ✓ 44+ Science projects
 - MISR ◦ MOPITT ◦ MAIA ◦ TEMPO ◦ CERES
 - CALIPSO → RSIG (EPA)
 - Airborne field campaigns (KORUS AQ, DISCOVER AQ, FIREX AQ)
- ✓ 1100+ unique science products
- ✓ Data usage (2022)
 - 3.5 Petabytes ◦ 160,000 users
 - 158 countries
- ✓ Data archive (2022)
 - 6.5 Petabytes ◦ 168 million files (5,500 TB) on high-speed disks
- ✓ Data in cloud (ongoing)
 - Data and services in the cloud
 - Scalable infrastructure

Primary Functions of ASDC

Ingest receive data from data provider

Archive preservation & provenance

Distribute tools and services

Process create higher level products

Outreach & Support research community

The background of the slide is a cosmic scene featuring a blue nebula in the upper right and a green nebula in the lower right, with a dense field of stars in the lower left. A dark blue horizontal band is centered across the image, containing the title text.

Earthdata Tools and Services

Earthdata Website

- Data Tools
- Data Recipes
- Data Pathfinders
- Webinars and Tutorials

The screenshot shows the Earthdata website homepage. At the top, there is a navigation bar with the Earthdata logo and the tagline "OPEN ACCESS FOR OPEN SCIENCE". The main header features a series of colorful circular icons representing various Earth science disciplines. Below this, the text reads "Your Gateway to NASA Earth Observation Data" and "The Earth Science Data Systems (ESDS) Program provides full and open access to NASA's collection of Earth science data for understanding and protecting our home planet. Begin your Earthdata exploration by clicking on any of the discipline icons above." Three buttons labeled "Get Started", "Find Data", and "Use Data" are positioned below the text. The main content area is divided into two sections: "Data Pathfinders" and "Resource Spotlight". The "Data Pathfinders" section includes a description of the tool and a "View All >" link. The "Resource Spotlight" section features three highlighted topics: "Agriculture", "Open Science", and "Environmental Justice", each with a corresponding icon and a brief description.

<https://www.earthdata.nasa.gov/>



Health and Air Quality Tools and Services

Earthdata Tools and Services

- Earthdata Pub
- Earthdata Search
- WorldView / GIBS
- Earthdata Forum
- OPeNDAP in the Earthdata Cloud
- ArcGIS Enterprise in the Earthdata Cloud
- Giovanni in the Cloud
- AppEEARS

ASDC Tools and Services

- ASDC L2 Subsetters
- SOOT

External Tools and Services

- EPA RSIG

Earthdata Pub

- Request to publish your data at a DAAC
- Submit information and files required to publish your data
- Track the publication status of your data
- Access resources for data producers

EARTHDATA Find a DAAC - Feedback

NASA Earthdata Pub Overview **Beta** Dashboard

NASA Earthdata Pub

Earthdata Pub is the easy, online place for Earth Science researchers to publish their data at a NASA Distributed Active Archive Center (DAAC)

[Get Started](#) [Data Producer Resources](#)

What is Earthdata Pub?

Earthdata Pub is the easy, online place for Earth Science researchers to publish their data at a NASA Distributed Active Archive Center (DAAC). Using Earthdata Pub you can:

- Request to publish your data at a DAAC
- Submit information and files required to publish your data
- Track the publication status of your data
- Access resources for data producers

Earthdata Pub Features

With Earthdata Pub you can create and track your request in a seamless workflow. Some of the features that we provide are:

[Guided Process](#) [Real-time Tracking](#) [Collaborate with DAACs](#)

<https://pub.earthdata.nasa.gov/>

Earthdata Search

- Search and Order
 - On Premise
 - Amazon Web Services
- Subsetting & Aggregation
- Browse Imagery
- File Conversions
- Application Programming Interface (API) Access

