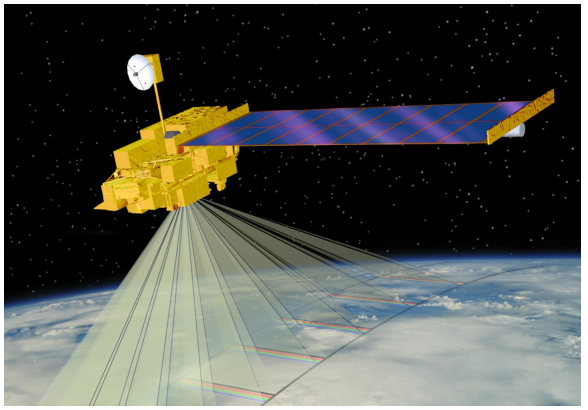
MODIS Direct Broadcast Products and Software



VIIRS/MODIS Workshop
Honolulu Hawaii
August 2013

Liam Gumley
Space Science and Engineering Center
University of Wisconsin-Madison

SSEC

Outline

1. What is MODIS **Direct Broadcast** (DB)?
2. MODIS DB **Image** Products
3. MODIS DB **Atmosphere** Products
4. MODIS DB **Land** products
5. MODIS DB **Ocean** products
6. Software for **interpreting** MODIS DB products
7. **Downloading** MODIS data from the Web

What is Direct Broadcast?

- Direct Broadcast is the real-time transmission of earth observation data from the spacecraft to the ground (via X-band on Terra and Aqua)
- On Terra, only MODIS is broadcast
- On Aqua, all data is broadcast
- Data are free and clear with no encryption

- All you need is an antenna and receiver!
- “Terra and Aqua are a great gift to the world” *(Vladimir Gershenzon, ScanEx)*

Terra

Launched: Dec. 18, 1999

10:30 am descending

ASTER: Hi-res imager

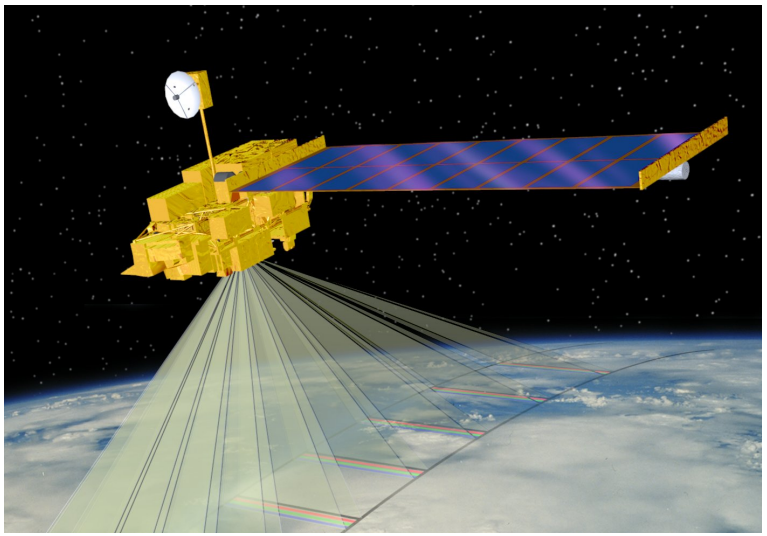
CERES: Broadband scanner

MISR: Multi-angle imager

MODIS: Multispectral imager

MOPITT: Limb sounder

Only MODIS is available by DB



Aqua

Launched: May 4, 2002

1:30 pm ascending

AIRS: Infrared sounder

AMSR-E: Microwave scanner

AMSU: Microwave scanner

CERES: Broadband scanner

HSB: Microwave sounder

MODIS: Multispectral imager

All sensors are available via DB

How do I get Direct Broadcast?

- Direct Broadcast X-band ground stations are available from a number of vendors
- Cost is around $100-300K USD
- NWS/UH operates an X/L-band ground station, and data is freely available
- There are more than 150 of these stations worldwide (on every continent)

There are other ways to get MODIS data…


Shanghai, China


Moscow, Russia
27/11/03 12:58

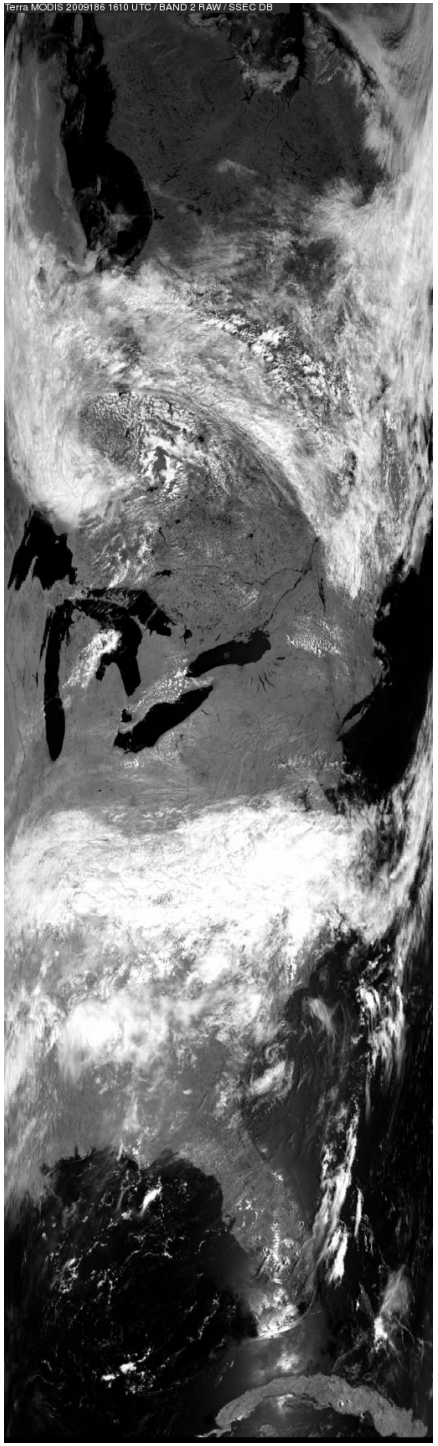

Madison, USA


Benevento, Italy

Worldwide X-band Sites

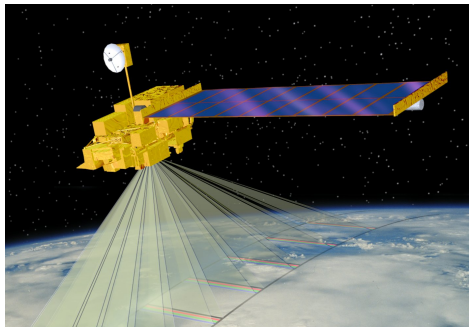
DB Coverage from Madison, WI

Terra, 2009/07/05



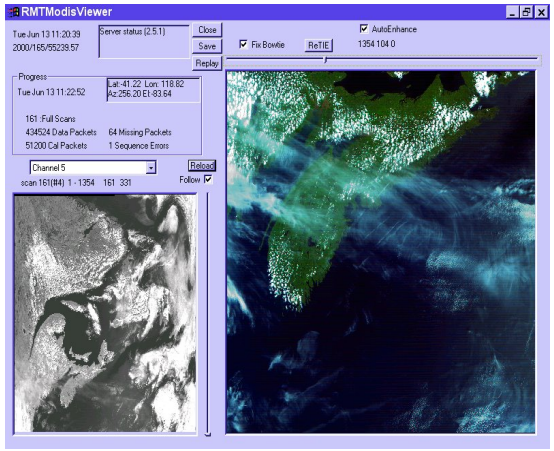
Advantages of DB

Satellite

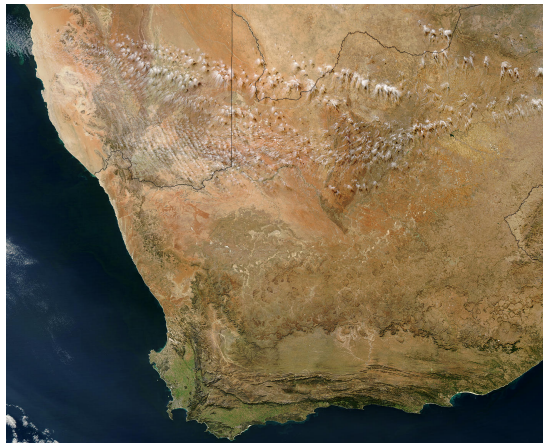


- Local control gives users the freedom to tailor operations to suit local needs
- Timeliness for responding to natural hazards and providing information for decision makers
- Local researchers are free to develop and refine algorithms tuned for local conditions

Ground Station



Processing Software



Products and Applications

Terra and Aqua DB Product Suite

MODIS Level 1B Products (MODISL1DB)
Level 0 quicklook images (visible and infrared)
Level 1B 1KM, HKM, and QKM radiances and geolocation
Destriping corrections for Level 1B 1KM infrared radiances

MODIS Atmosphere Level 2 Products (IMAPP)
Cloud Mask
Cloud Top Pressure, Phase, Emissivity, Optical Depth
Aerosol Optical Depth
Temperature and Water Vapor Profiles
Total Column Precipitable Water Vapor
Total Column Ozone
Level 2 browse images for all Atmosphere Products

MODIS Land Products (DRL)
Corrected Reflectance 1KM, HKM, QKM
Fire Detection / Thermal Anomalies
Land Surface Temperature (LST)
Normalized Difference Vegetation Index (NDVI)
Enhanced Vegetation Index (EVI)
Land Surface Reflectance

MODIS Ocean Products (SeaDAS)
Chlorophyll-A Concentration
Sea Surface Temperature (SST)

MODIS Images (HDFLook)
Level 1B browse images (visible, infrared, true color)
Level 2 Land browse images (NDVI, LST)
Level 2 Ocean browse images (Chlorophyll-A, SST)

MODIS Google Earth KML (IMAPP)
MODIS 250 meter resolution true color JPEG images and KML

AIRS Level 1 and Level 2 (IMAPP)
Level 1B data (including AIRS IR, AIRS VIS, and AMSU)
Level 2 retrievals of temperature and moisture

AMSR-E Level 1 and Level 2 (IMAPP)
Geolocated and calibrated antenna temperatures
Rain Rate
Soil Moisture
Snow Water Equivalent

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MODIS DB Level 1 Image Products

Software: **MODISL1DB**

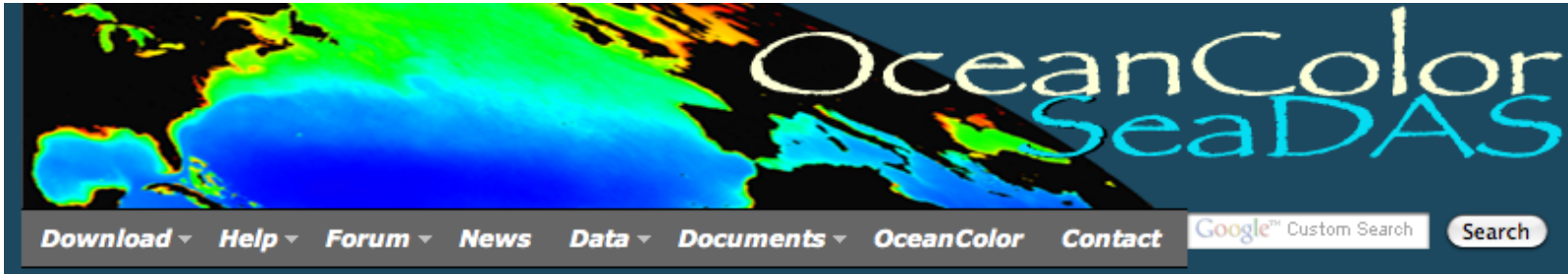
Developers: MODIS Characterization Support Team, MODIS Science Team, NASA Ocean Biology Processing Group

Distributor: NASA Ocean Biology Processing Group

Platforms: Linux, OS X, Windows (VM)

http://oceancolor.gsfc.nasa.gov/seadas/modisl1db/

Free Download



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MODISL1DB 1.7 (Released January 5, 2011)

MODISL1DB is a MODIS Level-1 Direct Broadcast software package capable of processing MODIS Aqua and Terra Level 0 data to Level 1A and Level 1B.

This software is a culmination of various efforts made by the MODIS Science and Calibration Teams, including the latest processing source codes from the MODIS Science Data Support Team (SDST), the MODIS Characterization Support Team (MCST), and the Ocean Biology Processing Group (OBPG). Thanks also goes out to SSEC for continued support.

Processing MODIS data with MODISL1DB will result in identical products to those produced by the OBPG if the same calibration LUTs are used.

Notable changes in this release are:

- Updated to the l1agen and geogen programs
- Added 64bit Linux support
- Processing scripts have been modified:
  - modis_L0_to_L1A_GEO.csh -> modis_L1A.csh (GEO creation removed)
  - modis_L1A_to_GEO.csh -> modis_GEO.csh
  - modis_L1A_to_L1B.csh -> modis_L1B.csh

For more details see the Version History.

The main MODISL1DB user support medium is the **MODIS Direct Broadcast Support Forum** (one of the Ocean Color Forums). If you would like to contact us directly, please feel free to send questions or comments to seadas at seadas.gsfc.nasa.gov.

What does MODISL1DB do?

