



Level-1 and Atmosphere Archive & Distribution System
Distributed Active Archive Center



Harmony Services: Subset, Regrid, and Reproject MODIS Data in the Cloud

*Streamlining NASA Earth Observation Data Access with
Geoloco and Subset-band-name*

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Agenda



What is LAADS DAAC?



What are Harmony Services?



Subset-Band-Name Service



Geoloco Service



Available Collections



Live Demonstrations



Level-1 and Atmosphere Archive & Distribution System
Distributed Active Archive Center



LAADS

Level-1 and
Atmosphere
Archive &
Distribution
System

DAAC

Distributed
Active
Archive
Center





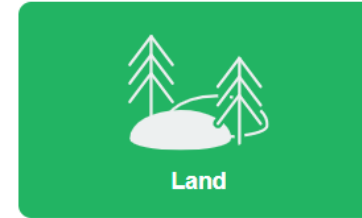
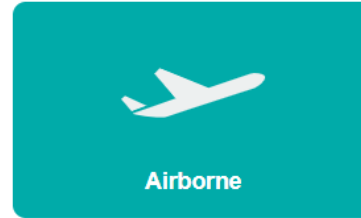
What is LAADS DAAC?

Your Source for Level-1 and Atmospheric Data

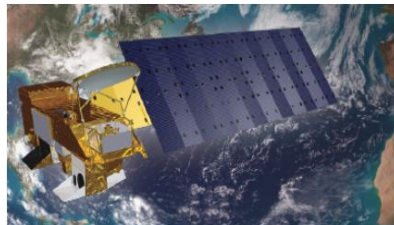
Providing Access to Global Science Data Projects

[View Data](#)

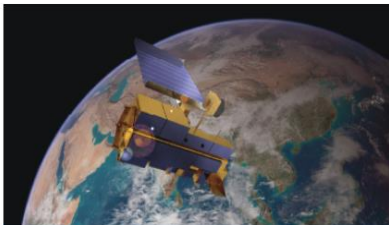
[Find Data](#)



LAADS DAAC primarily archives and distributes data on clouds, water vapor, and aerosols in Earth's atmosphere as well as key instrument data for NASA, NOAA and European Space Administration missions. LAADS DAAC also serves as a backup source for MODIS and VIIRS land products.



Aqua MODIS



Terra MODIS



SNPP | JPSS-1 VIIRS



Envisat MERIS



Sentinel-3 OLCI



Sentinel-3 SLSTR



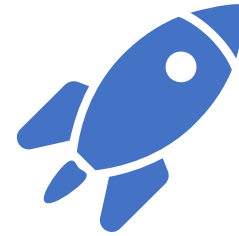
What are Harmony Services?



Allow seamless analysis of
Earth observation data
from different NASA data
centers



Cloud-based data
processing and
transformation



Part of NASA
Earthdata
ecosystem





Why are Harmony Services Useful?

- **Key Benefits:**

- Increase usage and ease of use of EOSDIS Cloud data
- Consistent access patterns across data centers
- Data reduction services (request only needed data)
- Analysis-ready data delivery
- Reduced time-to-science
- Community development opportunities





Who Can Use Harmony Services?



Requirement: Earthdata
Login account



Available to all registered
users



Accessible through
Earthdata Search



Integration with existing
NASA data workflows





What is Subset-Band-Name?



Capability: Subsetting HDF4/HDF-EOS2 SDS variables by band and name



Target: MODIS 6.1 collections



Benefit: Reduces file sizes for downloads



Function: Band differentiation by wavelength ranges



Subset Band Name - Purpose & Benefits

Why Use It:

- Customize datasets by band and name before downloading
- Reduce data volume and save bandwidth
- Create analysis-ready data
- Time-saving for researchers
- **Context:** MODIS L1B has spectral bands with specific applications



MODIS L1B Band Applications Table

[*MODIS Calibration General Information](#)

Primary Use*	Band
Land/Cloud/Aerosols Boundaries	1 – 2
Land/Cloud/Aerosols Properties	3 – 7
Ocean Color/Phytoplankton/Biogeochemistry	8 – 16
Atmospheric Water Vapor	17 – 19
Surface/Cloud Temperature	20 – 23
Atmospheric Temperature	24 – 25
Cirrus Clouds Water Vapor	26 – 28
Cloud Properties	29
Ozone	30
Surface/Cloud Temperature	31 – 32
Cloud Top Altitude	33 - 36



What is Geoloco?



Capability:

Reprojecting, resampling, regridding and spatial subsetting



Target:

MODIS 6.1 collections



Benefit:

Works with HDF4/HDF-EOS2 SDS variables



Function:

Automatic geolocation file retrieval from S3



Geoloco - Purpose & Benefits



Customize datasets
by geographic
location



Reduce download
data volume



Save time and
bandwidth



Deliver analysis-
ready data



Works with L1B-L4
granules





Service Chain Integration: Subset-band-name + Geoloco:

- **Step 1:** Subset-band-name performs variable and band subsetting
- **Step 2:** Geoloco handles reprojection, regridding, resampling, and spatial subsetting

- Eliminates transformation duplication
- Streamlined workflow for users





Available Collections

MODIS Collections Ready for Processing:

MO/YD02QKM	MO/YD05_L2
MO/YD02HKM	MO/YD06_L2
MO/YD021KM	MO/YD07_L2
MO/YD02SSH	MO/YD35_L2
MO/YD03	MO/YD09
MO/YD04_L2	MO/YDATML2
MO/YD04_3K	MOD08_D3





Timeline & Future Collections



Current Status: Listed collections
available now



New Update: More gridded L3
collections





Demo Overview

Two Demonstration Components:

1. [Earthdata Search](#) access method
2. [Harmony](#) basic scripts and [Jupyter Notebook](#) integration





Demo 1 - Earthdata Search

- Video demonstration of [Earthdata Search](https://earthdata.nasa.gov/earthdata-search) access
- Link:
<https://youtu.be/nrs2wTbcp-M>





Demo 2 - Harmony Scripts & Jupyter Notebooks

Topics Covered:

- Introduction to Harmony basic scripts
- Open source services integration
- Jupyter Notebook examples
- Implementation in custom scripts
- **Disclaimer:** Licensing in progress through NASA, release expected soon





Getting Started

1

Obtain
Earthdata
Login account

2

Access through
Earthdata
Search

3

Explore
available
collections

4

Try basic
scripts and
examples*



Questions & Support

- <https://forum.earthdata.nasa.gov/> - resource to ask questions
- <https://ladsweb.modaps.eosdis.nasa.gov/learn>
- <https://ladsweb.modaps.eosdis.nasa.gov/learn/using-harmony-tools-in-earthdata-search/>
- <https://ladsweb.modaps.eosdis.nasa.gov/cloud/>

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