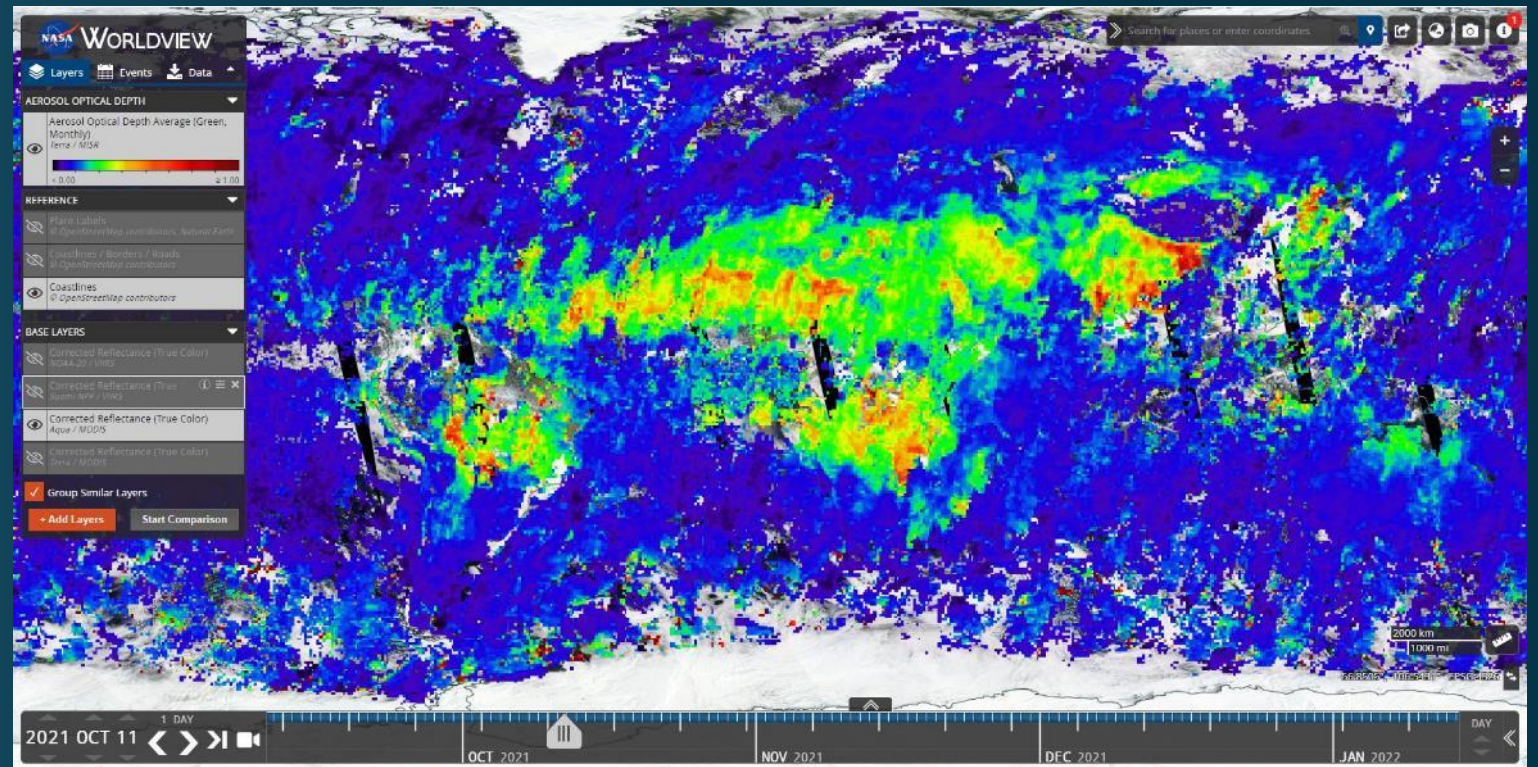
The screenshot displays the Earthdata Search web application. The search results are for 'TEMPO NO2 tropospheric column PROXY'. The results table shows multiple granules with columns for ID, START, and END. A map on the right shows the Arctic region with a blue circle highlighting a specific location. The interface includes a search bar, filters, and a 'Download All' button.