Purpose: **Convert raw MODIS telemetry files to calibrated and geolocated Level 1B image products**

Input Data: **Level 0 CCSDS Packet Files containing APID 64 (MODIS) for Terra and Aqua; and APID 957 (GBAD) for Aqua**

Output Data: **MODIS Level 1B 1KM, HKM, QKM, and Geolocation (HDF4 format)**

MODIS Level 1B Data

- MODIS Level 1B data contains calibrated and geolocated radiance or reflectance values observed by the instrument (top of atmosphere)
- MYD02 is the Aqua product ID (Terra=MOD02)
- MYD021KM = 1000 meter resolution

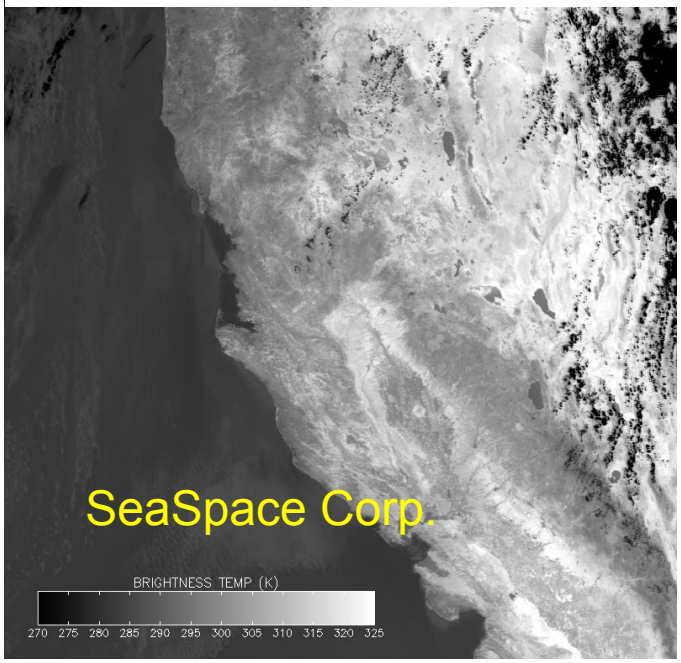
  (1354 pixels across track by 2030 pixels along track for a standard 5-minute granule or scene)
- MYD02HKM = 500 meter resolution (2708 x 4060)
- MYD02QKM = 250 meter resolution (5416 x 8120)

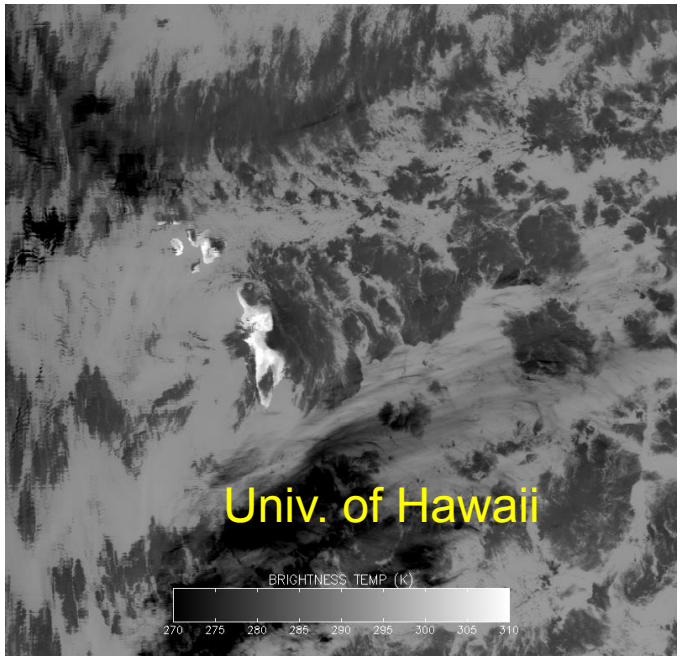
DB granules may be larger (up to 14 minutes long)

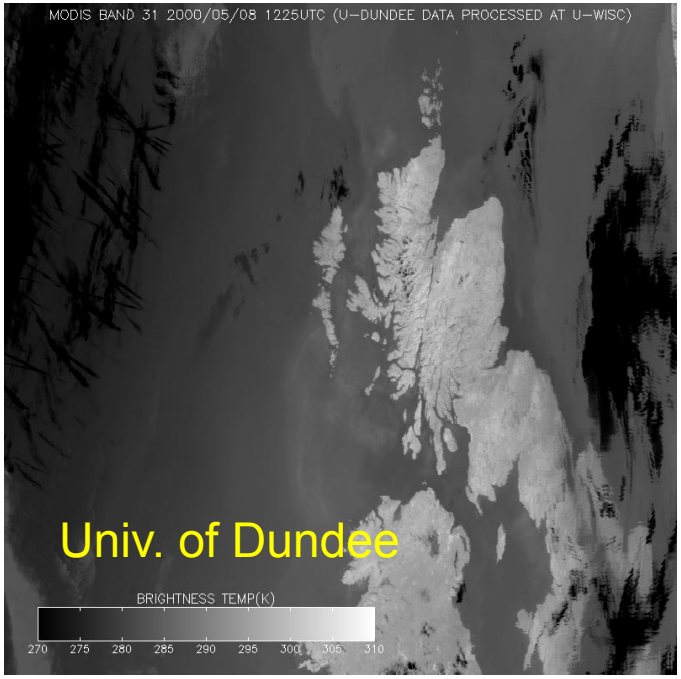
MODIS Level 1B Contents

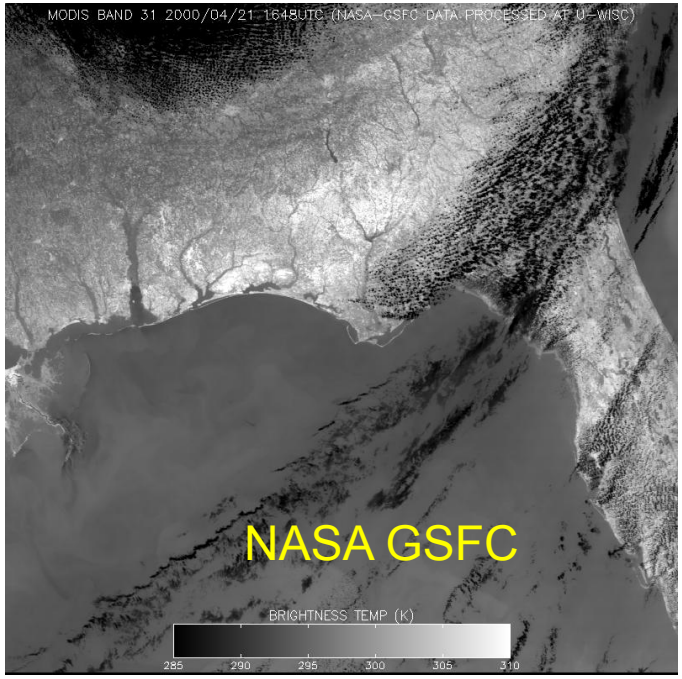
- Format is Hierarchical Data Format v4 (HDF4)
- Image data are stored as scaled integers, with linear slope and intercept to convert to calibrated radiance or reflectance
- Geolocation data at 1000 meter resolution are stored in a separate file (MYD03), along with sensor viewing geometry and solar geometry
- Daytime 1KM granules contain all 36 bands at 1000 meter resolution
- Nighttime 1KM granules contain bands 20-36 only
- HKM and QKM granules are daytime only

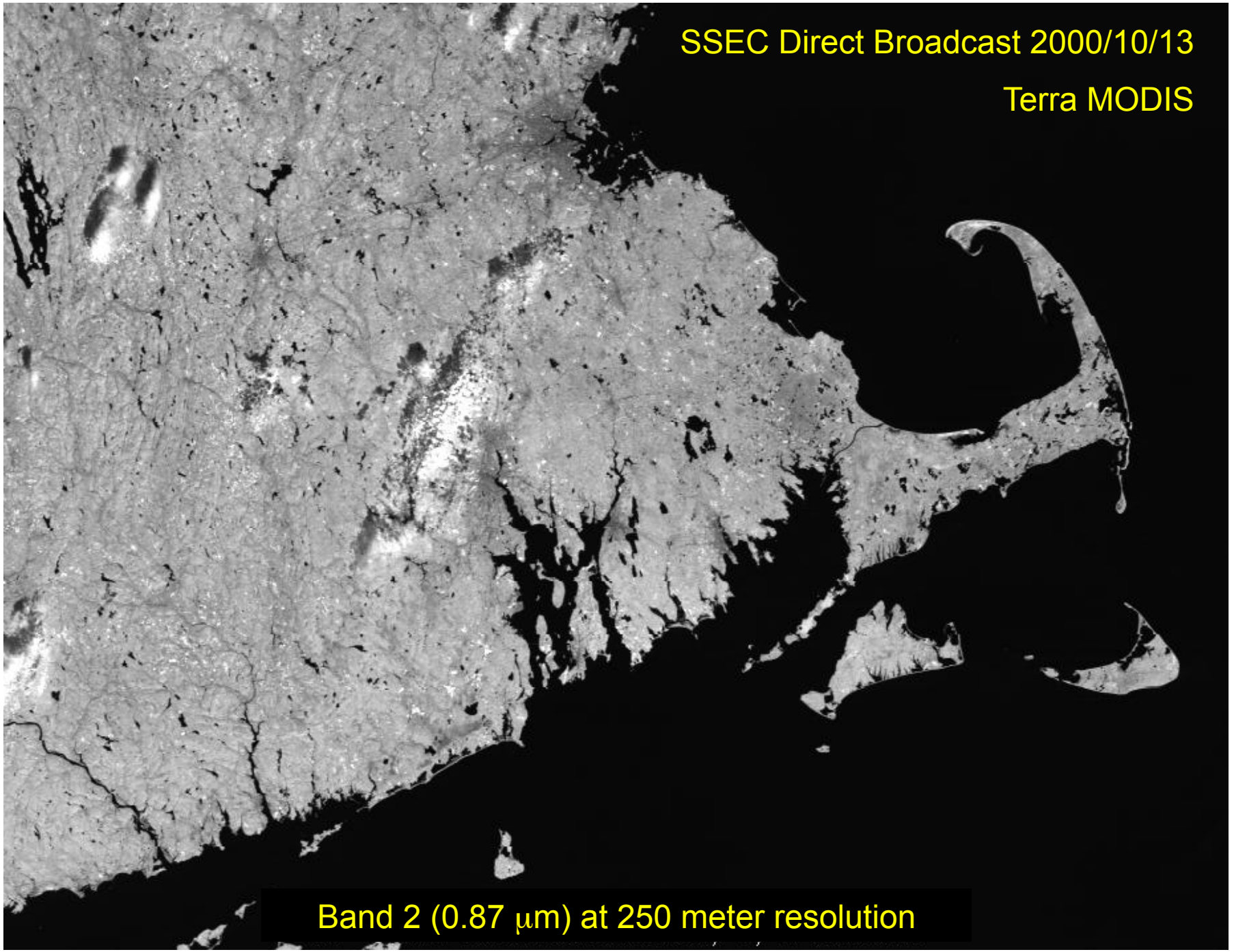
MODIS Band 31, Acquired by four different DB ground stations









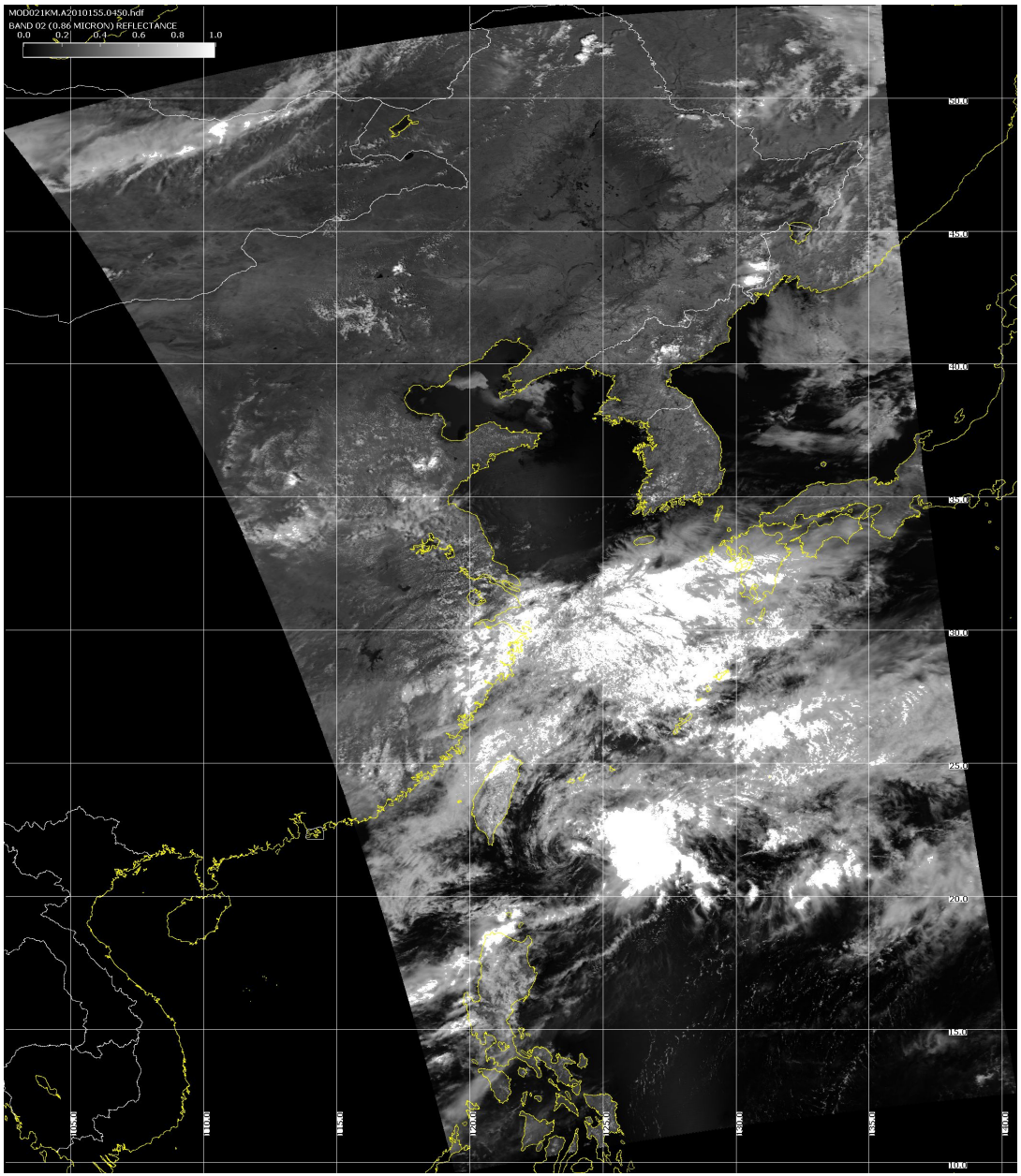

SSEC Direct Broadcast 2000/10/13
Terra MODIS
Band 2 (0.87 μm) at 250 meter resolution

