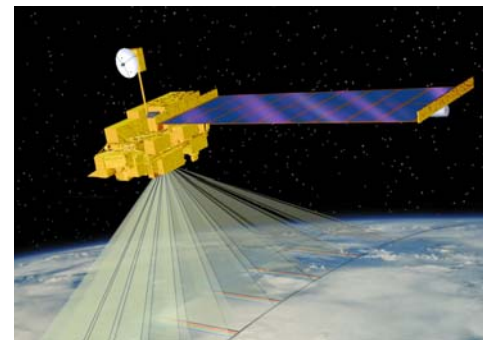




MODIS Direct Broadcast: Products and Software

IGARSS 2009 SC-4
Stellenbosch, South Africa
July 7-10, 2009

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



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

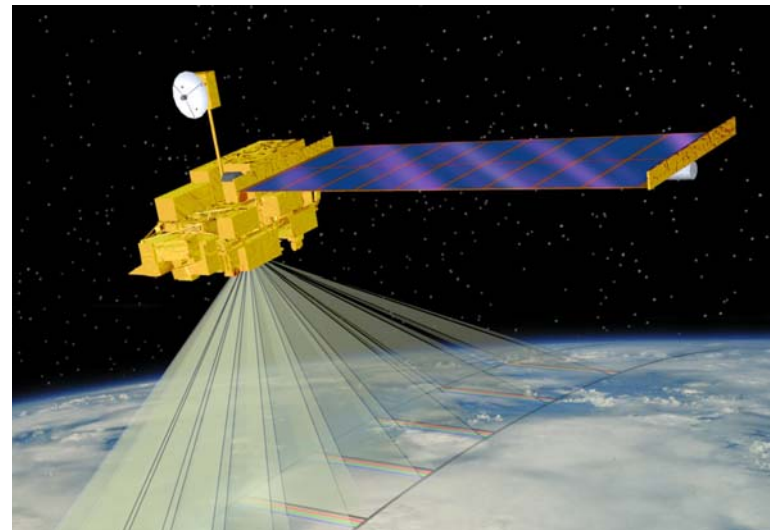
Launched: Dec. 18, 1999

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
- In South Africa, CSIR operates two antennas at SAC and Meraka Institute
- Data from CSIR is freely available at <http://afis.meraka.org.za/wamis/catalogue/level-0/>
- There are several other stations in Africa, but access to data is uncertain

There are other ways to get MODIS data...

□ □

Beijing



Moscow

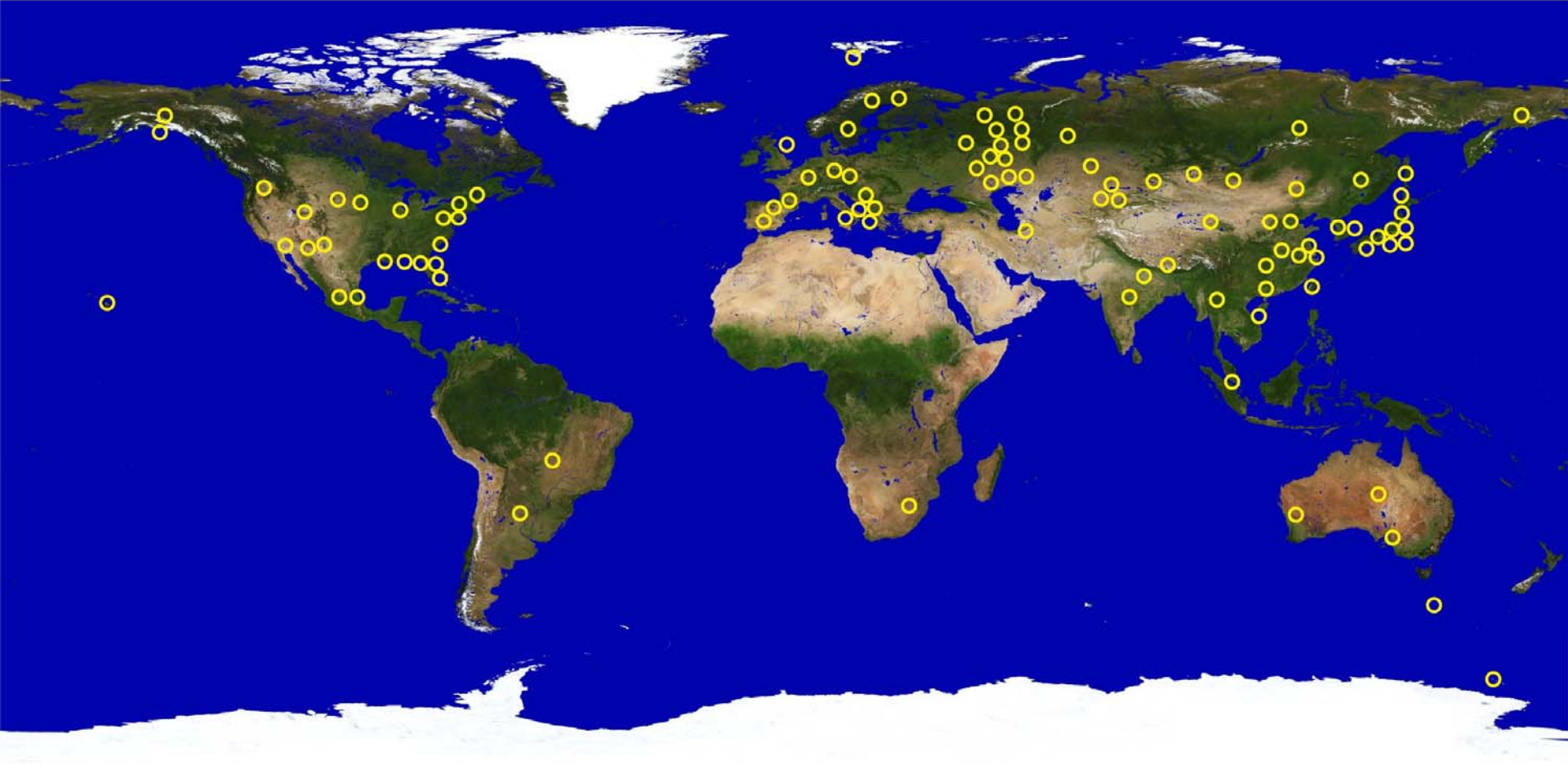


Madison



Benevento

EOS Direct Broadcast Sites Worldwide

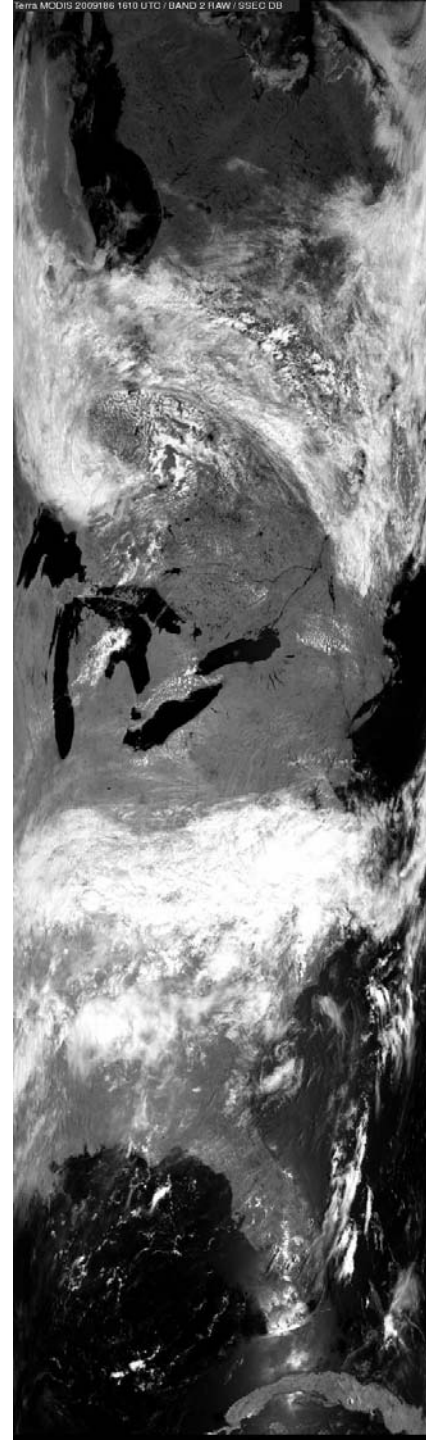


July 2007

DB Coverage from Madison, WI

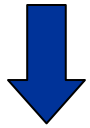
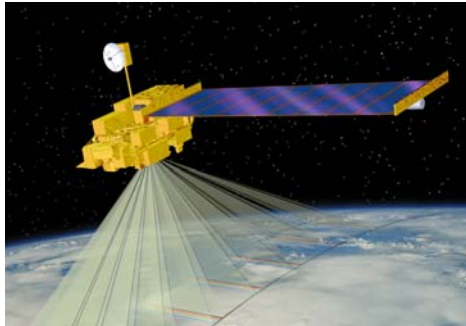


Terra, 2009/07/05

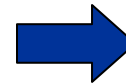
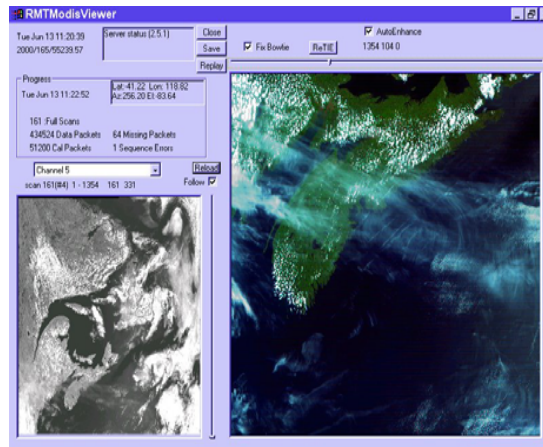
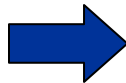


Advantages of DB

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

Processing Software

Products and Applications

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MODIS DB Image Products

Software: **MODISL1DB**

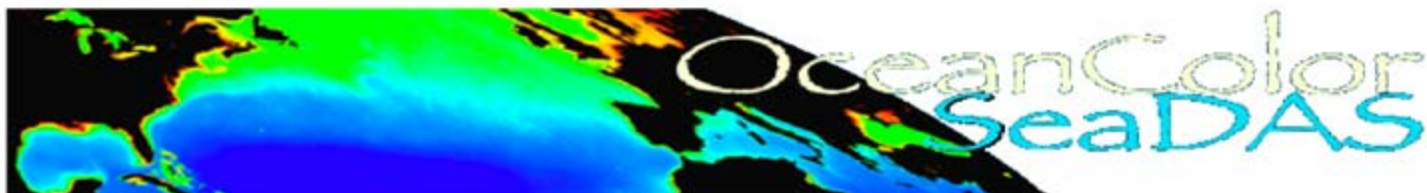
Developers: MODIS Characterization Support Team, MODIS Science Team, NASA Ocean Biology Processing Group

Distributor: NASA Ocean Biology Processing Group

Platforms: Linux, OS X, Windows (VM)

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

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MODISL1DB 1.5 (Released March 31, 2008)

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, as outlined in the SeaDAS Processing Version Chart.