ID	START	END	ID	START	END
TEMPO_NO2_PROXY_L2_V01_201404_3072235962_001500.nc	2014-04-30 22:00:00	2014-04-30 22:00:00	TEMPO_NO2_PROXY_L2_V01_201404_3072235962_001500.nc	2014-04-30 22:00:00	2014-04-30 22:00:00
TEMPO_NO2_PROXY_L2_V01_201404_3072235962_001500.nc	2014-04-30 22:00:00	2014-04-30 22:00:00	TEMPO_NO2_PROXY_L2_V01_201404_3072235962_001500.nc	2014-04-30 22:00:00	2014-04-30 22:00:00
TEMPO_NO2_PROXY_L2_V01_201404_3072235962_001500.nc	2014-04-30 22:00:00	2014-04-30 22:00:00	TEMPO_NO2_PROXY_L2_V01_201404_3072235962_001500.nc	2014-04-30 22:00:00	2014-04-30 22:00:00
TEMPO_NO2_PROXY_L2_V01_201404_3072235962_001500.nc	2014-04-30 22:00:00	2014-04-30 22:00:00	TEMPO_NO2_PROXY_L2_V01_201404_3072235962_001500.nc	2014-04-30 22:00:00	2014-04-30 22:00:00

<https://search.earthdata.nasa.gov>

Worldview / Global Imagery Browse Service (GIBS)

- Browse Imagery
- Animations
- Event Information
- GIBS API



<https://worldview.nasa.gov>

OPeNDAP

- API Access
- Subsetting & Aggregation
- File Conversions

Welcome to the new
OPeNDAP Data Access Form
The old form can be found here.

dataset: CERES_EBAF_Edition4.1_200003-202111.nc

Actions

Data URL

Global Attributes MC_GLOBAL

Variables

- lon[lon= 0 ..359] (Dim 0)
 attributes
- lat[lat= 0 ..179] (Dim 1)
 attributes
- ctime[time= 0 ..11] (Dim 2)
 attributes
- climatology_bounds[time= 0 ..11] [lon= 0 ..1] (Dim 3)
 attributes
- time[time= 0 ..260] (Dim 4)
 attributes
- toa_sw_all_mon[time= 0 ..260] [lat= 0 ..179] [lon= 0 ..359] (Grid of Float32 values)
 attributes
- toa_lw_all_mon[time= 0 ..260] [lat= 0 ..179] [lon= 0 ..359] (Grid of Float32 values)
 attributes
- toa_net_all_mon[time= 0 ..260] [lat= 0 ..179] [lon= 0 ..359] (Grid of Float32 values)
 attributes
- toa_sw_clr_c_mon[time= 0 ..260] [lat= 0 ..179] [lon= 0 ..359] (Grid of Float32 values)
 attributes
- toa_lw_clr_c_mon[time= 0 ..260] [lat= 0 ..179] [lon= 0 ..359] (Grid of Float32 values)
 attributes
- toa_net_clr_c_mon[time= 0 ..260] [lat= 0 ..179] [lon= 0 ..359] (Grid of Float32 values)
 attributes

<https://opendap.earthdata.nasa.gov>

ArcGIS Enterprise in the Earthdata Cloud

- Geospatial Services
- Maps
- StoryMaps
- Applications

Studying the 2019-2020 Australian Bushfires Using NASA Data

Introduction 1) Conditions for Fire Activit... 2) An Unprecedented Fire Seaso... 3) Atmospheric Composition 4) Particulate Matter & Pa... Exploring NASA's Data

MISR Plume Height

The geographic region where the plume height data is aggregated.

We can tell the height of a cloud or smoke plume above Earth's surface by viewing it from space at different angles. A plume located high above the surface will appear to move considerably relative to the underlying surface when viewed at different angles, whereas a plume closer to the surface will appear to shift less.

The Multi-angle Imaging SpectroRadiometer (MISR) instrument aboard the NASA Terra satellite

Exaggerated (20x) Plume Height on 12/16/19

Active Aerosol Plume (AAP) project, V. Flower, R. Kahn, K. Jungheer, N. Reyes

Waiting for services7.arcgis.com... | Jarmín, FAO, NOAA, USGS | Source: USGS, NGA, NASA, OGIAR, GEBCO, N. Robinson, NCEAS, NLS, OS, NMA, Geodesy/reiser and the GIS User Community | Active Aerosol Plume (AAP) Project, V. Flower, R. Kahn, ... | Powered by Esri

<https://gis.earthdata.nasa.gov>

Giovanni

- Time Series
- Time Averaged Maps
- Comparisons
- Vertical Cross Sections

The screenshot shows the Giovanni Data Selection interface. The top navigation bar includes the GIOVANNI logo, the tagline "The Bridge Between Data and Science v 4.38", and links for Feedback, Help, and Log out (mstsdal). The main interface is divided into several sections:

- Select Plot:** A dropdown menu set to "Time Averaged Map".
- Select Date Range (UTC):** A date range selector showing "YYYY - MM - dd 00 : 00 to YYYY - MM - dd 23 : 59". The valid range is "2000-04-01 to 2022-05-01". A red error message states "Please specify a start date".
- Select Region (Bounding Box or Shape):** A text input field containing "-180, -90, 180, 90".
- Select Variables:** A sidebar menu with categories: Observations (0), Disciplines (Atmospheric Chemistry (9)), Measurements, Platform / Instrument (AIRS (88), GEOS-CHEM (2), MERIA-2 Model (138), MODIS-Aqua (3), MODIS-Terra (2), MOPITT (9), OMI (7), TOMS EP (1), TOMS Meteor 3 (1), TOMS Nimbus-7 (1)), Spatial Resolutions, Temporal Resolutions, and Portal.
- Table of Results:** A table with columns: Variable, Units, Source, Temp. Res., Spet. Res., Begin Date, End Date, and Vert. Slice. The table lists 9 variables, with "Multispectral CO Mixing Ratio Profile (Daytime/Descending) (MOP03TM v008)" selected. The "Number of matching Variables: 9 of 1967" and "Total Variable(s) included in Plot: 1" are displayed above the table.

At the bottom of the interface, there is a footer with the NASA logo, "Responsible NASA Official: [Angela Li](#)", "Web Curator: [M. Hegde](#)", "Privacy", "Powered By", and "Contact Us". On the right side of the footer, there are "Reset" and "Plot Data" buttons.

<https://giovanni.earthdata.nasa.gov>

Earthdata Forum

- View Existing Questions/Answers
- Ask New Questions to Subject Matter Experts
- Science and Technical Support

The screenshot displays the Earthdata Forum website. At the top, there is a navigation bar with the Earthdata logo and the text "Welcome to the Earthdata Forum! Here, the scientific user community and subject matter experts from NASA Distributed Active Archive Centers (DAACs), and their contributors, discuss research needs, data, and data applications." Below the navigation bar, there are several filter options for "Questions/Comments":

- Filter by Best Answer: With a Best Answer, Without a Best Answer
- Filter by Topic: [Dropdown]
- Selected Tag Match: ANY, HYBRID, ALL
- Filter by Discipline: [Dropdown]
- Filter by DAAC: [Dropdown]
- Filter by Product: [Dropdown]
- Filter by Service/Usage: [Dropdown]
- Filter by Date: [Dropdown]
- Filter by Author: [Dropdown]

Below the filters, there is a "Reset all filters" button. The main content area is titled "Questions/Comments" and features an "ANNOUNCEMENTS" section with several items:

- FLASHFlux Data
- UPDATE: Terra data and imagery outage starting October 10th 2022
- GCMD Keywords Version 14.5 Released
- Disaster Assessment Using Synthetic Aperture Radar: Open, Online NASA ARSET Training Invitation
- Best Practices For Using Machine Learning Keywords in Collection and Service Records in the CMR

Below the announcements, there is a table of "QUESTIONS AND COMMENTS" with columns for "REPLIES" and "LAST POST".

QUESTIONS AND COMMENTS	REPLIES	LAST POST
Can I get weather details ? ASDC Atmosphere	1	by ASDC - Ingrida e Tue Jul 26, 2022 9:41 am America/New_York
SAGE III on ISS Version 5.21 Release ASDC Announcements Atmosphere SAGE	0	by ASDC - David W. e Tue Jun 28, 2022 12:01 pm America/New_York
Solar radiation ASDC Atmosphere Data Access DRNL POWER SSE	4	by ASDC - David W. e Tue May 10, 2022 1:56 pm America/New_York
CALIPSO Data Download Doesn't work ASDC Atmosphere CALIPSO Data Download	1	by ASDC - David W. e Mon Mar 28, 2022 3:01 pm America/New_York
Climate scenarios 2.6, 4.5 and 8.5 downscaled data download ASDC Atmosphere Data Access GFS DISC GIDAS/NDAS MERRA-2 POWER SSE	3	by ASDC - David W. e Wed Mar 23, 2022 12:25 am America/New_York
ACCESS TO DATA CONTENT ASDC Atmosphere CALIPSO	1	by ASDC - cheyenne.e.lend e Wed Mar 16, 2022 9:26 am America/New_York
Release Announcement of New CALIPSO V2.00 Lidar Level 2 Polar Stratospheric Cloud Data Product ASDC Announcements Atmosphere CALIPSO Data Access Data Download Data Search	0	by ASDC - Joseph f.boch e Tue Mar 08, 2022 12:31 pm America/New_York
Data discrepancy between CERES and ERA5 ASDC Atmosphere CERES	2	by ASDC - cheyenne.e.lend e Thu Mar 03, 2022 9:04 am America/New_York