Band 2 (visible)

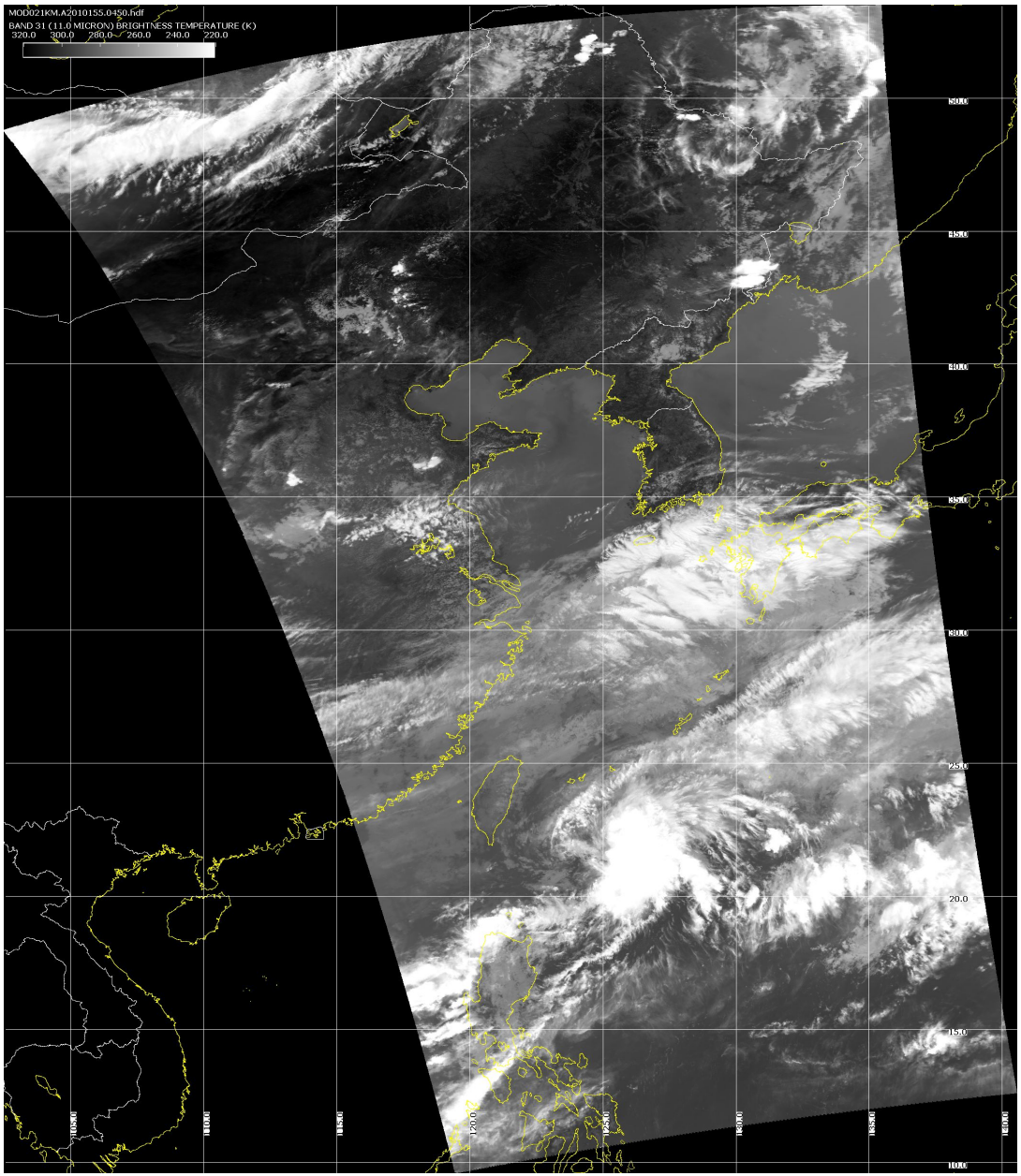
Aqua MODIS

2010/06/04

04:55 UTC



Band 31 (infrared)

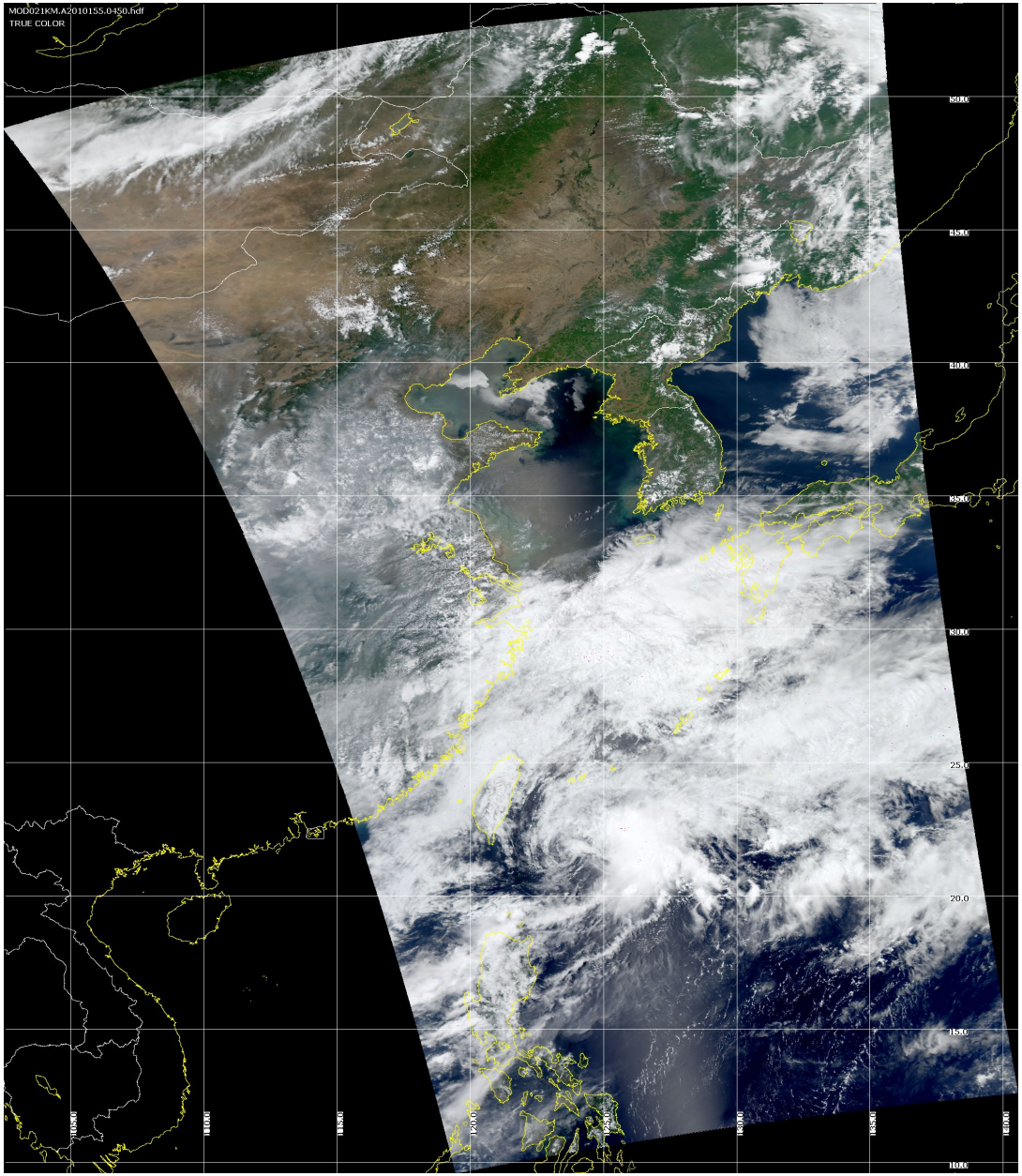


Aqua MODIS

2010/06/04

04:55 UTC

True Color



Aqua MODIS

2010/06/04

04:55 UTC

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MODIS DB Atmosphere Products

Software: **International MODIS/AIRS Processing Package (IMAPP)**

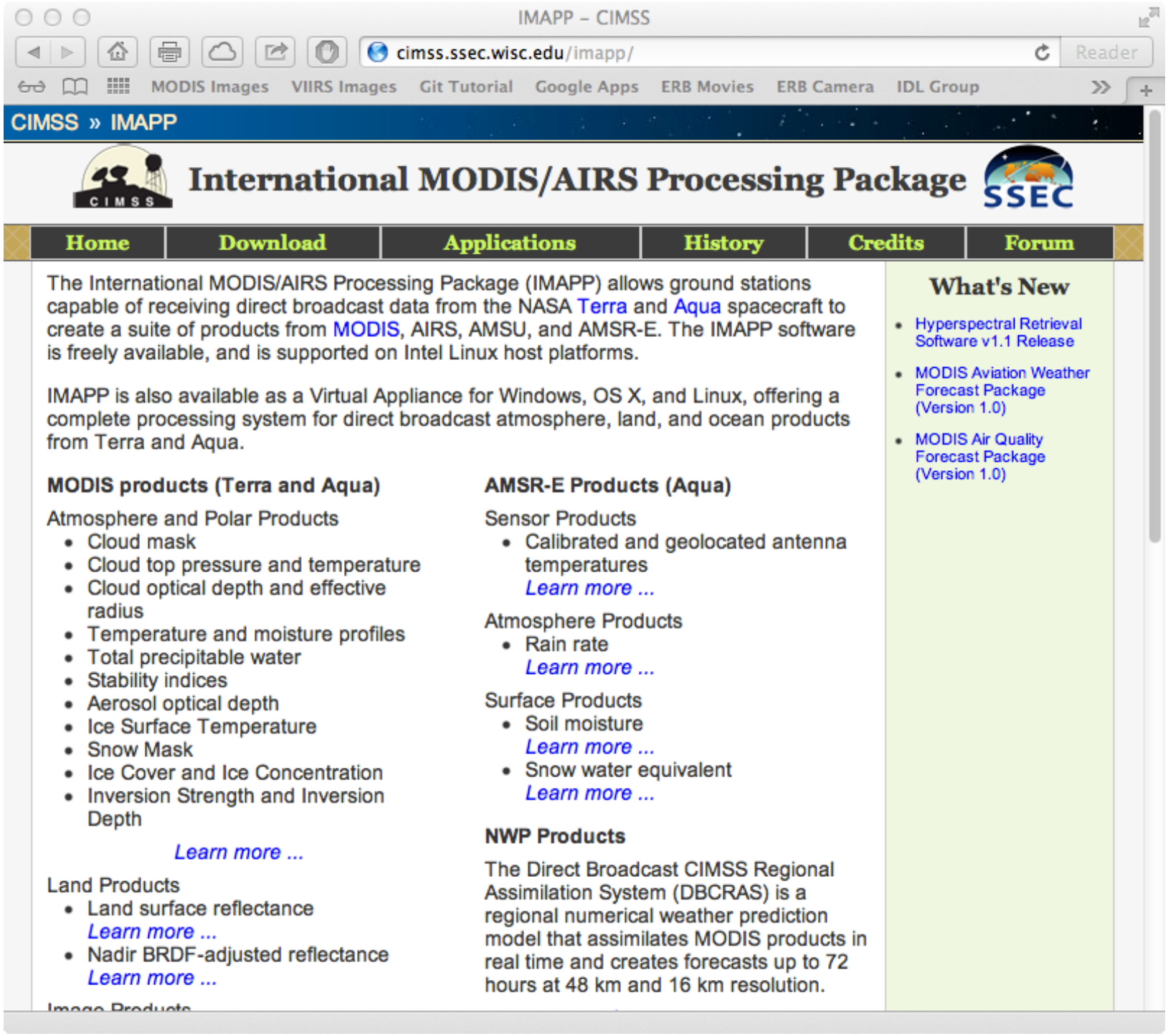
Developers: University of Wisconsin-Madison, MODIS Science Team, Remote Sensing Systems, Free University of Berlin

Distributor: University of Wisconsin-Madison

Platforms: Linux, Windows (VM)

Website: http://cimss.ssec.wisc.edu/imapp/

Free Download


IMAPP – CIMSS
cimss.ssec.wisc.edu/imapp/
Reader
MODIS Images
VIIRS Images
Git Tutorial
Google Apps
ERB Movies
ERB Camera
IDL Group
CIMSS » IMAPP
International MODIS/AIRS Processing Package
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The International MODIS/AIRS Processing Package (IMAPP) allows ground stations capable of receiving direct broadcast data from the NASA Terra and Aqua spacecraft to create a suite of products from MODIS, AIRS, AMSU, and AMSR-E. The IMAPP software is freely available, and is supported on Intel Linux host platforms.
IMAPP is also available as a Virtual Appliance for Windows, OS X, and Linux, offering a complete processing system for direct broadcast atmosphere, land, and ocean products from Terra and Aqua.
MODIS products (Terra and Aqua)
Atmosphere and Polar Products
Cloud mask
Cloud top pressure and temperature
Cloud optical depth and effective radius
Temperature and moisture profiles
Total precipitable water
Stability indices
Aerosol optical depth
Ice Surface Temperature
Snow Mask
Ice Cover and Ice Concentration
Inversion Strength and Inversion Depth
Learn more ...
Land Products
Land surface reflectance
Learn more ...
Nadir BRDF-adjusted reflectance
Learn more ...
AMSR-E Products (Aqua)
Sensor Products
Calibrated and geolocated antenna temperatures
Learn more ...
Atmosphere Products
Rain rate
Learn more ...
Surface Products
Soil moisture
Learn more ...
Snow water equivalent
Learn more ...
NWP Products
The Direct Broadcast CIMSS Regional Assimilation System (DBCRAS) is a regional numerical weather prediction model that assimilates MODIS products in real time and creates forecasts up to 72 hours at 48 km and 16 km resolution.
What's New
Hyperspectral Retrieval Software v1.1 Release
MODIS Aviation Weather Forecast Package (Version 1.0)
MODIS Air Quality Forecast Package (Version 1.0)

IMAPP Product List

MODIS Products:

- Cloud Mask (MOD35)
- Cloud Top Properties (MOD06CT)
- Atmospheric Profiles (MOD09)
- Aerosol Optical Depth (MOD04)
- Sea Surface Temperature
- Near Infrared Water Vapor
- Level 1B Destriping
- True Color Images for Google Earth
- Nadir BRDF Adjusted Reflectance
- Ice Surface Temperature
- Snow Mask
- Ice Cover and Concentration
- Inversion Strength and Depth

Other Products:

- AIRS/AMSU Level 1B Calibrated And Geolocated Radiances
- AIRS/AMSU JPL Atmospheric Profiles
- AIRS/MODIS Single FOV Atmospheric Profiles (Clear and Cloudy)
- AIRS/IASI/CrIS Single FOV Retrievals
- DBCRAS Numerical Weather Prediction Model
- Aviation & Severe Weather Products
- Air Quality Forecast Products

What does IMAPP do?