IMPORTANT: MODISL1DB version 1.5 contains no processing code changes, but many of the Unix binaries have been renamed for standardization purposes (and to stay in sync with SeaDAS). This will NOT affect most users, since the wrapper processing scripts have not been renamed and these scripts are all that is needed to carry out the processing. Also note that some new platforms are supported, and all Linux processing binaries are now statically linked which may allow users to run MODISL1DB on a wider variety of unsupported Linux systems. See the version history for more details.

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@seadas.gsfc.nasa.gov.

Supported platforms

- Ubuntu Linux 7.10 (kernel 2.6.22)
- RedHat Linux Fedora Core 6 (kernel 2.6.20)
- RedHat Linux Fedora Core 4 (kernel 2.6.11)
- CentOS Linux 4.4 (kernel 2.6.9)
- Intel Macintosh OS X 10.4 and 10.5
- PowerPC Macintosh OS X 10.4 and 10.5
- Solaris 8 (SunOS 5.8)

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

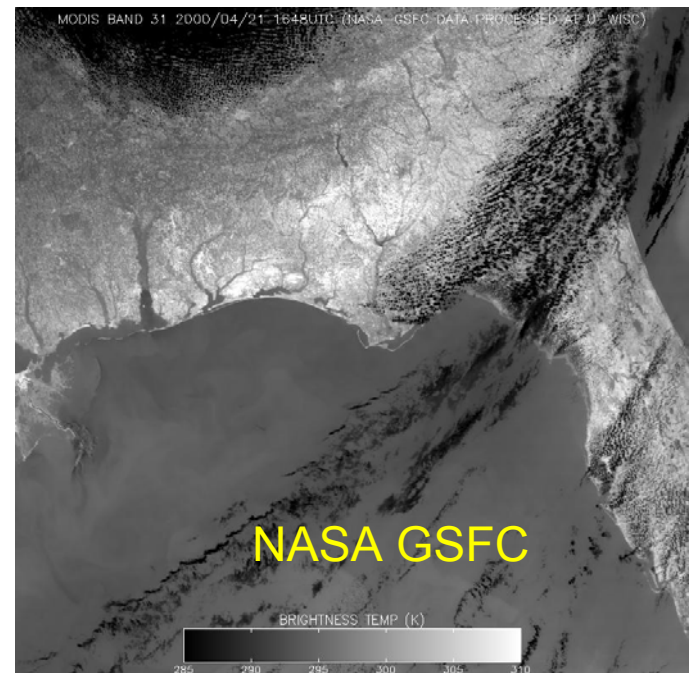
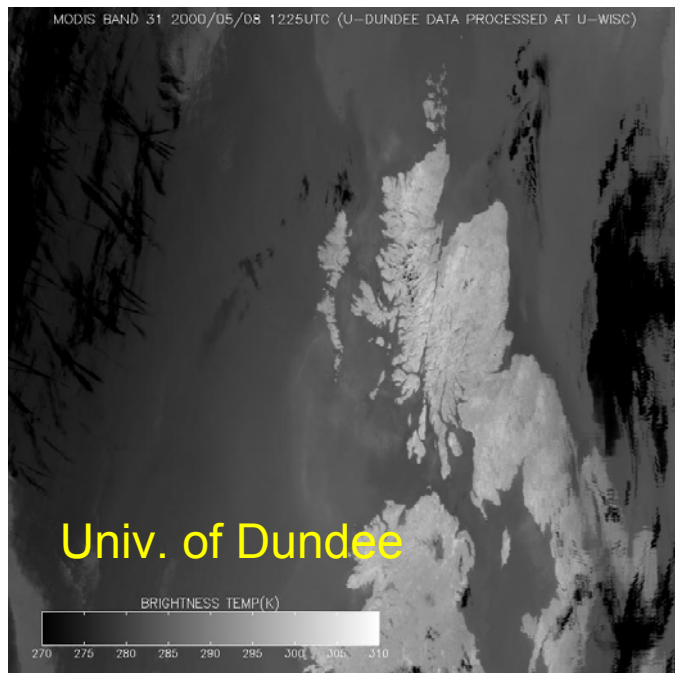
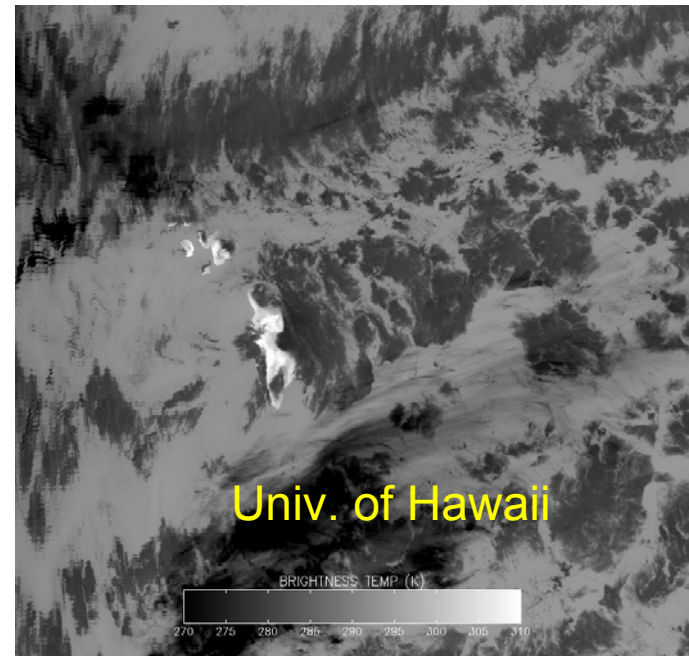
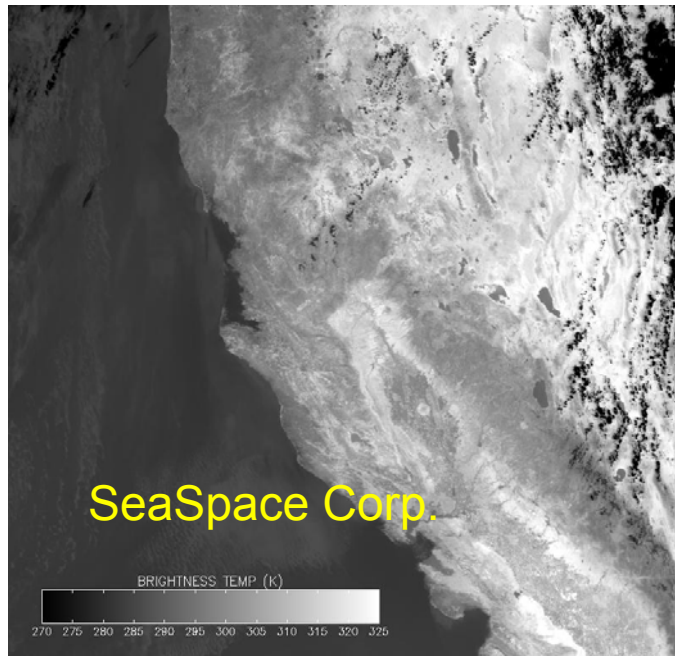
- MODIS Level 1B data contains calibrated and geolocated radiance or reflectance values observed by the instrument (top of atmosphere)
- MYD02 is the Aqua product ID (Terra=MOD02)
- MYD021KM = 1000 meter resolution
(1354 pixels across track by 2030 pixels along track for a standard 5-minute granule or 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