<https://forum.earthdata.nasa.gov>



ASDC Tools and Services

ASDC Level 2 Subsetters

- API Access
- Subsetting & Aggregation
- File Conversions

The screenshot shows the 'CALIPSO Search and Subsetting Web Application' interface. At the top, there is a navigation bar with a home icon, the application name, 'Set Search Criteria', and a 'Logout' button. Below this is a secondary navigation bar with buttons for 'Data Users Guide', 'Data Products Catalog', 'Data Quality Summaries', and 'Frequently Asked Questions'. The main content area is titled 'Step 1: Select a CALIPSO data product and parameter(s)'. It contains several paragraphs of text explaining the subsetting process and a form for selecting parameters. The form includes a 'Choose Granule Type' section with 'Day', 'Night', and 'Both' buttons. Below that is a 'Choose Data Product' dropdown menu set to 'LIDAR Level 1 Version 4.51'. The 'Choose Parameter Group(s):' section features a list of parameter groups with 'Add', 'Add all', 'Remove', and 'Remove all' buttons. The 'Selected Parameter Group(s):' section is currently empty. The 'Data variables included in the output file:' section shows a list of default variables including Latitude, Longitude, Day_Night_Flag, GMAO_Surface_Elevation, IGBP_Surface_Type, Land_Water_Mask, Off_Nadir_Angle, Profile_ID, and Profile_Time.

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

The data subset options include being able to select CALIPSO day and/or night granules, selecting data product types and choosing a down-selection of parameters to extract. 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 Granule Type: Day Night Both

Choose Data Product: LIDAR Level 1 Version 4.51

Choose Parameter Group(s):

- Instrument
- 532nm Calibration
- 1064nm Calibration
- 532nm Backscatter
- 1064nm Backscatter
- 532nm Reflectance
- 532nm Surface Characterization
- 1064nm Surface Characterization
- Atmospheric
- Spacecraft and Footprint

Selected Parameter Group(s):

Data variables included in the output file:

Default

- Latitude
- Longitude
- Day_Night_Flag
- GMAO_Surface_Elevation
- IGBP_Surface_Type
- Land_Water_Mask
- Off_Nadir_Angle
- Profile_ID
- Profile_Time

Sub-Orbital Order Tool (SOOT)

- Search and Access Sub-Orbital Data
- Merge to Common Time Scale

Sub-Orbital Order Tool (SOOT) Power User Interface

Welcome to the [Sub-Orbital Order Tool \(SOOT\)](#) which is designed to promote suborbital research and analysis. Here you can discover and access the airborne and field campaign data archived at the Atmospheric Science Data Center (ASDC). The SOOT Power User Interface is intended for experienced airborne data users and airborne science teams.

Select a campaign and deployment: 