Purpose: **Creates MODIS atmosphere, utility, and image products (and AIRS, AMSU, AMSR-E)**

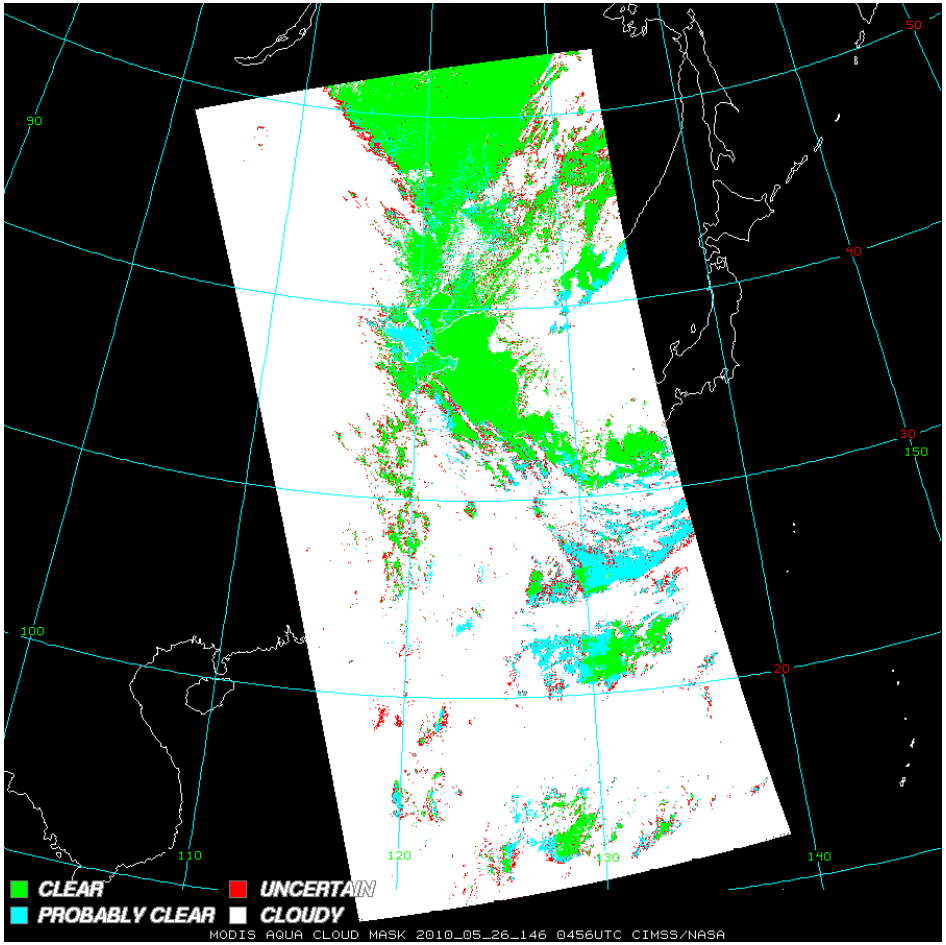
Input Data: **MODIS Level 1B 1KM, HKM, QKM, and Geolocation (HDF4 format)**

Output Data: **MODIS Level 2 Cloud Mask, Cloud Top Properties, Atmospheric Temperature and Water Vapor Profiles, Total Ozone, Total Precipitable Water Vapor (HDF4 format)**

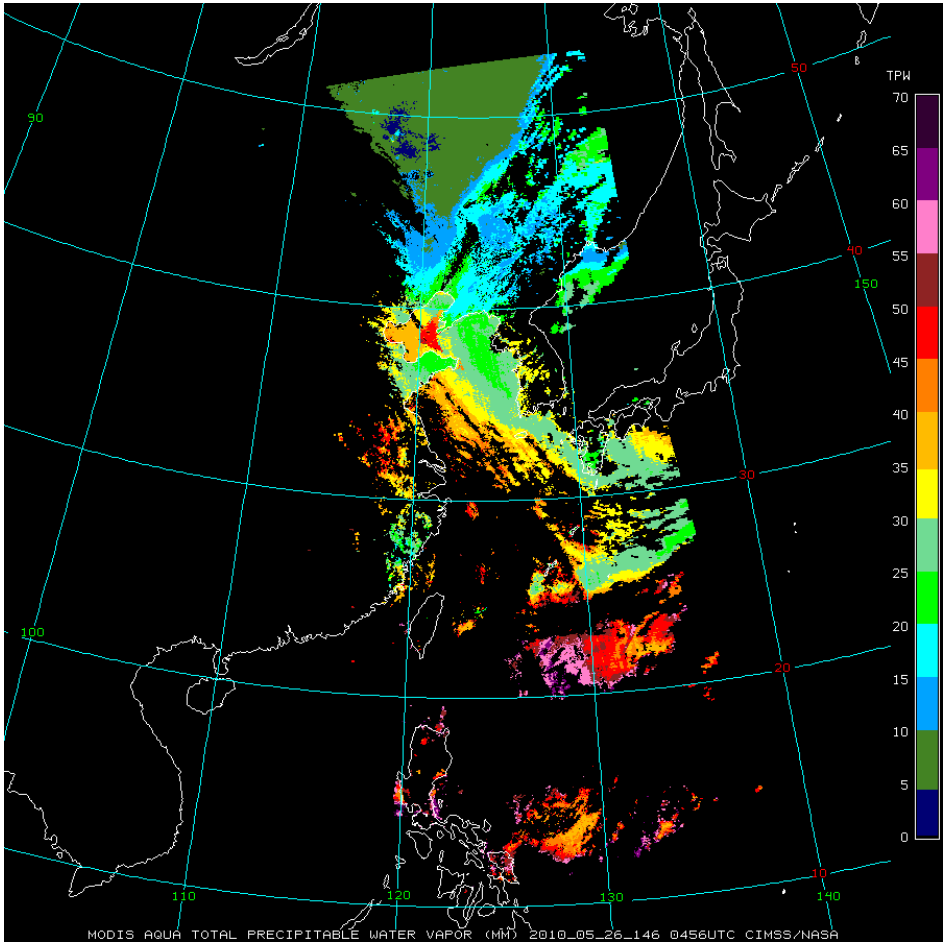
MODIS Atmosphere Products

2010/05/26 04:56

Cloud Mask



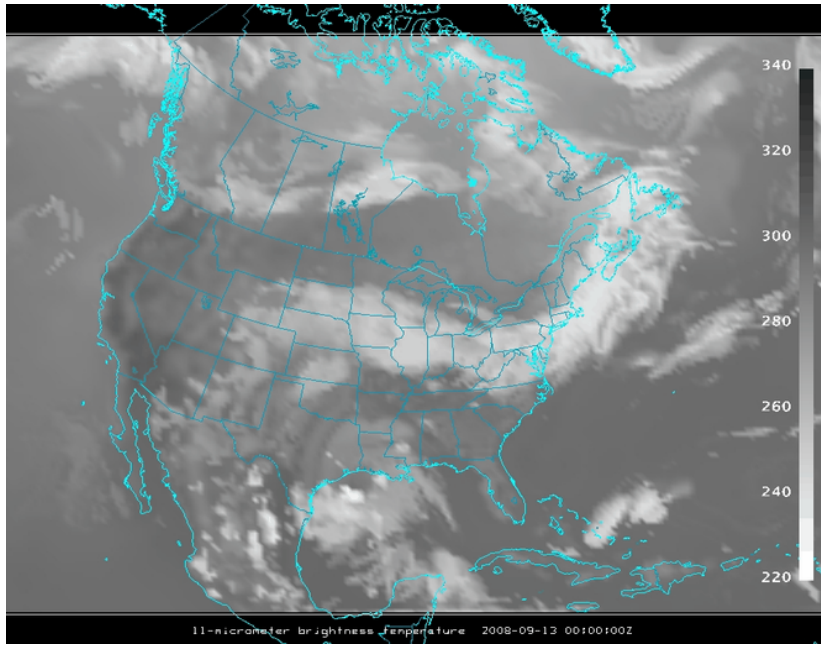
Water Vapor



DBCRAS NWP Model

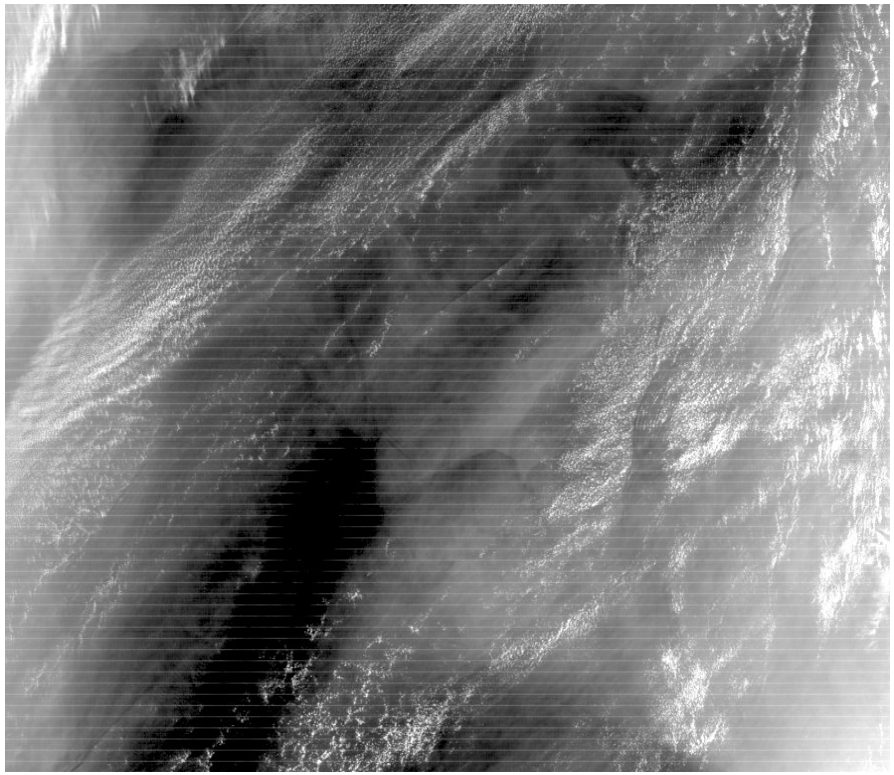
- Easy to install and easy to execute on modest PCs
- NWP domain centered on your DB location
- Assimilates IMAPP MOD07 TPW and MOD06CT Cloud Top Pressure and Cloud Effective Emissivity in order to adjust the cloud and moisture fields in the GFS.
- Output is standard meteorological parameters in GRIB2
- Creates forecast satellite imagery

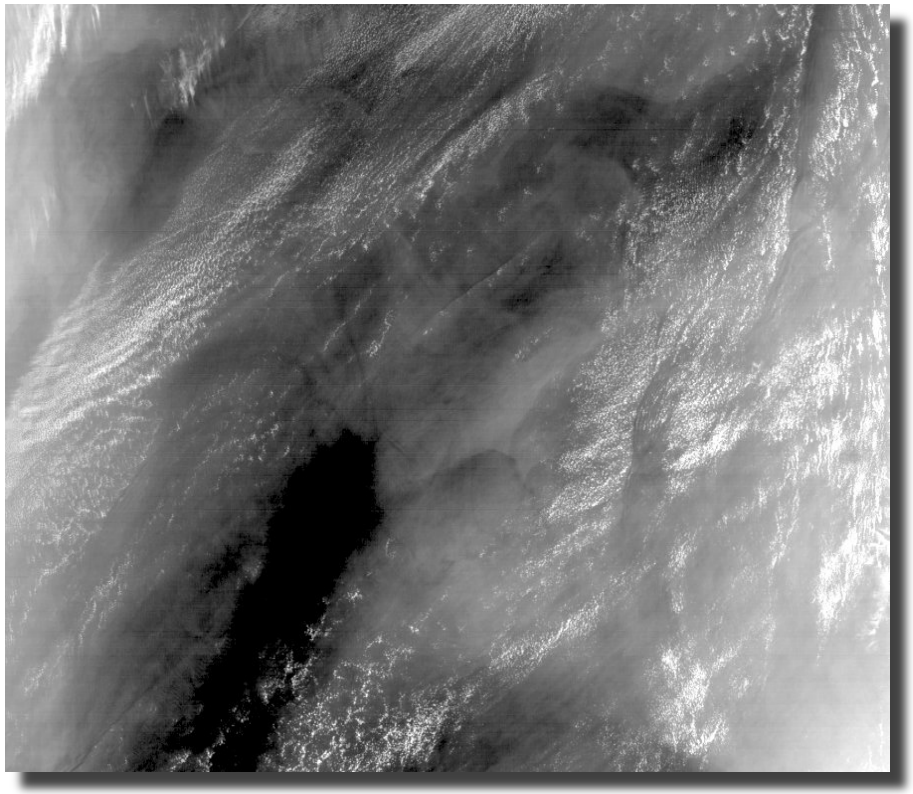
72 hour forecast of 11 micron brightness temperature (3 hour time step)