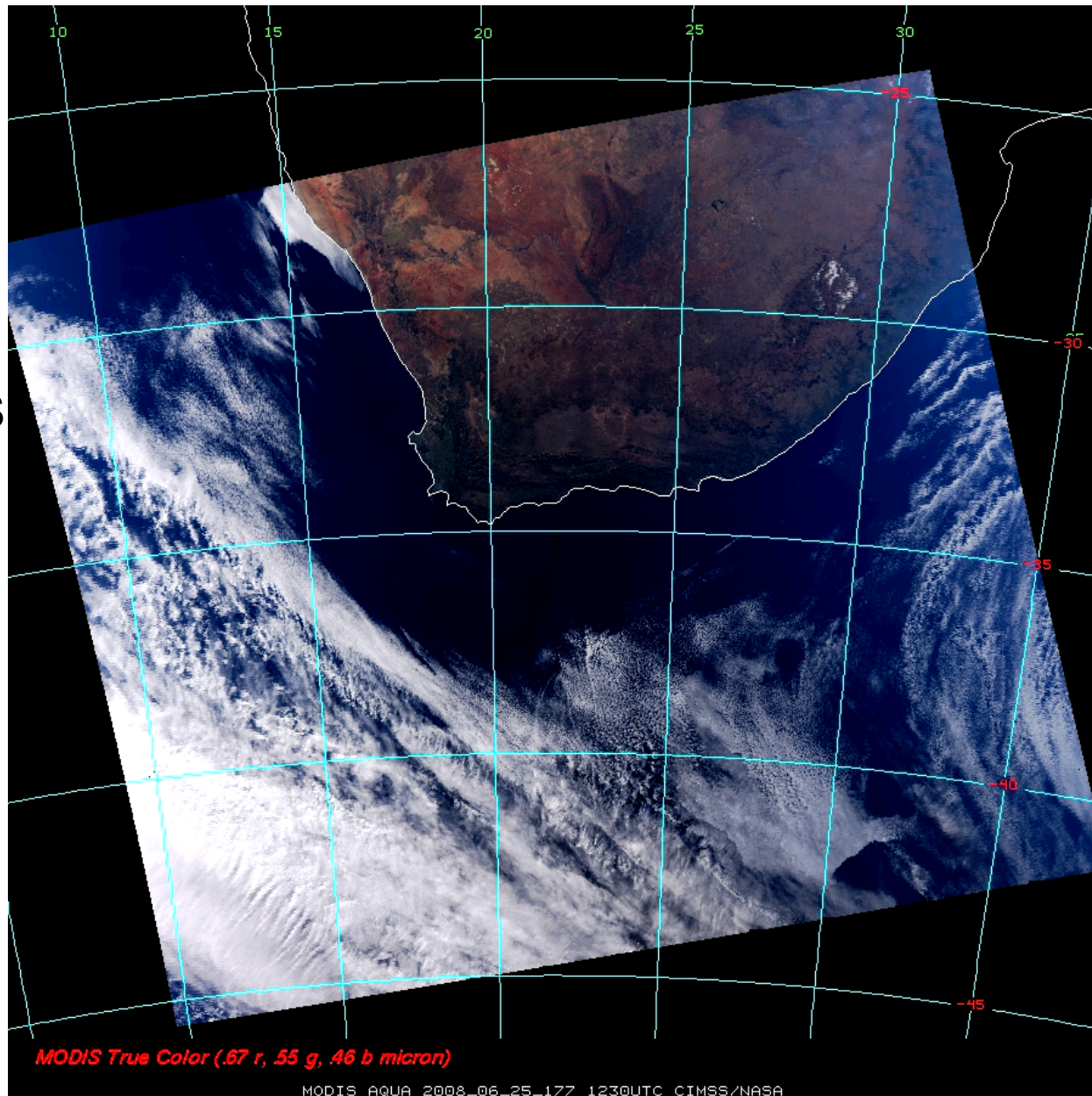
Terra MODIS



Band 2 ($0.87\ \mu\text{m}$) at 250 meter resolution

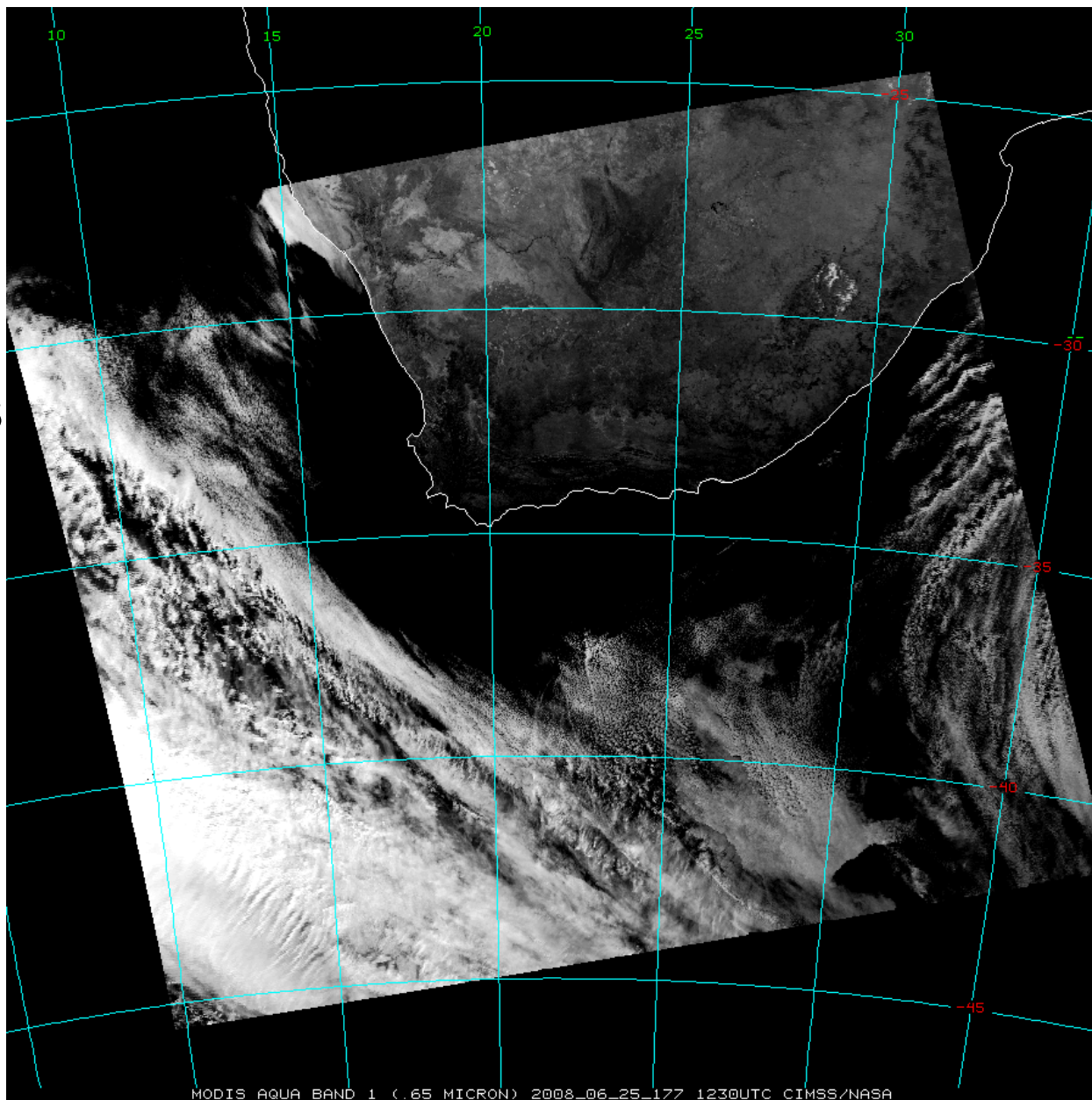
RGB Composite

Aqua MODIS
2008/06/25
1230 UTC



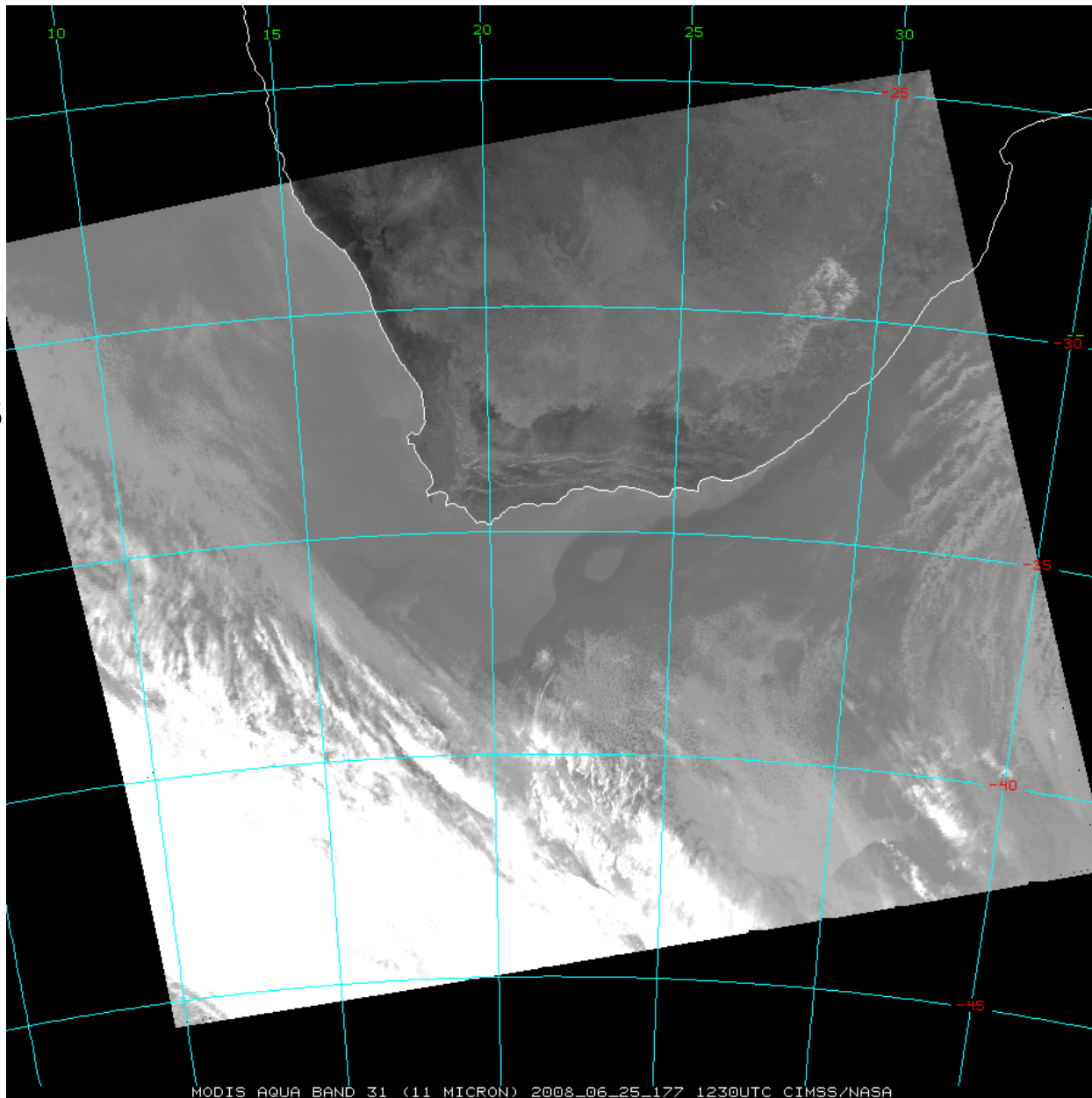
Visible: Band 1

Aqua MODIS
2008/06/25
1230 UTC



Thermal Infrared: Band 31

Aqua MODIS
2008/06/25
1230 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



International MODIS/AIRS Processing Package



[Home](#) [Download](#) [Requirements](#) [Release History](#) [Projects](#) [Related Links](#) [Credits](#) [FAQ](#)

The Direct Broadcast capability of the NASA [Terra](#) and [Aqua](#) spacecraft provide new remote sensing capabilities for the observation of planet Earth. Both of these platforms have a [direct broadcast](#) X-band downlink that allows [MODIS](#) (Terra and Aqua) and [AIRS/AMSU/HSB](#) and [AMSR-E](#) (Aqua) data to be received in real time by sites having the proper reception hardware.