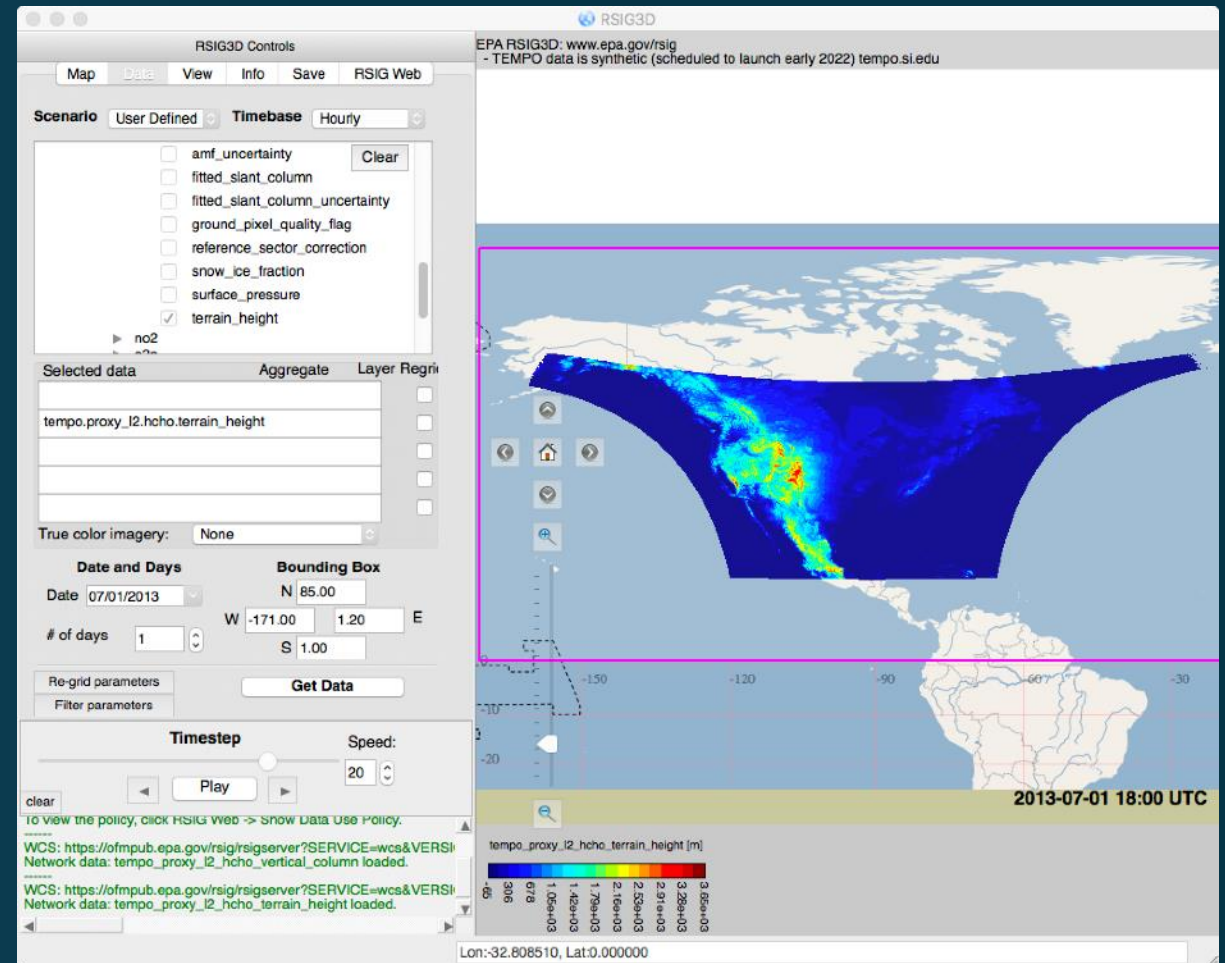
 ACEPOL Support Documentation 2017	 ACTIVATE Support Documentation 2020 2021 2022	 Aeolus Cal/Val Support Documentation 2019
 AJAX Support Documentation 2011 2012 2013 2014 2015 2016 2017 2018	 ARISE Support Documentation 2014	 CAMP2EX 2018 2019
 DCOTSS 2021	 FIREX-AQ 2019	 LISTOS Support Documentation 2017 2018 2019
 LMOS 2017 Support Documentation 2017	 NAAMES Support Documentation 2015 2016 2017 2018	 ORACLES 2016 2017 2018

The background of the slide is a cosmic scene. The top half features a dark blue and black space with a prominent blue nebula on the right side and several bright, multi-pointed stars. The bottom half is dominated by a warm, golden-yellow and orange glow, with a greenish nebula on the right and a dense field of smaller, dimmer stars. A dark blue horizontal band runs across the middle, containing the title text.

External Tools and Services

EPA Remote Sensing Information Gateway (RSIG)

- Visualization (2D/3D) & Animations
- Subsetting to CMAQ Modeling Grids
- File Conversions
- API Access





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