Level 1B 1KM Destriping

- Removes stripes from 1KM thermal infrared bands
- Each detector is adjusted to match a reference detector
- Destriping is recommended before creating IMAPP Atmosphere Products (e.g., Cloud Mask)





Terra MODIS L1B 1KM, 2003094 06:05, Band 29

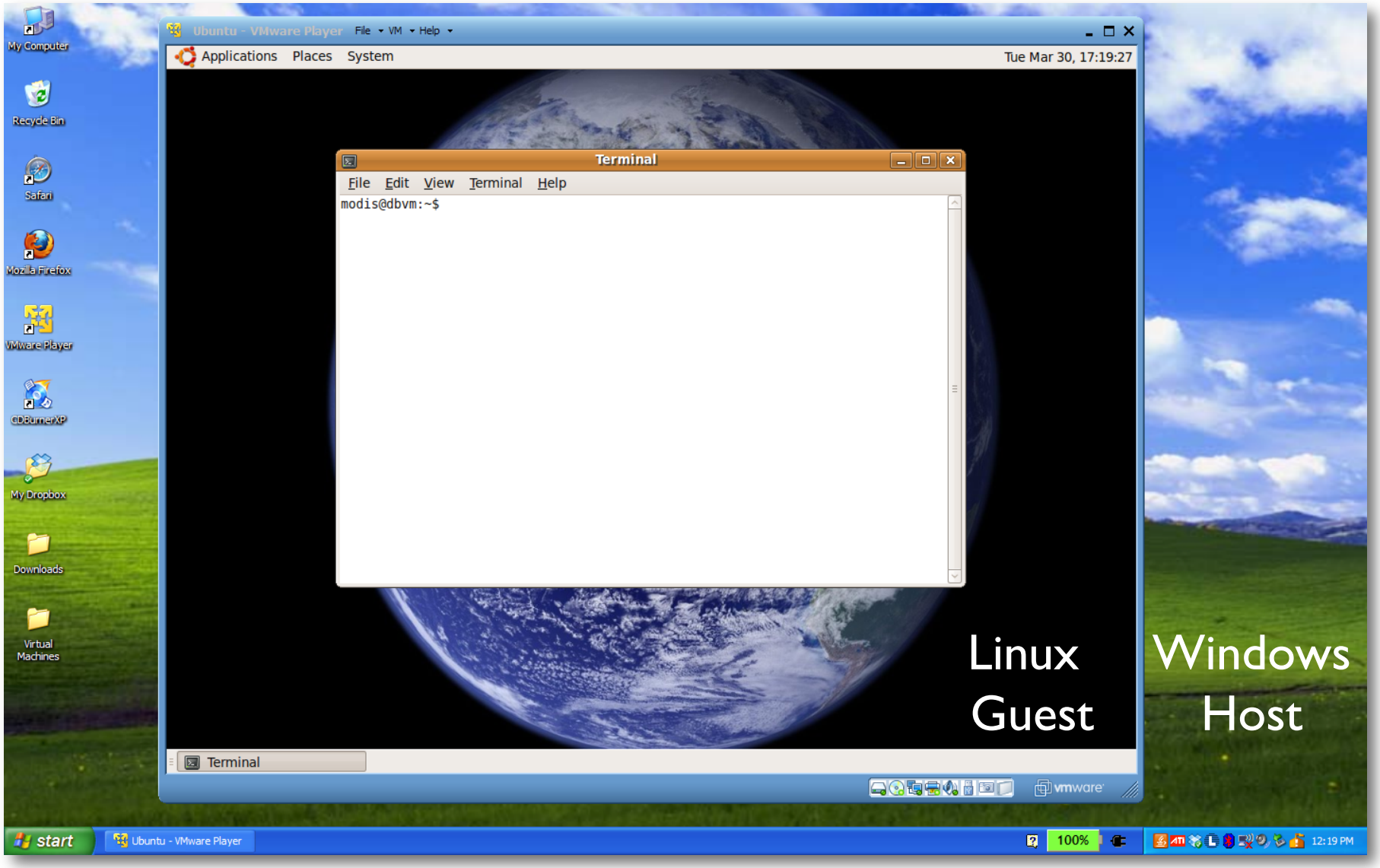
True Color Images for Google Earth

Images can be ready within 30 minutes of acquisition

IMAPP Virtual Appliance

The IMAPP VA makes it simple to install and run a DB processing system to create a range of atmosphere, land, and ocean products from the MODIS sensor onboard Terra and Aqua, and the AIRS, AMSU, and AMSR-E sensors onboard Aqua.

- Supports Windows (XP, Vista, 7), Apple OS X, Linux
- Install and run within 10 minutes
- Easy to configure (e.g., turn on MODIS Land, turn off AIRS)
- Easy to maintain (automated lookup table updates)
- Designed for simplicity (no DBMS, no Java, no COTS; just Bash scripts)
- Allow reliable automated processing
- Use only open source software packages (e.g., IMAPP, SeaDAS, etc.)
- Software package downloads are automated as part of the install process
- Easy to add user-created processing software


My Computer
Recycle Bin
Safari
Mozilla Firefox
VMware Player
CDBurnerXP
My Dropbox
Downloads
Virtual Machines
Ubuntu - VMware Player
File
VM
Help
Applications
Places
System
Tue Mar 30, 17:19:27
Terminal
File
Edit
View
Terminal
Help
modis@dbvm:~$
Terminal
vmware
Linux Guest
Windows Host
start
Ubuntu - VMware Player
100%
12:19 PM

IMAPP VA Installation (Windows)

1. Download and run IMAPP VA self-extracting archive
2. Download and install VMware Player (free)
3. Start VMware Player and select IMAPP VA

MODIS Level 1 and Atmosphere processing packages are pre-installed.

Other packages can be added by editing a configuration file, and running an installer script.

Version 1.1 is now available on the IMAPP website

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MODIS DB Land Products

Software: **Science Processing Algorithms (SPA)**

Developers: MODIS Science Team

Distributor: NASA Direct Readout Laboratory

Platforms: Linux, Windows (VM)

Website: http://directreadout.sci.gsfc.nasa.gov/

Free Download

DRL Software/Algorithms

DOWNLOADS

- TECHNOLOGY

+ DATA

+ NEW USER

+ DOWNLOAD GUIDELINES

DRL Highlights

L2GEN_SPA V5.9.7 Released
H2G_SPA V1.5a Released
CRECBuilder V1.0 Released
IMAPP_SPA V2.0
L2GEN_SPA V5.8.9
Simulcast V4.1 Released
MODLST_SPA V4.14
L2GEN_SPA V5.8.3
MOD09_SPA V5.3.18
MODISL1DB_SPA V1.5
IPOPP Alpha Test Program
GBAD_SPA V2.6 Released
RT-STPS V4.1 Released
CREFL_SPA V1.4.2
Simulcast V4.0 Released
IMAPP_SPA V2.0 Released
RT-STPS V4.0 Released
MSL12_SPA V5.7.1
MODISL1DB_SPA V1.4
MODIS Product Gallery
NDVIEVI_SPA V2.2
MOD14_SPA V5.0.1
MODLST_SPA V4.13
MODISL1DB_SPA V1.3

Category	Software Name	Description	Platform	Version
Level 1 (GEO/CAL)	AIRS	AIRS processes downlinked data from the AIRS, AMSU-A and HSB instruments on the Aqua spacecraft from RAW packets in PDS format to Level 1-B calibrated radiances.	Linux, Sun	5.2
Protocol Processing / Level 0	Construction Record Lister	Prints the contents of a PDS/EDS Construction Record.	Linux, Windows	1.01
Utilities	CRECBuilder	The CRECBuilder utility is a Java application that reads a MODIS Level-0 packet file and recreates the corresponding Production Data Set (PDS) (packet file + construction record/metadata file).	Linux	1.0
Level 2	CREFL_SPA	The crefl_SPA processes MODIS Aqua and Terra Level 1B DB data into the MODIS Level 2 Corrected Reflectance product. The algorithm performs atmospheric correction with MODIS visible and near-infrared bands (bands 1 - 7), and it also corrects for molecular scattering and gaseous absorption.	Linux	1.4.2
Protocol Processing / Level 0	GBAD_SPA	The Aqua GBAD Ephemeris and Attitude Data Converter (GBAD) SPA creates ephemeris and attitude files.	Linux	2.6
		The H2G_SPA is specially designed for		

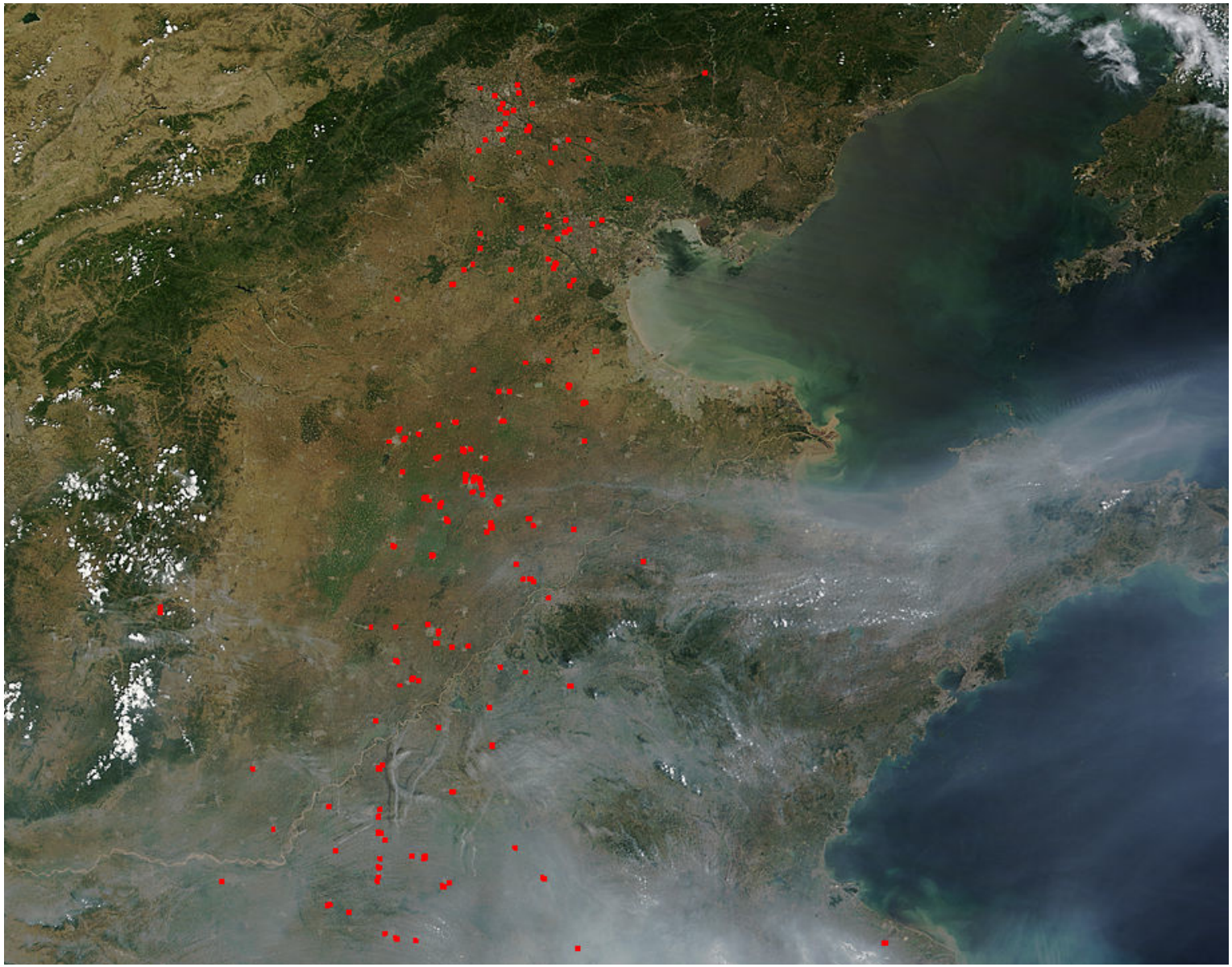
What does SPA do?