The International MODIS/AIRS Processing Package (IMAPP) allows ground stations capable of receiving EOS direct broadcast to create the following products:

- MODIS Level 2 geophysical products (Terra and Aqua)
 - MODIS cloud mask (MOD35)
 - MODIS cloud top properties (MOD06CT)
 - MODIS atmospheric profiles, precipitable water and stability indices (MOD07)
 - MODIS aerosol product (MOD04)
 - MODIS Sea Surface Temperatures (IMAPP product)
 - MODIS Near Infrared Water Vapor product (IMAPP product)
- AIRS/AMSU/HSB Level 1 calibrated and geolocated radiances (Aqua)
- AIRS/AMSU/HSB Level 2
 - JPL DAAC Product
 - Single Field-of-View Product (IMAPP product)
- AMSR-E Level 1 calibrated and geolocation radiances (Aqua)
- AMSR-E Level 2 geophysical products (Aqua)
 - AMSR-E Rain Rate
 - AMSR-E Soil Moisture
 - AMSR-E Snow Water Equivalent

IMAPP is derived from the operational EOS processing software developed at NASA GSFC and JPL, and has been modified to be compatible with direct broadcast data. The main differences between IMAPP and the operational software are

- portability,
- wherever possible, the reliance on toolkits has been eliminated,
- the IMAPP processing environment is greatly simplified,
- overpasses of arbitrary size may be processed.

What's New

- [AIRS Level 1B HDFEOS to BUFR Utility](#)
- [AIRS Utility Release: MODIS/AIRS collocation, AIRS Cloud Mask, UWAIRS Single FOV retrieval package](#)
- [DB Google Earth True Color Imagery Software](#)
- [DBCAS Numerical Weather Prediction Forecast Model](#)

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

Other Products:

- AIRS/AMSU Level 1B Calibrated And Geolocated Radiances
- AIRS/AMSU JPL Atmospheric Profiles
- AIRS UW Single FOV Atmospheric Profiles (Clear Sky Only)
- AIRS/MODIS Single FOV Atmospheric Profiles (Clear and Cloudy)
- AMSR-E Level 2 Geophysical Products
- AMSR-E Snow Water Equivalent
- DBCRA Numerical Weather Prediction Model

What does IMAPP do?

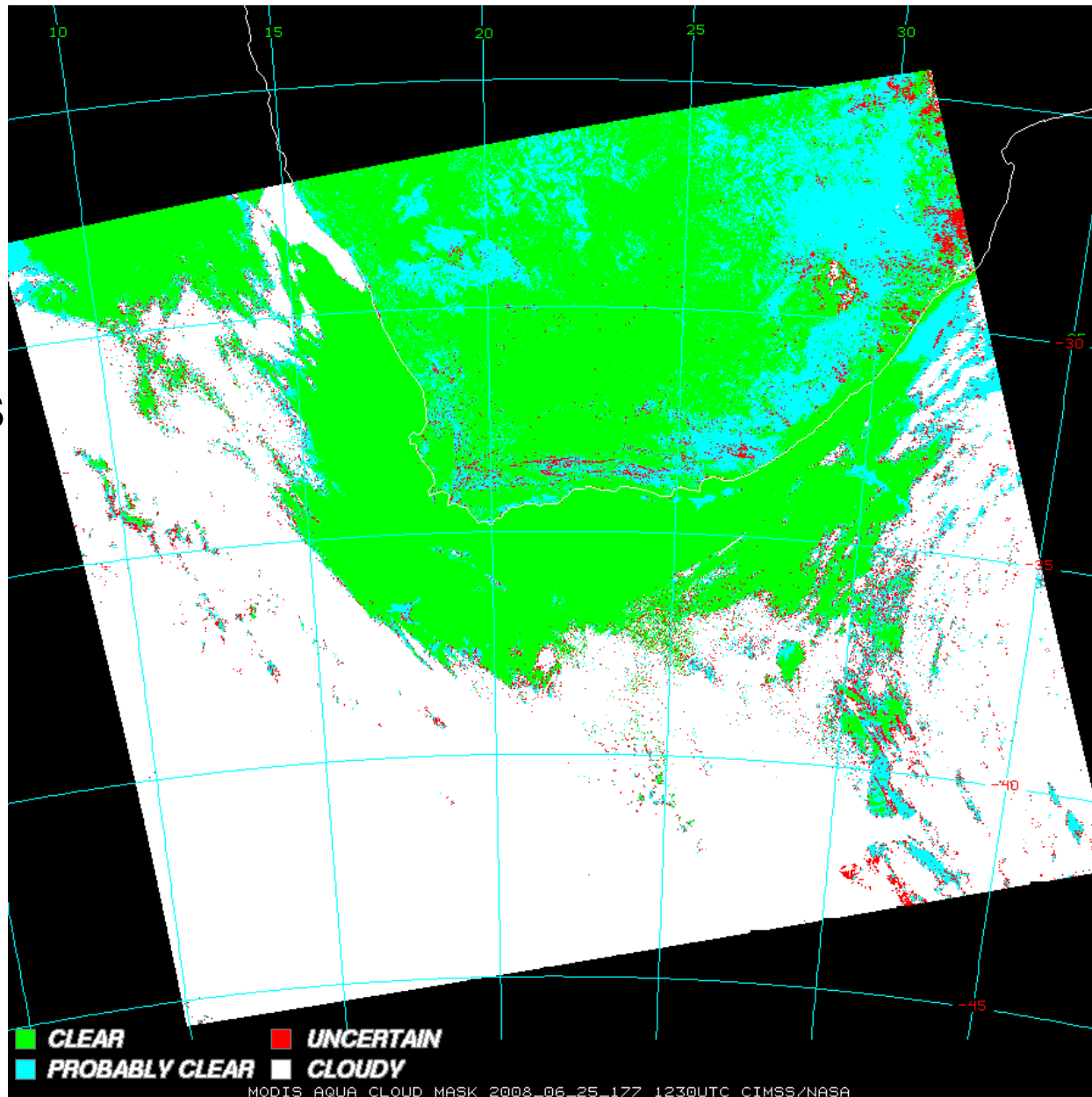
Purpose: Creates MODIS atmosphere, utility, and image products (and AIRS, AMSU, AMSR-E)

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)