Purpose: **Creates DB customized Land products**

Input Data: **MODIS Level 1B 1KM, HKM, QKM, and Geolocation (HDF4 format)**

Output Data: **MODIS Level 2 Active Fires, Corrected Reflectance, NDVI, EVI, Land Surface Temperature, Land Surface Reflectance (HDF4 format)**

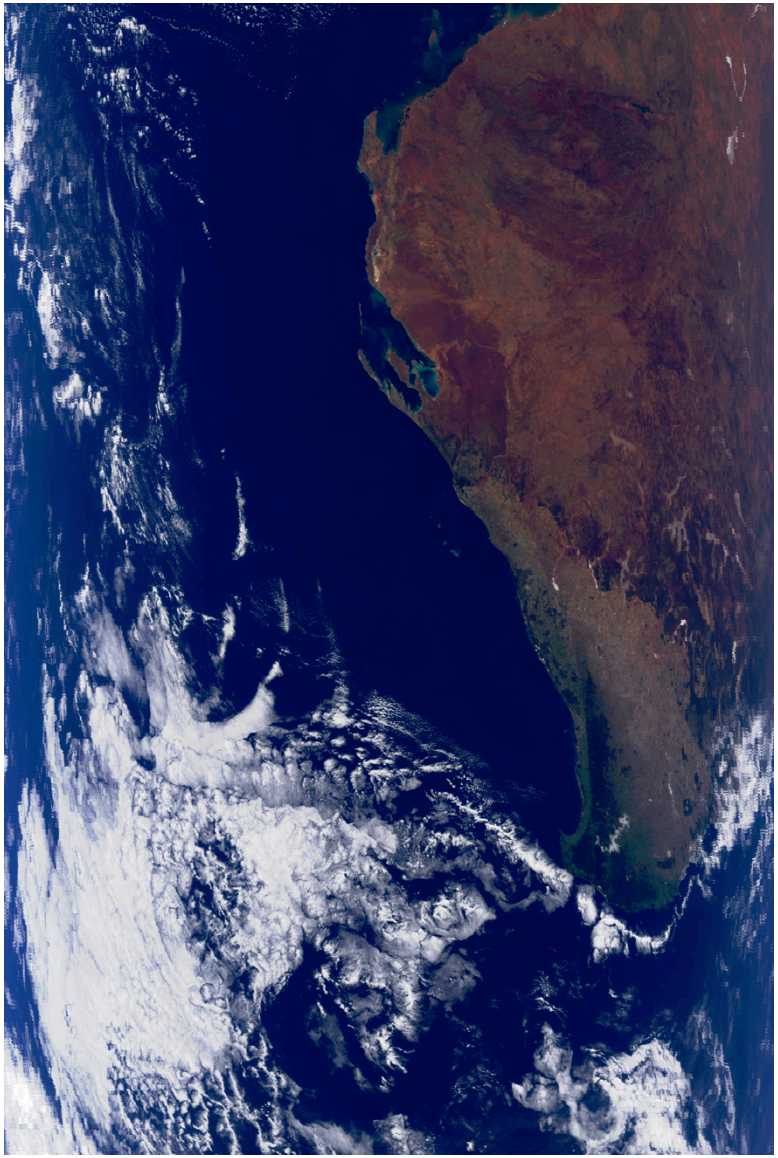
Active Fires



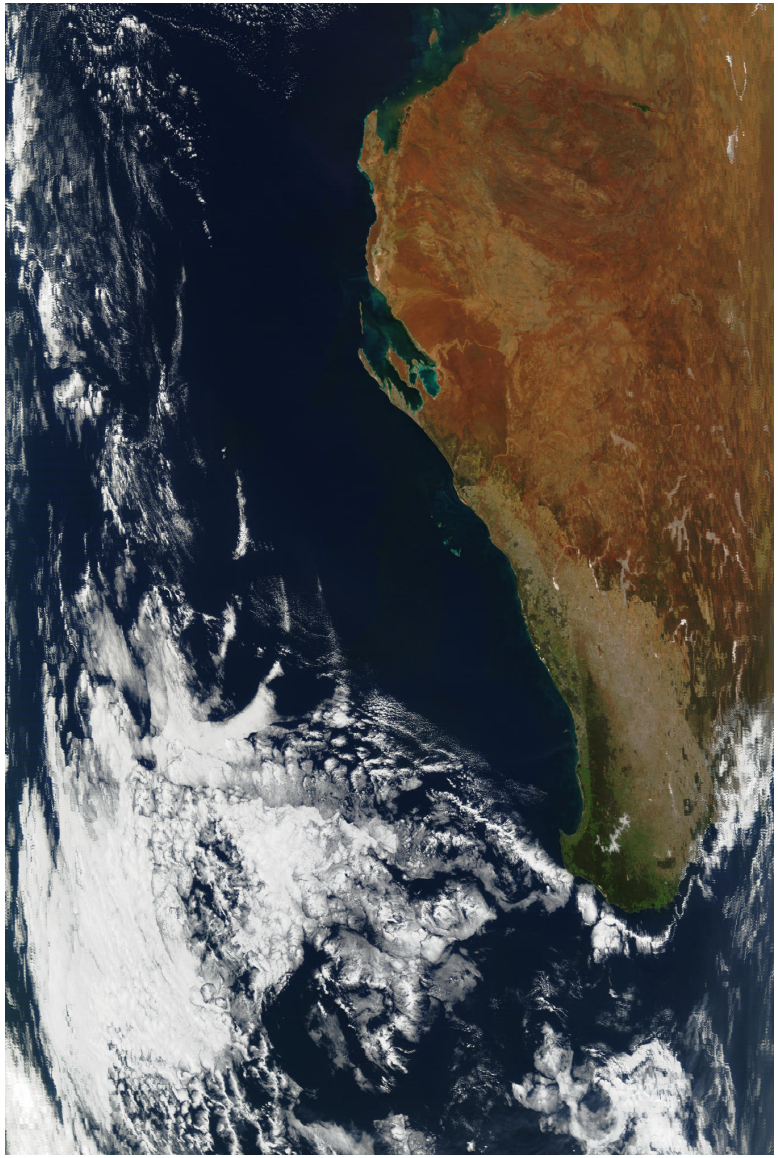
2010/07/06 Terra MODIS

MODIS Corrected Reflectance

Before



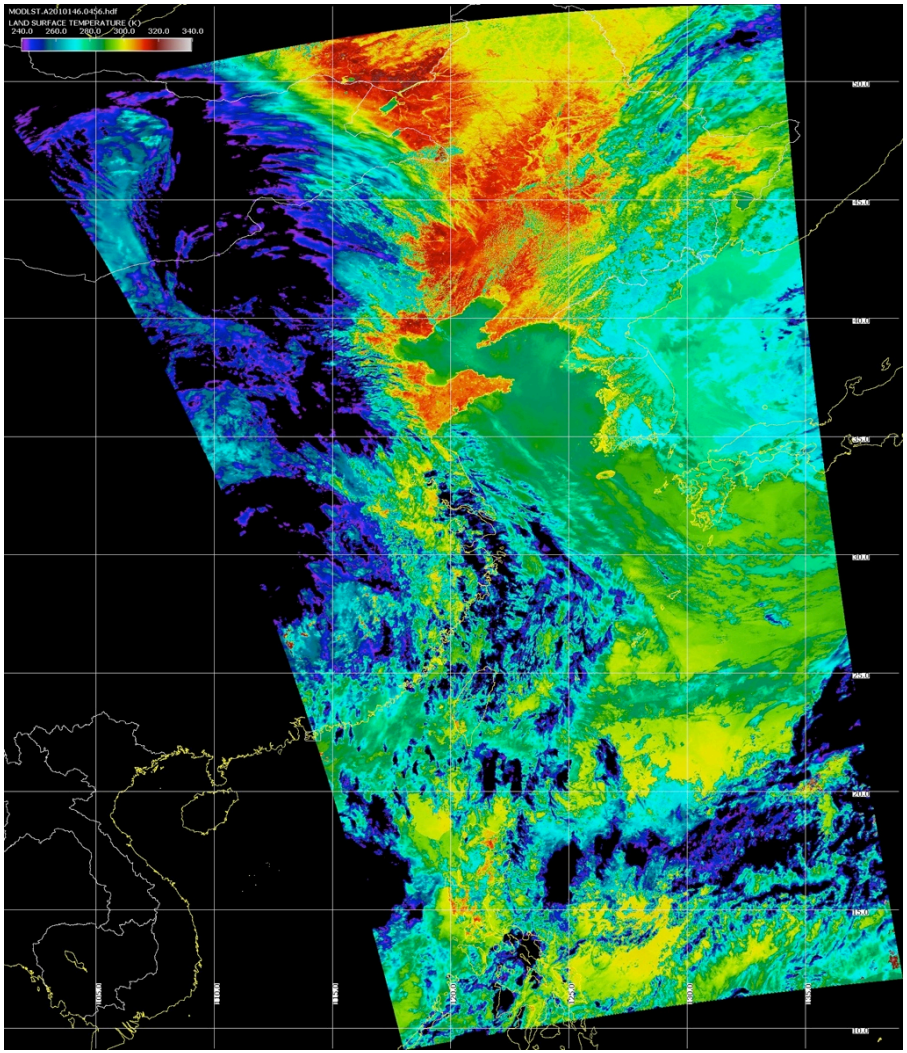
After



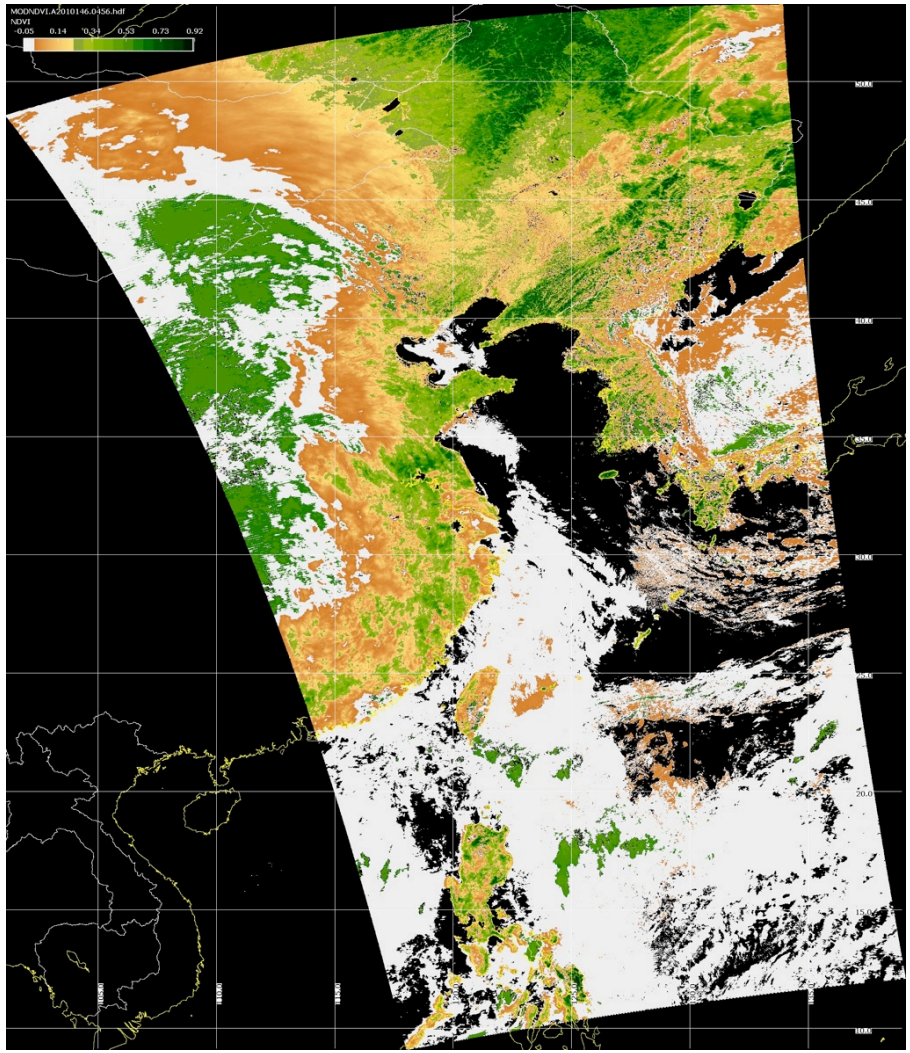
MODIS Land Products

Aqua MODIS 2010/05/26 04:56

Land Surface Temperature



Vegetation Index

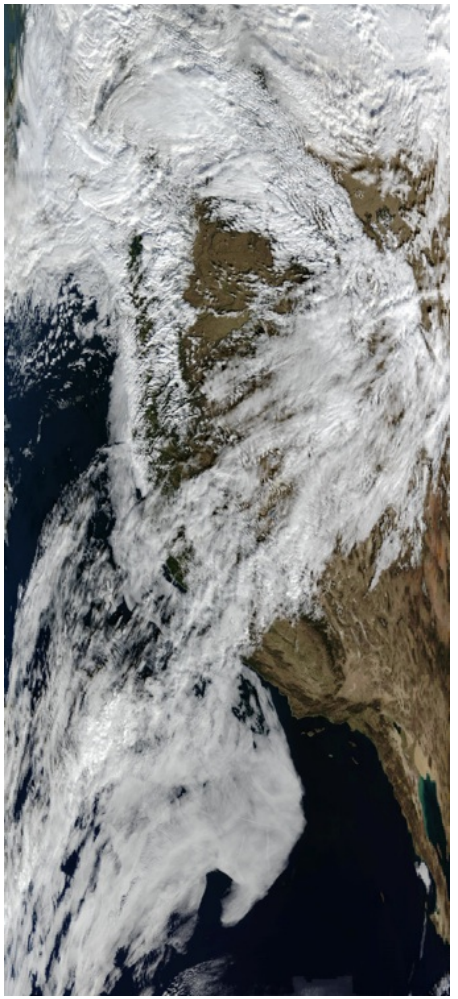


Land Surface Reflectance

MODIS Land Surface Reflectance Algorithm (MOD09) code was adapted for DB by Eric Vermote and Jim Ray. Standard HDF4 format with metadata is created.

Changes for DB included:

- Code pre-compiled for 32-bit Intel Linux; source code is also available
- Handles arbitrary granule sizes
- Able to use NCEP GFS forecast data instead of NCEP GDAS analysis data
- Automatically discovers and downloads required ancillary data at runtime
- Handles bad geolocation data
- Night granules are handled gracefully in wrapper script

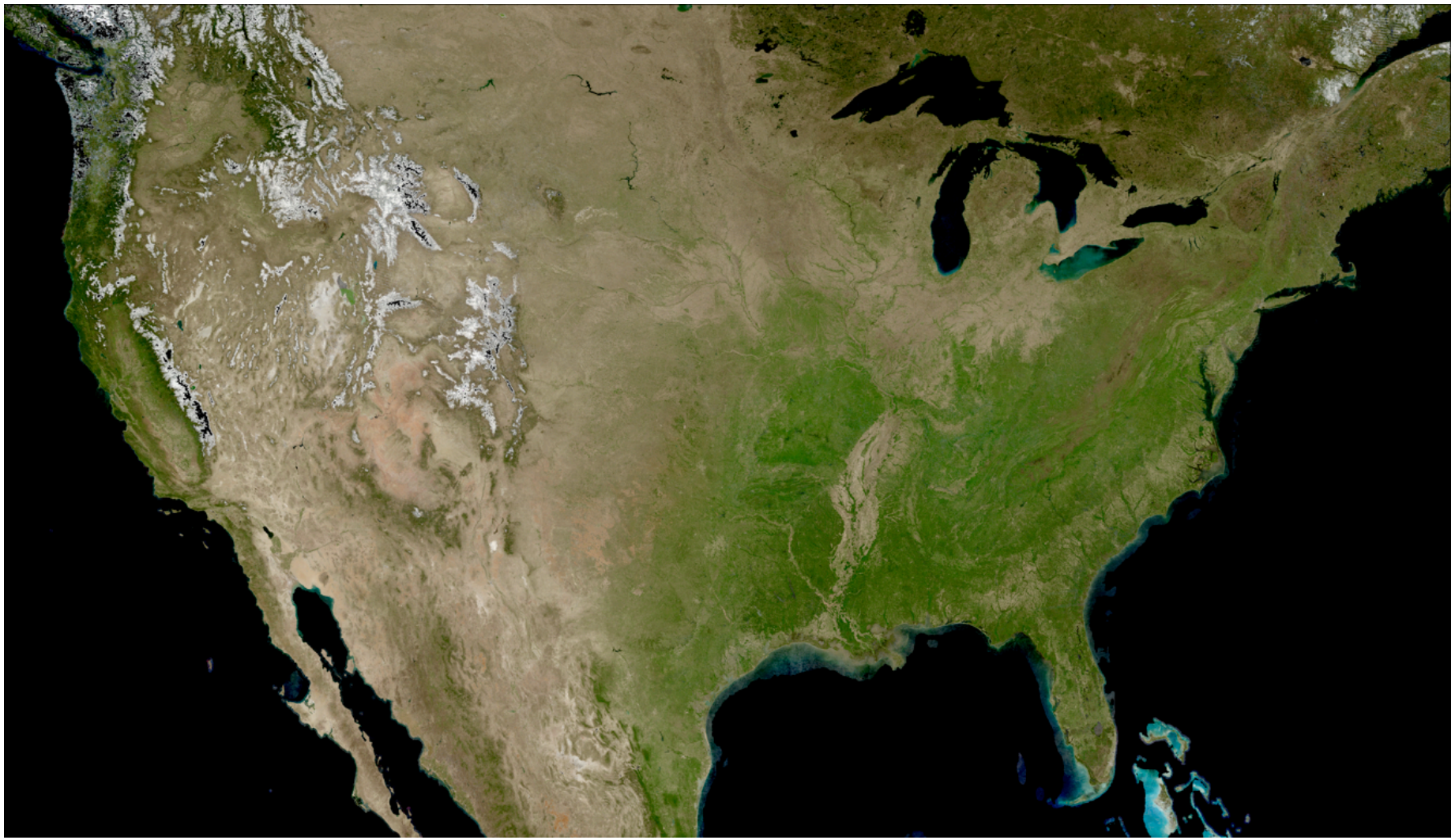


MOD09 True Color
Aqua DB

MODIS NBAR

- MOD43B4 Nadir BRDF-Adjusted Reflectance (NBAR) Product is computed for MODIS spectral bands (1-7) at the mean solar zenith angle of each 16 day period.
- View angle effects are removed from the directional reflectances.
- Applications include vegetation indices, land cover change, and burned area mapping.

16-day Composite from DB NBAR Algorithm (True Color) visualized by HDFLook



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MODIS DB Ocean Products

Software: **SeaDAS**

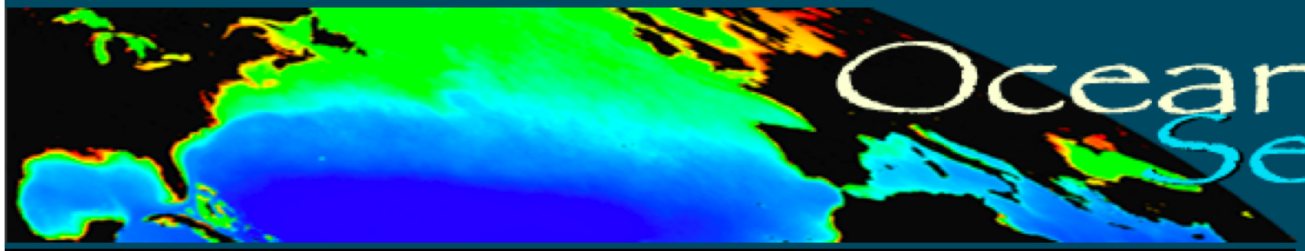
Developers: NASA Ocean Biology Processing Group, MODIS Science Team

Distributor: NASA Ocean Biology Processing Group

Platforms: Linux, OS X, Windows (VM)

Website: http://oceancolor.gsfc.nasa.gov/seadas/

Free Download



SeaDAS Web

Support

Ocean Color Web
Ocean Color Forum
Ocean Mailing Lists

Download and Installation

Linux and Mac:

- Online Auto-Installation
- Manual Download
- Manual Installation

Windows:

- SeaDAS Virtual Appliance

Satellite Data Info

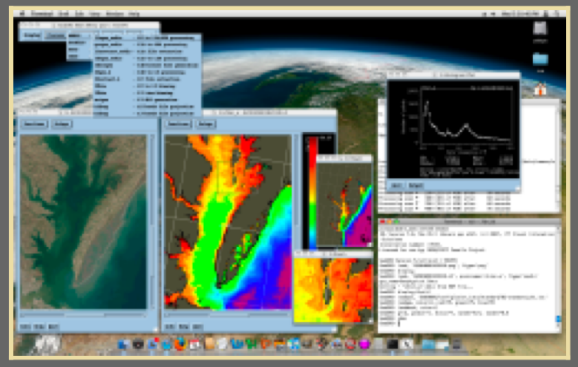
Data Product Specifications
Data Format Specifications
Processing Versions Chart

Satellite Data Access

Level 1 and 2 Browser

What is SeaDAS

The SeaWiFS Data Analysis System (SeaDAS) is a comprehensive image analysis package for the processing, display, analysis, and quality control of ocean color data.



Supported satellite sensors are MODIS, SeaWiFS, OCTS, and CZCS.

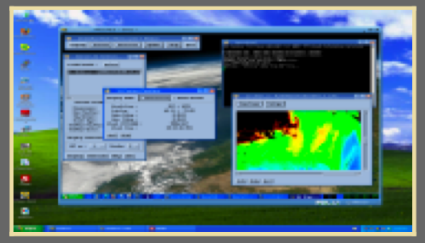
- Features
- Requirements
- Online Help
- SeaDAS FAQ
- User Contributed Software

What's New

SeaDAS Virtual Appliance released for Windows!

SeaDAS VA 5.4 allows SeaDAS to be run on Microsoft Windows XP and Vista systems within a virtual Linux machine.
This is a fully functional version of SeaDAS and processing benchmarks show very impressive performance.

SeaDAS VA is simple to install and requires the free VMware Player.



User Contributed Software

Do you have programs to share?

What does SeaDAS do?

Purpose: **Creates standard ocean color and ocean temperature products. Allows interactive display and analysis of ocean products.**

Input Data: **MODIS Level 1B 1KM, HKM, QKM, and Geolocation (HDF4 format)**

Output Data: **MODIS Level 2 Water Leaving Radiance, Chlorophyll concentration, Sea Surface Temperature (HDF4 format)**

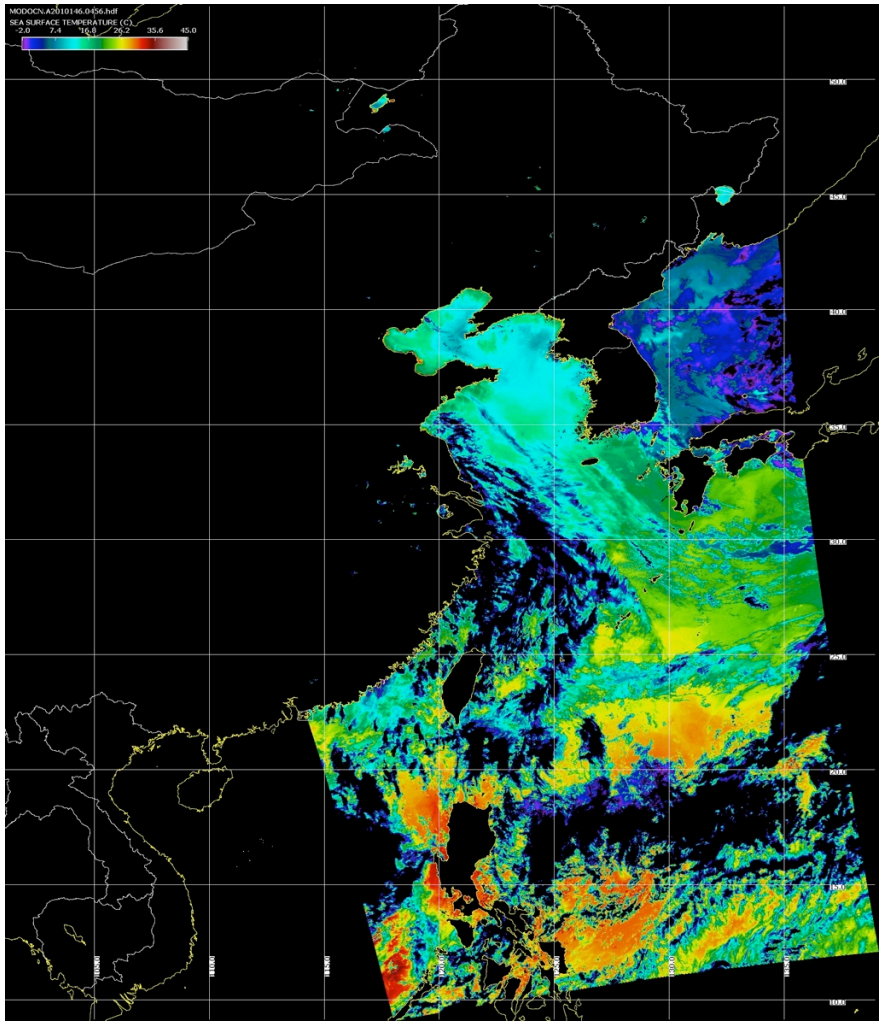
SeaDAS Standard Products

Geophysical Parameter Name	Description
nLw_412	Normalized water-leaving radiance at 412 nm
nLw 443	Normalized water-leaving radiance at 443 nm
nLw_488	Normalized water-leaving radiance at 488 nm
nLw_531	Normalized water-leaving radiance at 531 nm
nLw_551	Normalized water-leaving radiance at 551 nm
nLw_667	Normalized water-leaving radiance at 667 nm
Tau_869	Aerosol optical thickness at 869 nm
Eps_78	Epsilon of aerosol correction at 748 and 869 nm
Chlor_a	OC3 Chlorophyll a concentration
K490	Diffuse attenuation coefficient at 490nm
Angstrom_531	Angstrom coefficient, 531-869 nm
SST	Sea Surface Temperature: 11 micron
SST4	Sea Surface Temperature: 4 micron (night only)

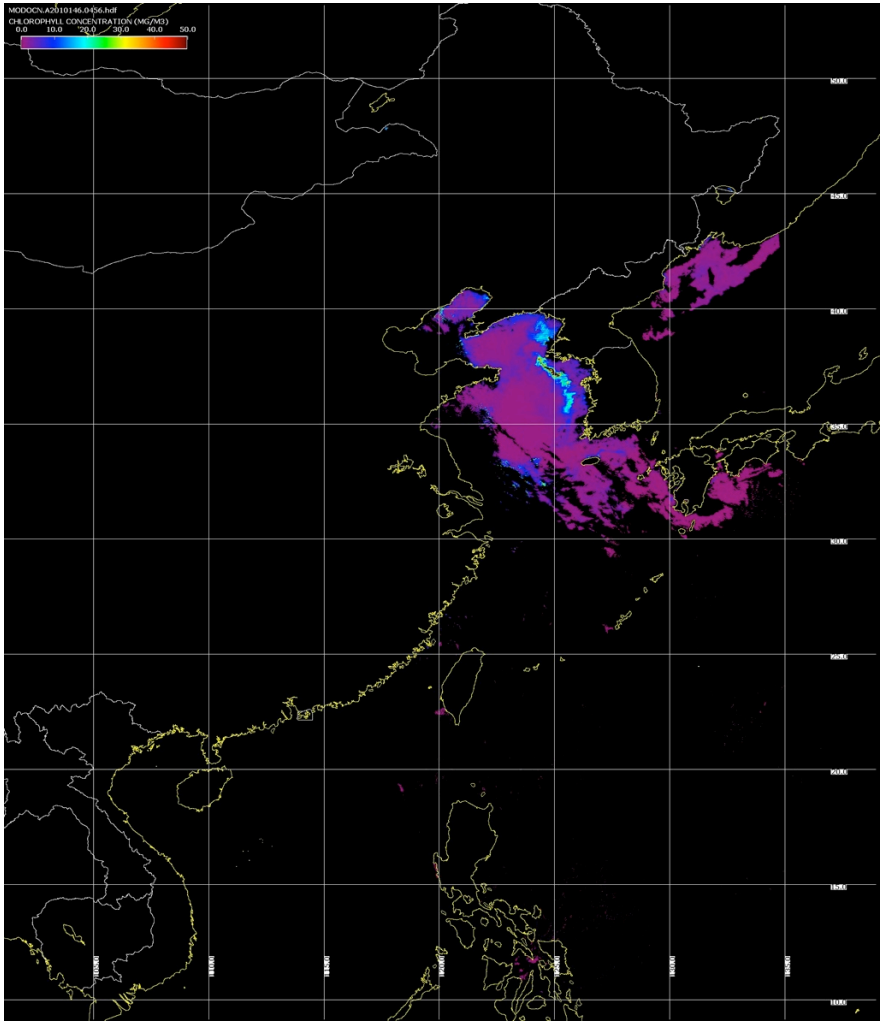
SeaDAS MODIS Products

Aqua MODIS 2010/05/26 04:56

Sea Surface Temperature



Chlorophyll-A



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Software for Interpreting DB Products