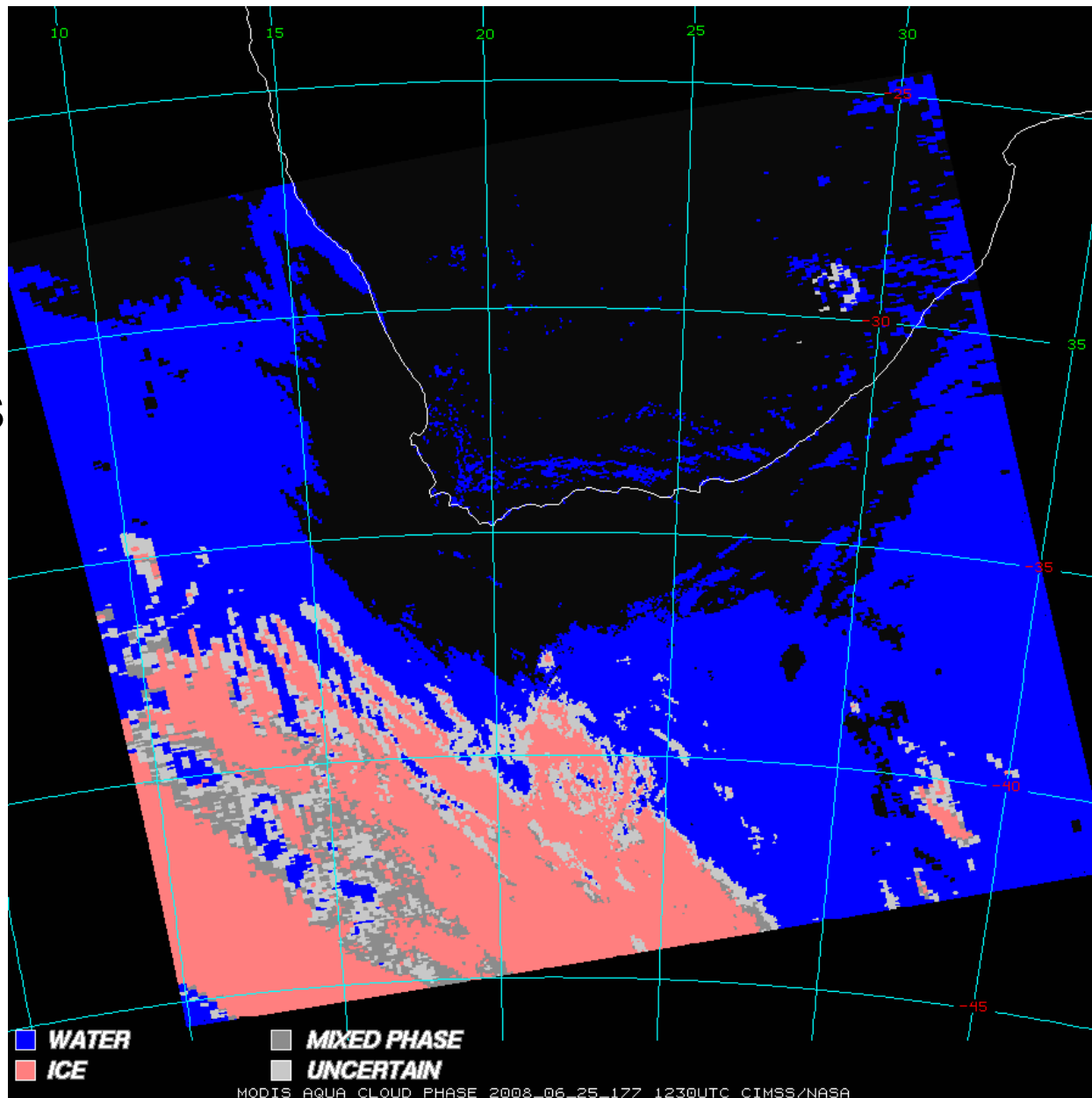
Cloud Mask

Aqua MODIS
2008/06/25
1230 UTC



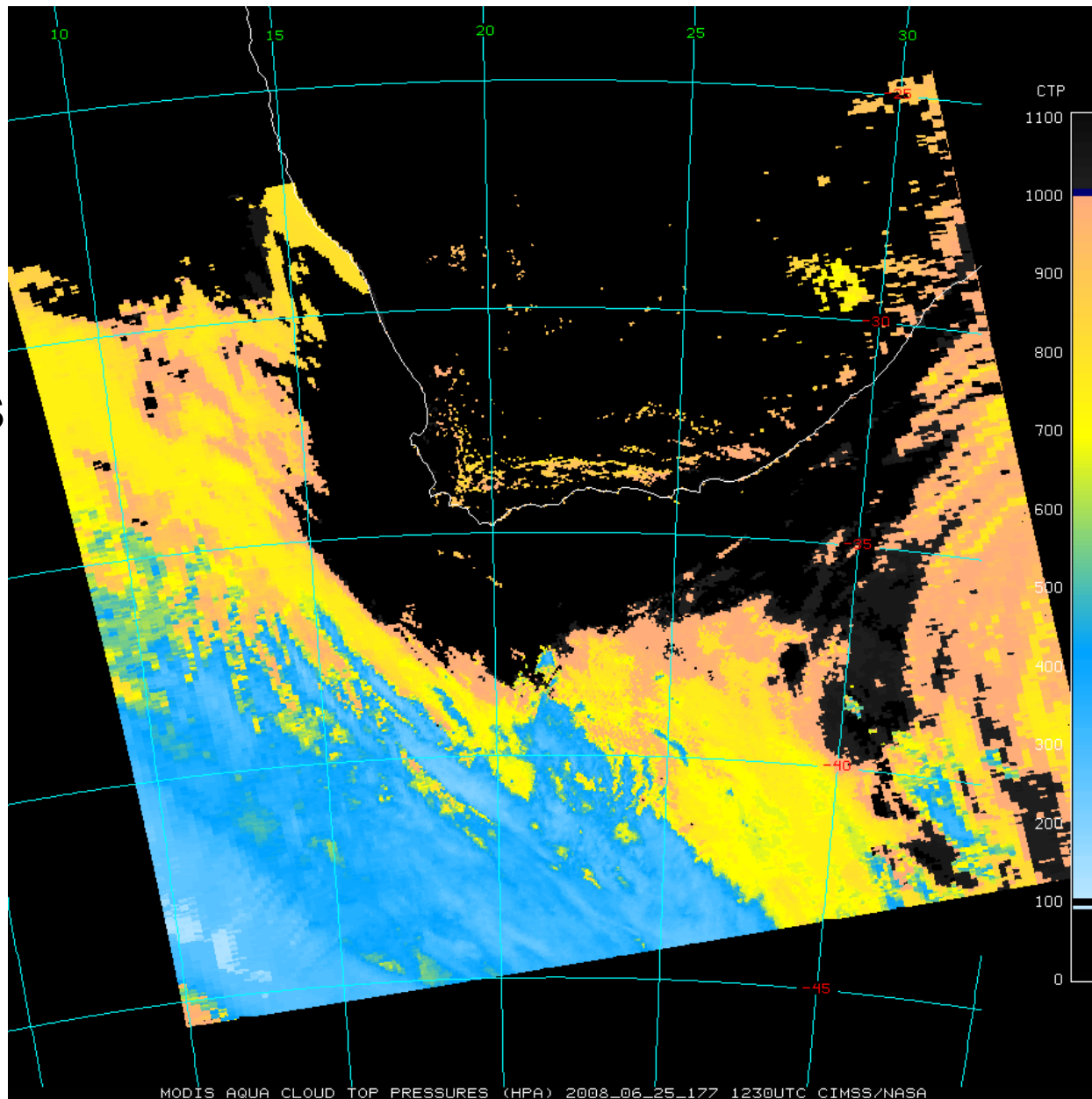
Cloud Phase

Aqua MODIS
2008/06/25
1230 UTC



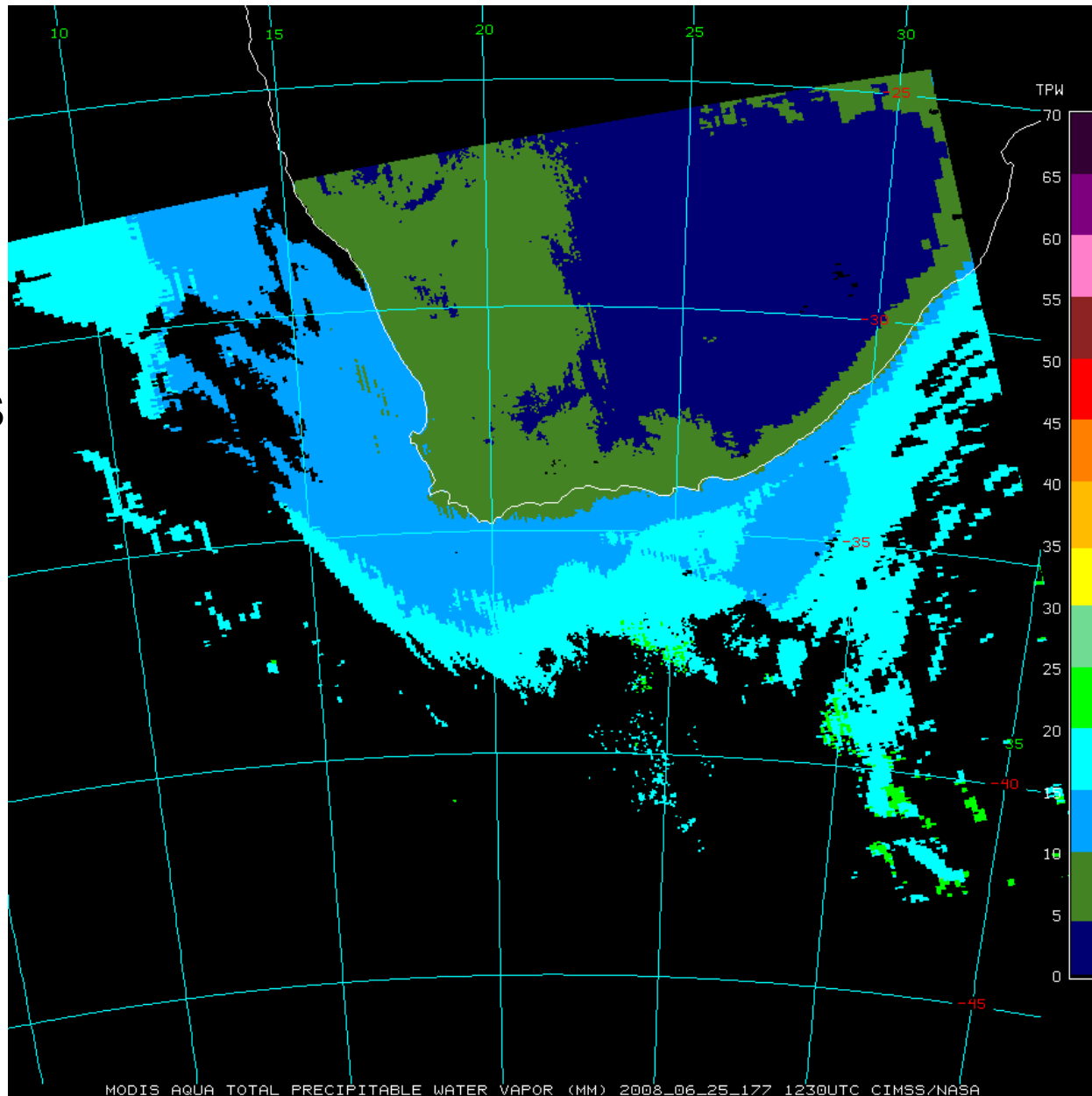
Cloud Top Pressure

Aqua MODIS
2008/06/25
1230 UTC



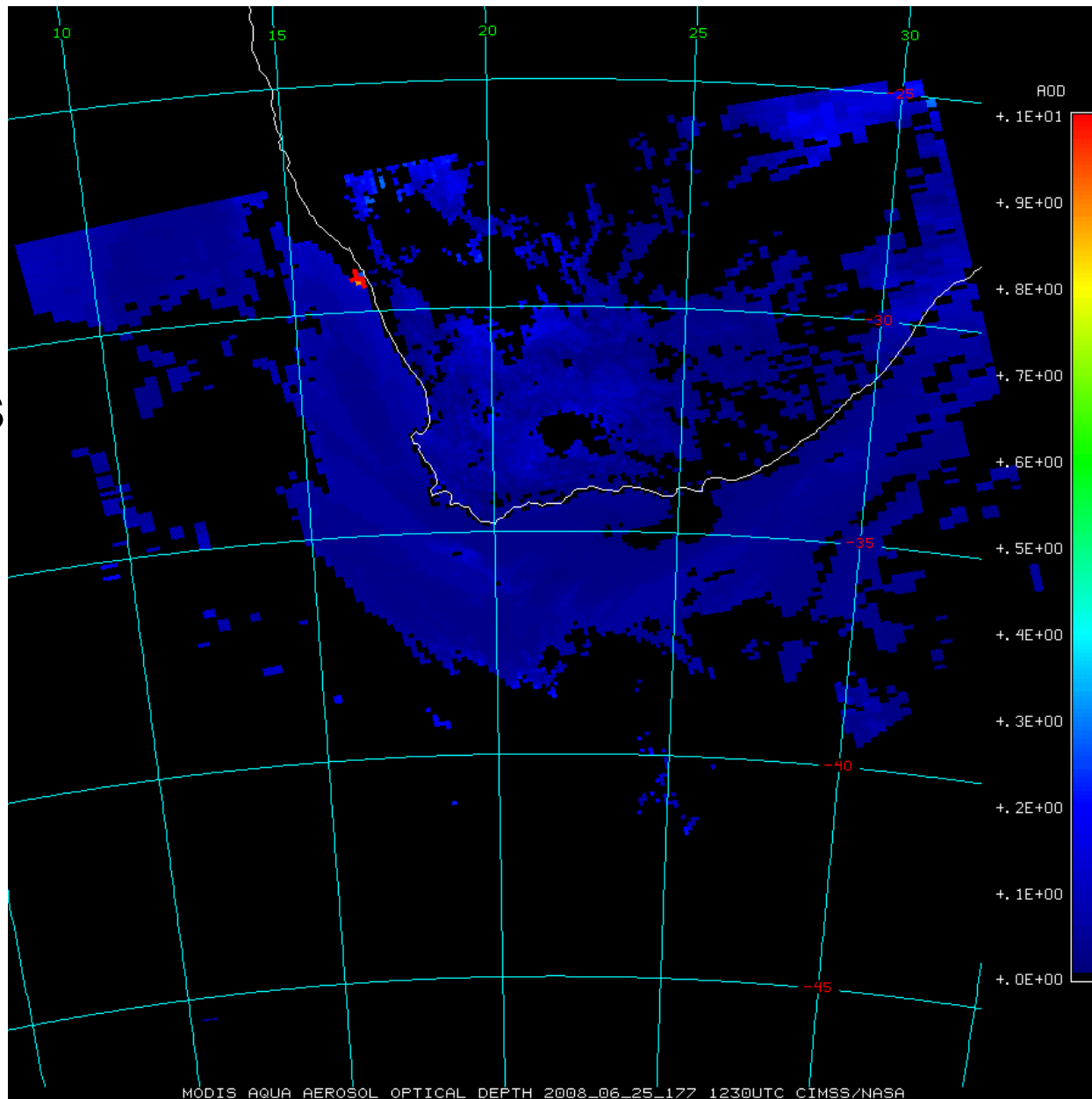
Total Precipitable Water

Aqua MODIS
2008/06/25
1230 UTC



Aerosol Optical Depth

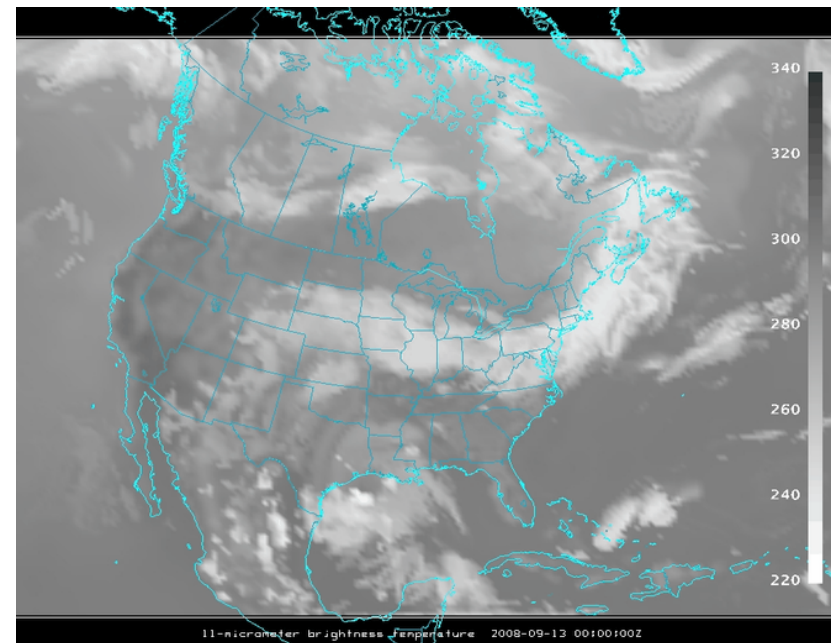
Aqua MODIS
2008/06/25
1230 UTC



DBCRA S NWP Model

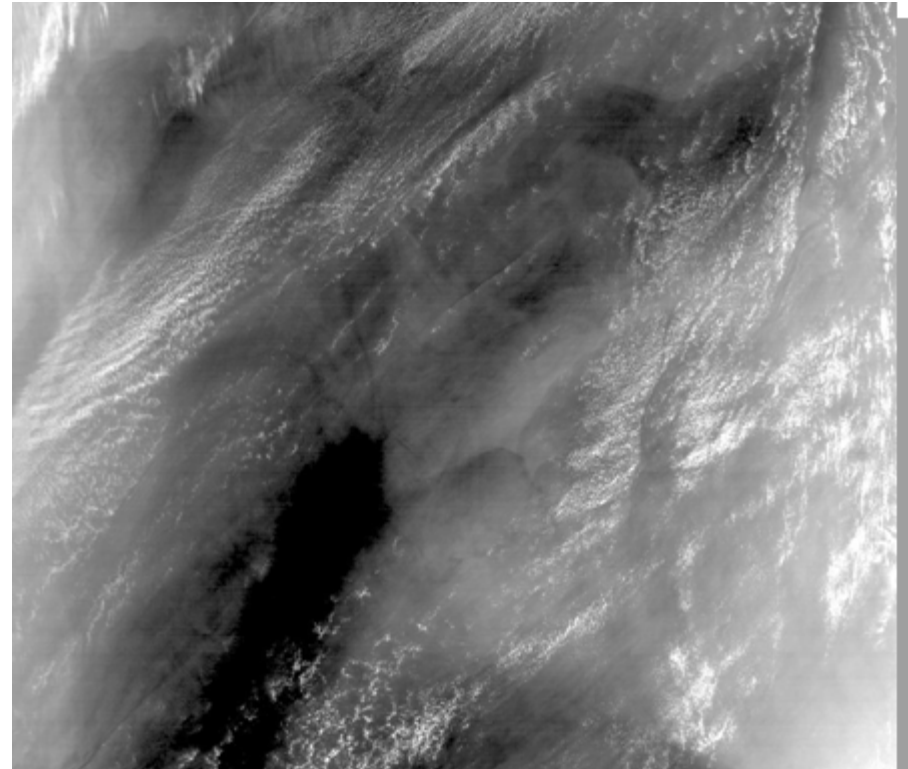
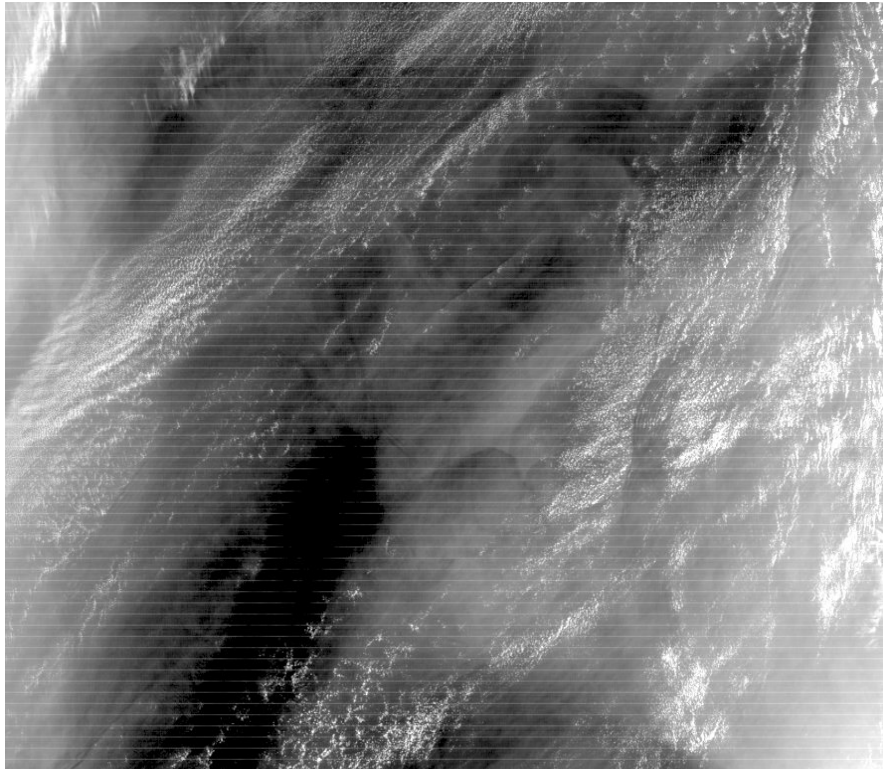
- Easy to install and easy to execute on modest PCs
- NWP domain centered on your DB location
- Assimilates IMAPP MOD07 TPW and MOD06CT Cloud Top Pressure and Cloud Effective Emissivity in order to adjust the cloud and moisture fields in the GFS.
- Output is standard meteorological parameters in GRIB2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



True Color Images for Google Earth



Images can be ready within 30 minutes of acquisition

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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/>

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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](#)
[IPOP 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		