- MODIS products are stored in a specialized format named Hierarchical Data Format (HDF) version 4.
- Some of the MODIS products (e.g., Level 1B) have complex internal structures
- Specialized software is required to read and interpret the HDF4 format correctly
- Software is designed for (a) Interactive Display, (b) Quantitative Analysis, or (c) Both
- Software is either (a) Free; or (b) Expensive

Software from Univ. of Wisconsin

- **Hydra** is a free application for MODIS, AIRS, and SEVIRI data exploration in classroom settings
- **Mc-LITE** is a free application for automated generation of MODIS image products (available as an add-on to IMAPP)
- **McIDAS-V** is a free application for interactively exploring MODIS and many other satellite and meteorological data products

http://www.ssec.wisc.edu/

Free Software

- **MRTSwath** is a Linux application for reprojecting MODIS Level 1B and Level 2 products to a map grid (removes bowtie artifacts)
- **HDFLook** is a Linux application for interactive and automated display and reprojection of MODIS Level 1B and Level 2 products
- **MS2GT** is a Linux application for reprojecting MODIS Level 1B data and any other satellite imager data (AVHRR, MERSI, VIIRS)

Just Google the names…

Commercial Software

- **ENVI** is a Windows/Linux/OSX application interactive display and analysis of many satellite products, including MODIS Level 1B and Level 2
- **IDL and Matlab** are Windows/Linux/OSX interactive programming environments for quantitative analysis, and they can read MODIS Level 1B and Level 2 products in HDF4 format

Just Google the names…

HDF4 Application Programming Interface (API)

- The HDF4 API is available for C, C++, FORTRAN-90, Java, and Python
- Documentation, binaries, and source code are available

http://www.hdfgroup.org/

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SNPP, Aqua, and Terra DB Products from HCC Antenna

The HCC antenna provides real-time VIIRS, CrIS, ATMS, MODIS, AIRS, and AMSU products (Level 0 through Level 2) for the last 30 days at

http://soest-hcc1.hcc.hawaii.edu/

All data collected at HCC is available on this site!

MODIS Products from NASA

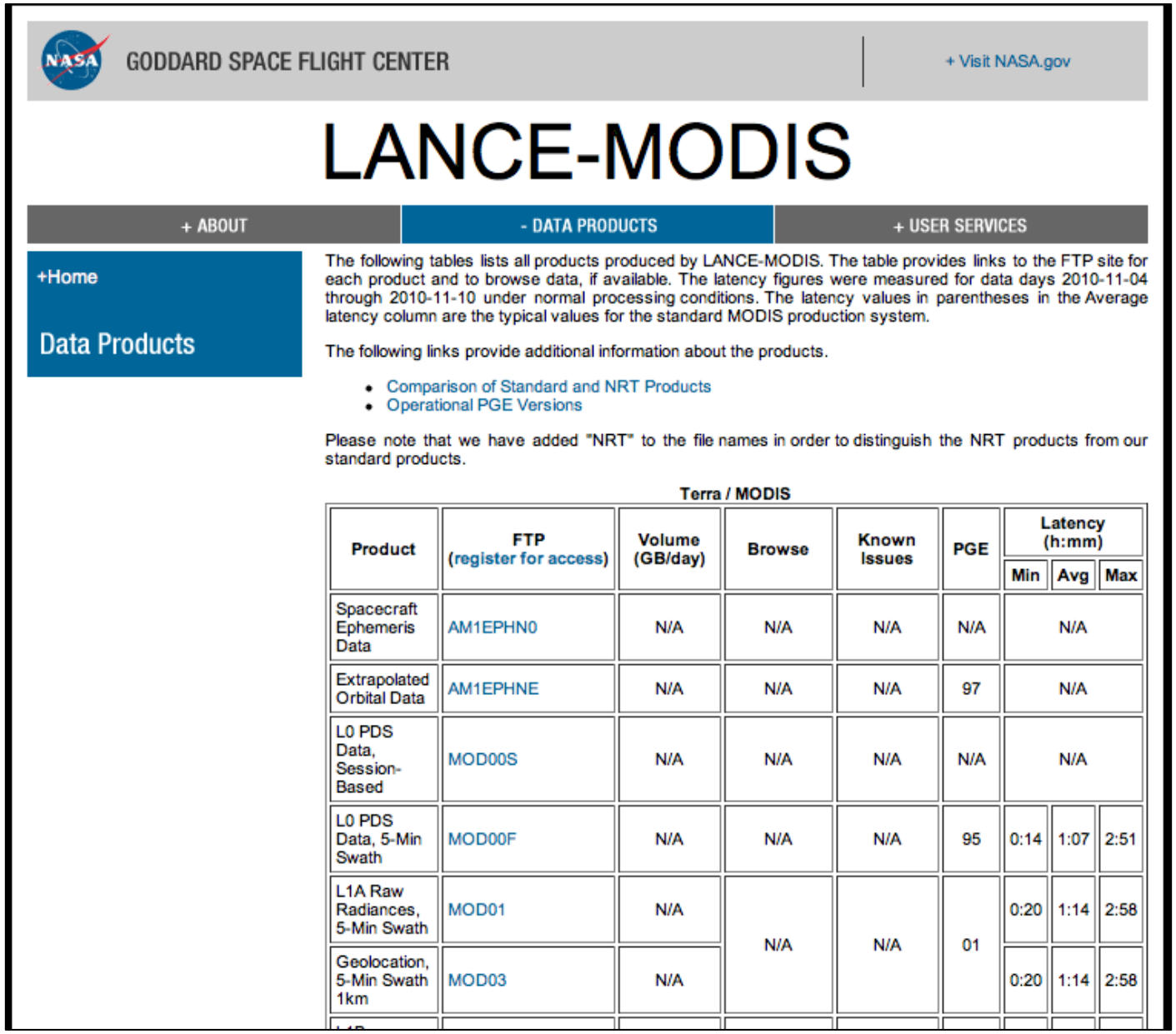
NASA provides MODIS Level 0, Level 1B, Land, Ocean and Atmosphere Products at no cost

Global near real-time products (about 90-120 minutes delay) are available from LANCE

Best for obtaining products in real-time; regional subscriptions are available.

Global long-term archive products (about 24 hours delay) are available from LAADS

Best for obtaining long-term historical data.



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LANCE-MODIS

+ ABOUT | - DATA PRODUCTS | + USER SERVICES

+Home

Data Products

The following tables lists all products produced by LANCE-MODIS. The table provides links to the FTP site for each product and to browse data, if available. The latency figures were measured for data days 2010-11-04 through 2010-11-10 under normal processing conditions. The latency values in parentheses in the Average latency column are the typical values for the standard MODIS production system.

The following links provide additional information about the products.

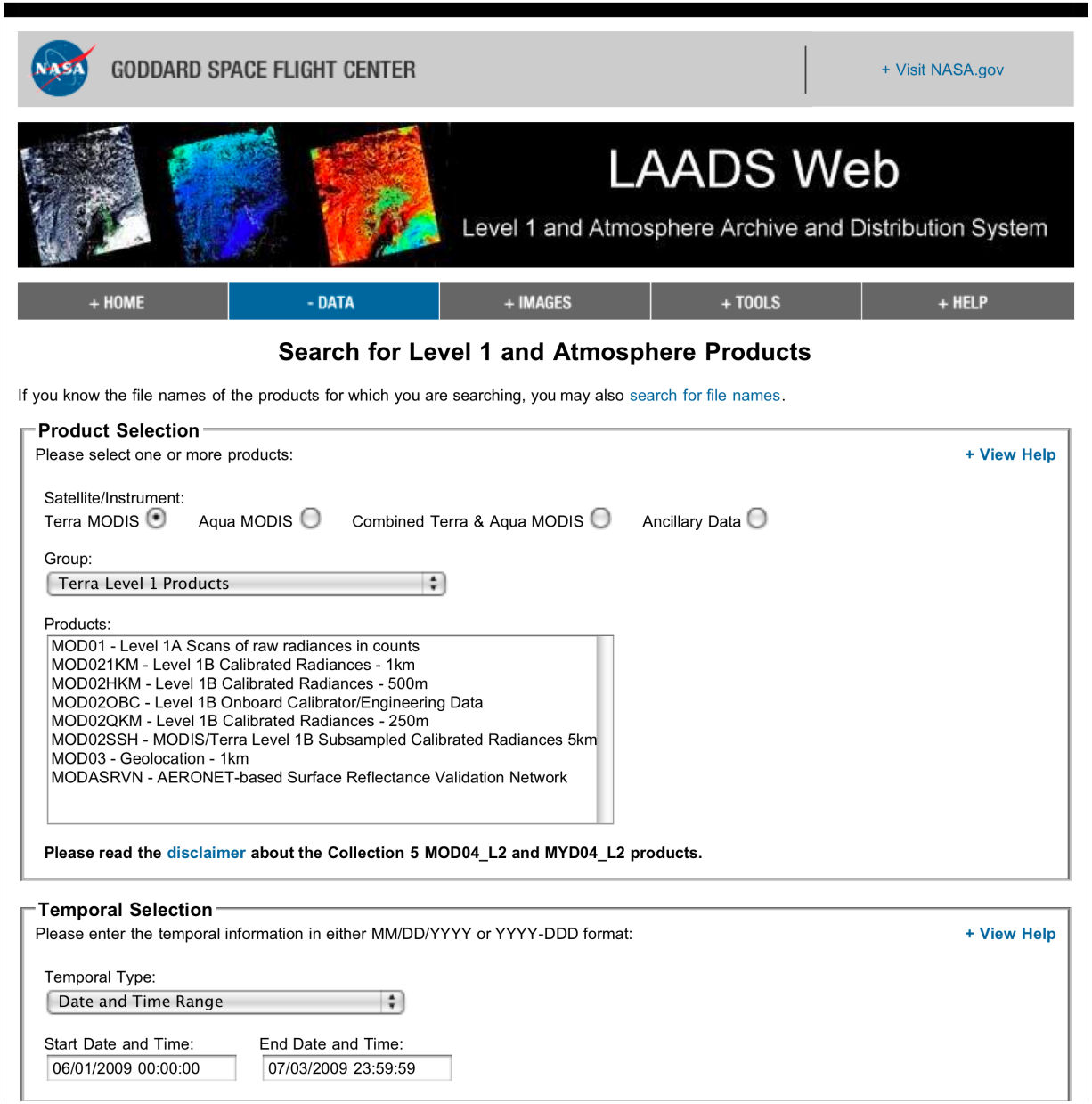
- Comparison of Standard and NRT Products
- Operational PGE Versions

Please note that we have added "NRT" to the file names in order to distinguish the NRT products from our standard products.

Terra / MODIS

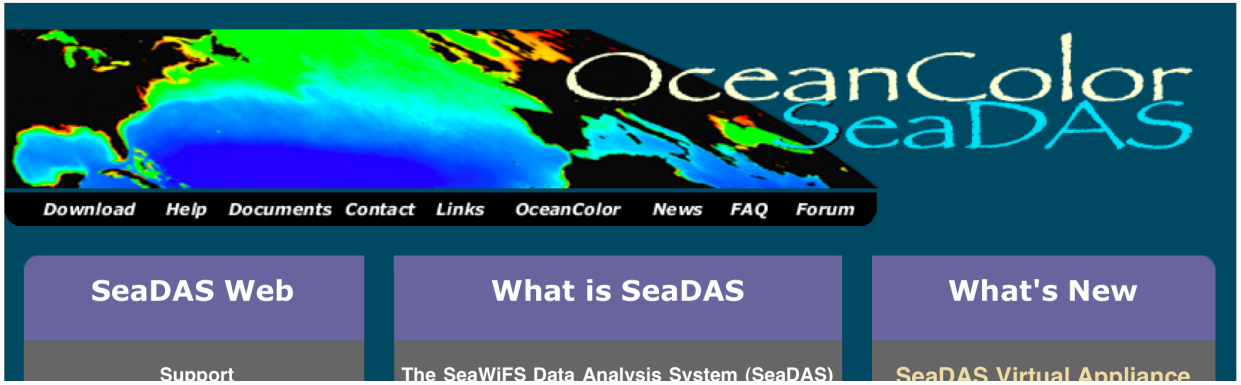
Product	FTP (register for access)	Volume (GB/day)	Browse	Known Issues	PGE	Latency (h:mm)		
						Min	Avg	Max
Spacecraft Ephemeris Data	AM1EPHN0	N/A	N/A	N/A	N/A	N/A		
Extrapolated Orbital Data	AM1EPHNE	N/A	N/A	N/A	97	N/A		
L0 PDS Data, Session-Based	MOD00S	N/A	N/A	N/A	N/A	N/A		
L0 PDS Data, 5-Min Swath	MOD00F	N/A	N/A	N/A	95	0:14	1:07	2:51
L1A Raw Radiances, 5-Min Swath	MOD01	N/A	N/A	N/A	01	0:20	1:14	2:58
Geolocation, 5-Min Swath 1km	MOD03	N/A				0:20	1:14	2:58

http://lance-modis.eosdis.nasa.gov/data_products/



http://ladsweb.nascom.nasa.gov/data/search.html

MODIS Ocean Level 2 Products are available from http://oceancolor.gsfc.nasa.gov/



MODIS Land Level 2/3 Products are available from http://lpdaac.usgs.gov/