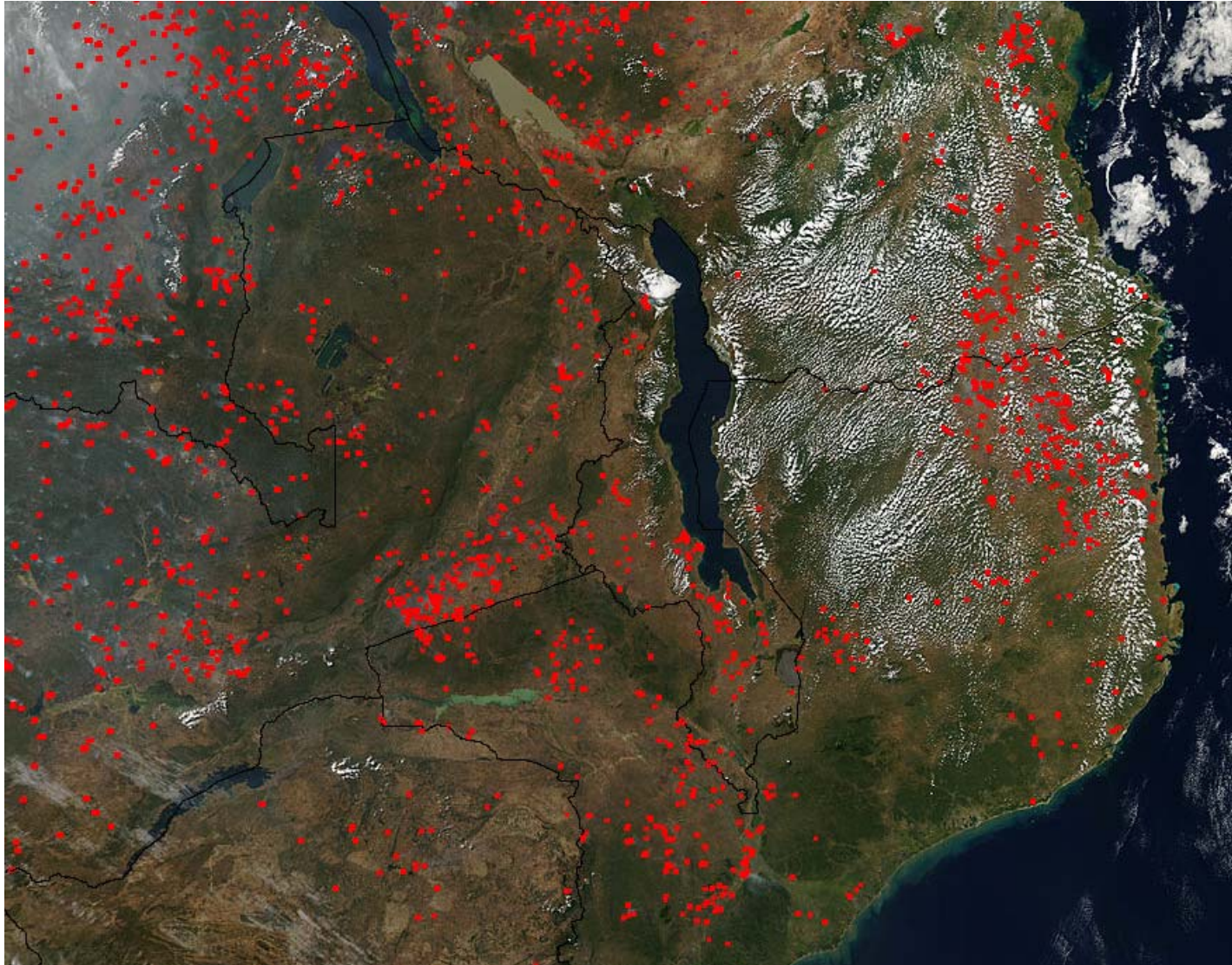
What does SPA do?

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)**

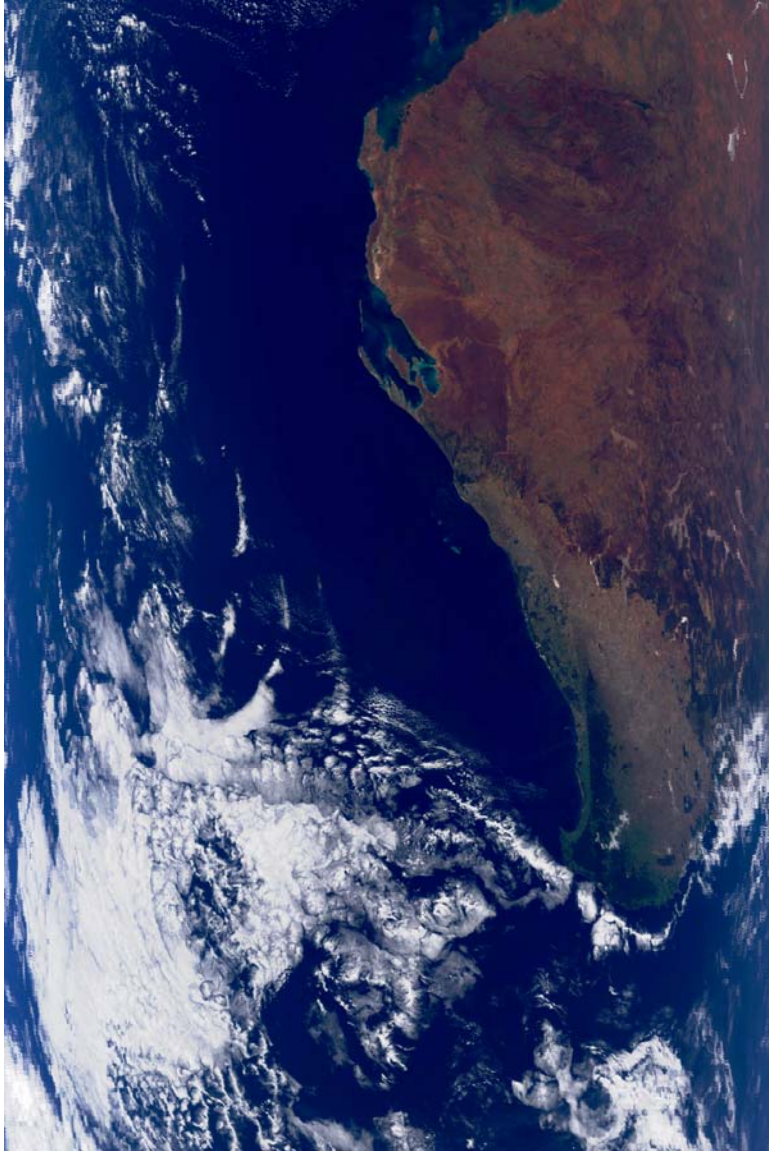
Active Fires



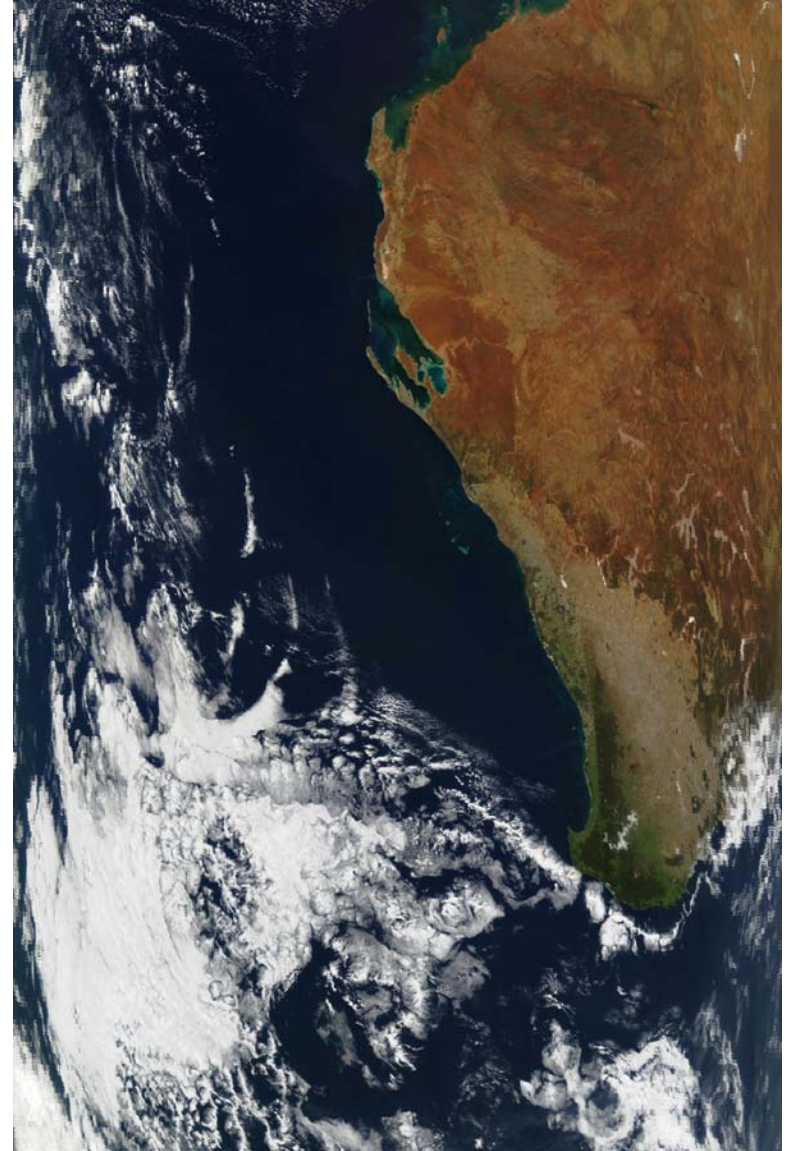
6/24/09 Aqua MODIS

Corrected Reflectance

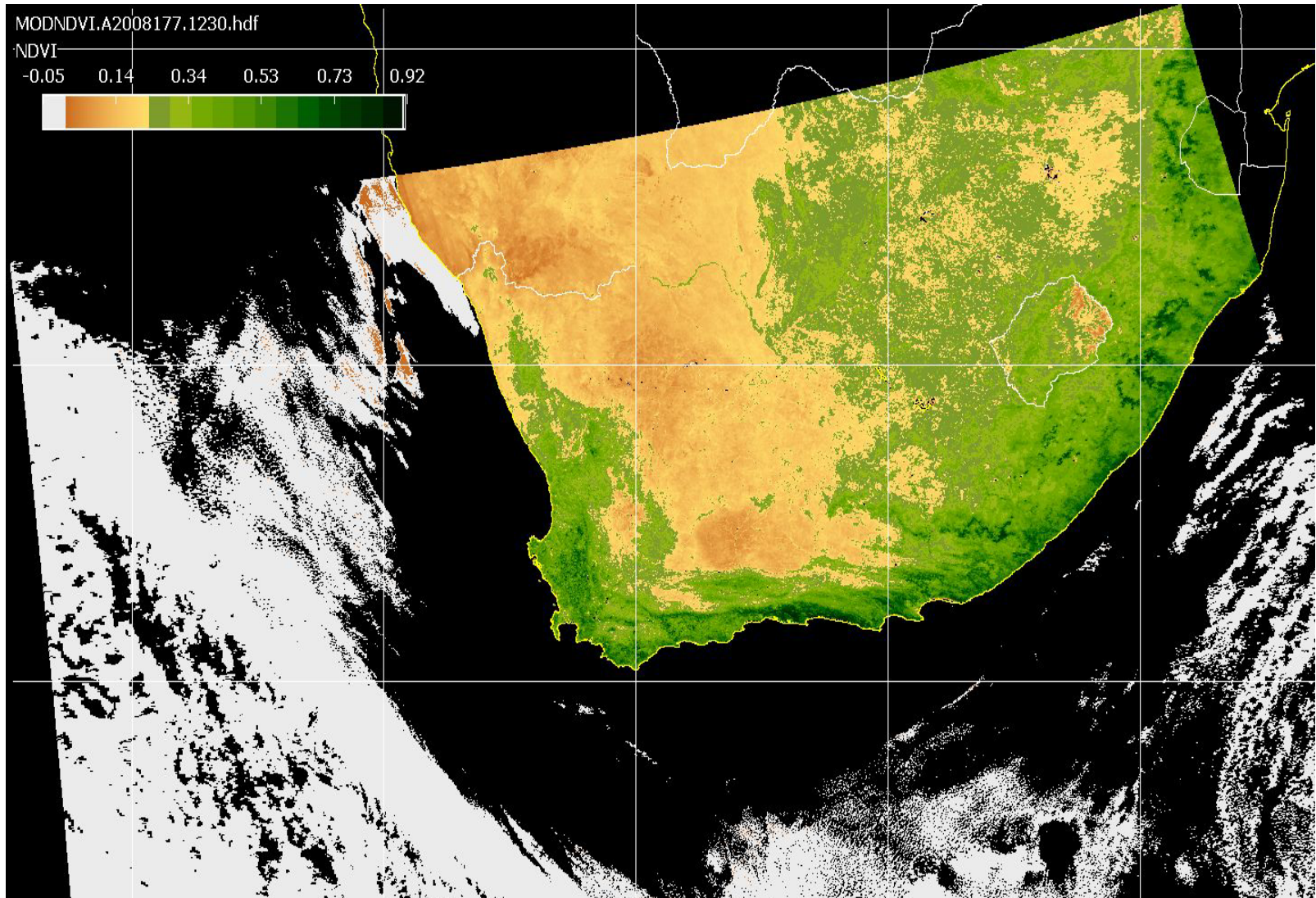
Before



After

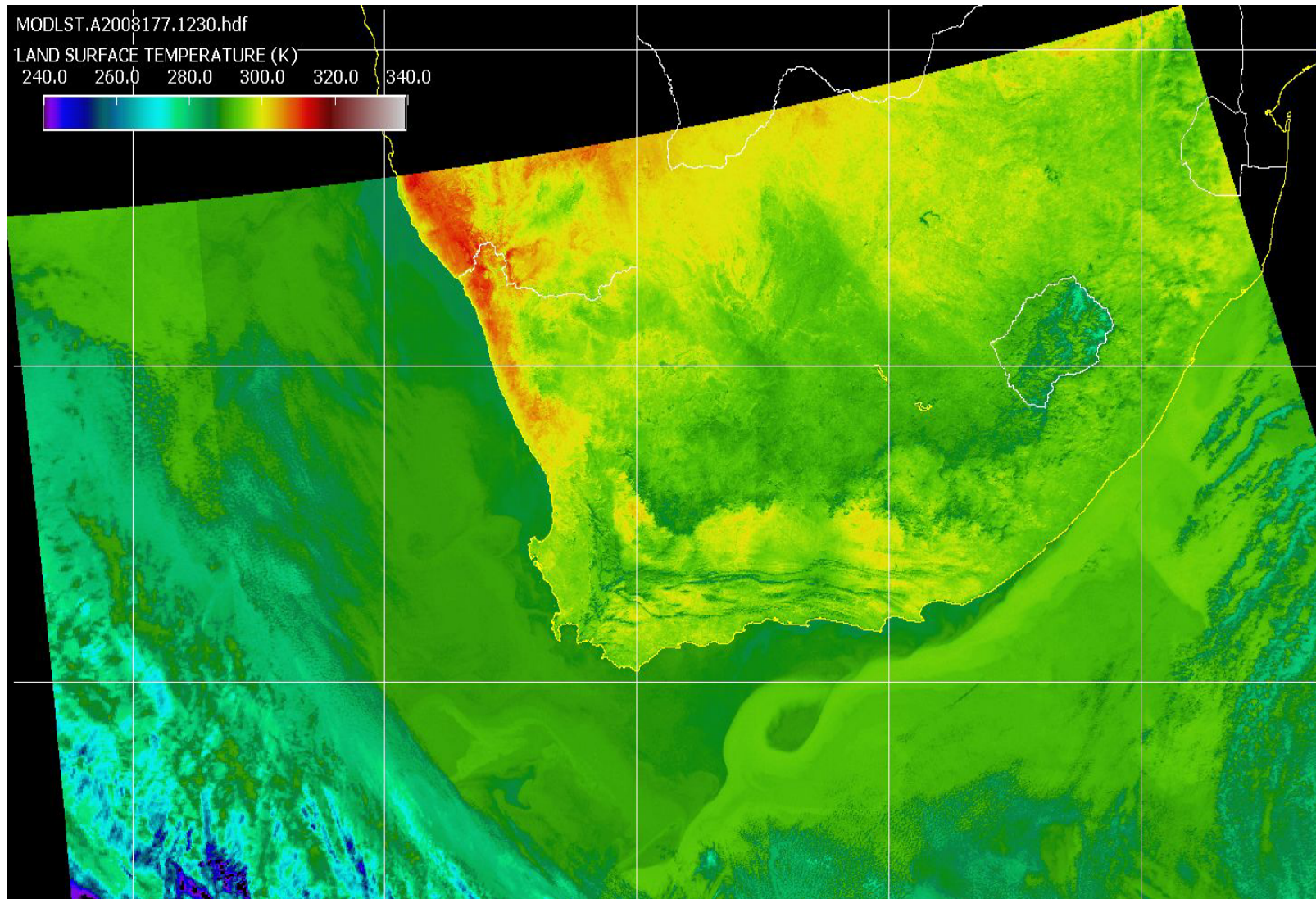


Normalized Difference Vegetation Index



Aqua MODIS 2008/06/25 1230 UTC

Land Surface Temperature



Aqua MODIS 2008/06/25 1230 UTC

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

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MODIS DB Ocean Products

Software: **SeaDAS**

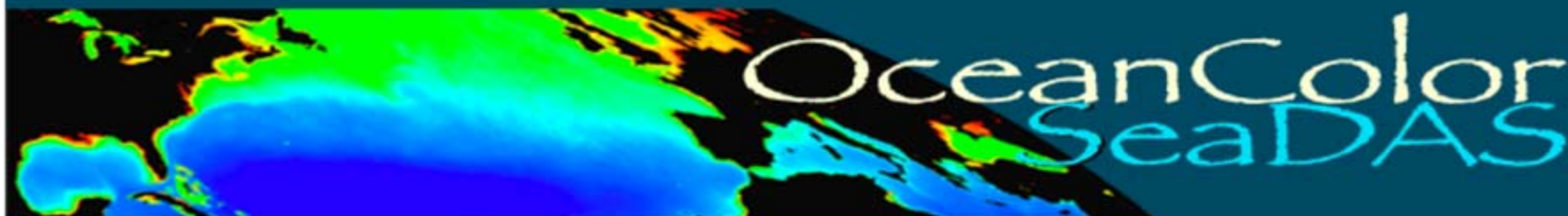
Developers: NASA Ocean Biology Processing
Group, MODIS Science Team

Distributor: NASA Ocean Biology Processing Group

Platforms: Linux, OS X, Windows (VM)

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

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SeaDAS Web

Support

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[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

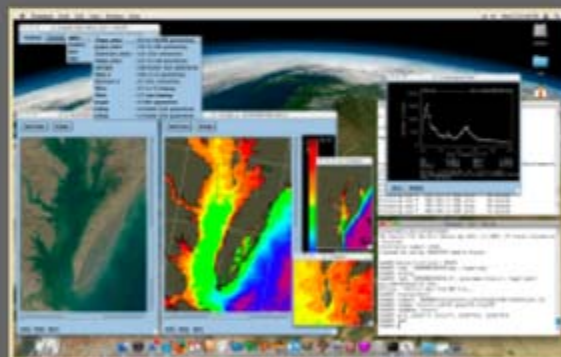
[Data Product Specifications](#)
[Data Format Specifications](#)
[Processing Versions Chart](#)

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](#).

- o [Features](#)
- o [Requirements](#)
- o [Online Help](#)
- o [SeaDAS FAQ](#)
- o [User Contributed Software](#)

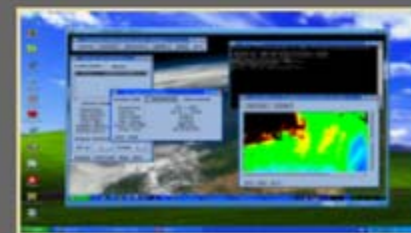
What's New

[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 Main Menu (pid = 2100)

Display Process Utilities Update Help Quit

Product Selection For MODIS File

MODIS Filename: /Users/gumley/data/A2006073124000.L2_LAC Select Okay



Band List Selection

Loaded Bands : Delete

- 1. sst : A2006073124000.L2_LAC
- 2. chlor_a : A2006073124000.L2_LAC

Current Product Information

Dimensions: 1354 x 2030

Raw Min/Max: -1.000 / 203.7

Slp/Intcpt: 1.00000 / 0.000

Scale Type: LIN

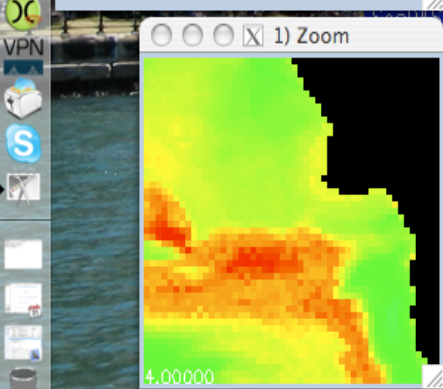
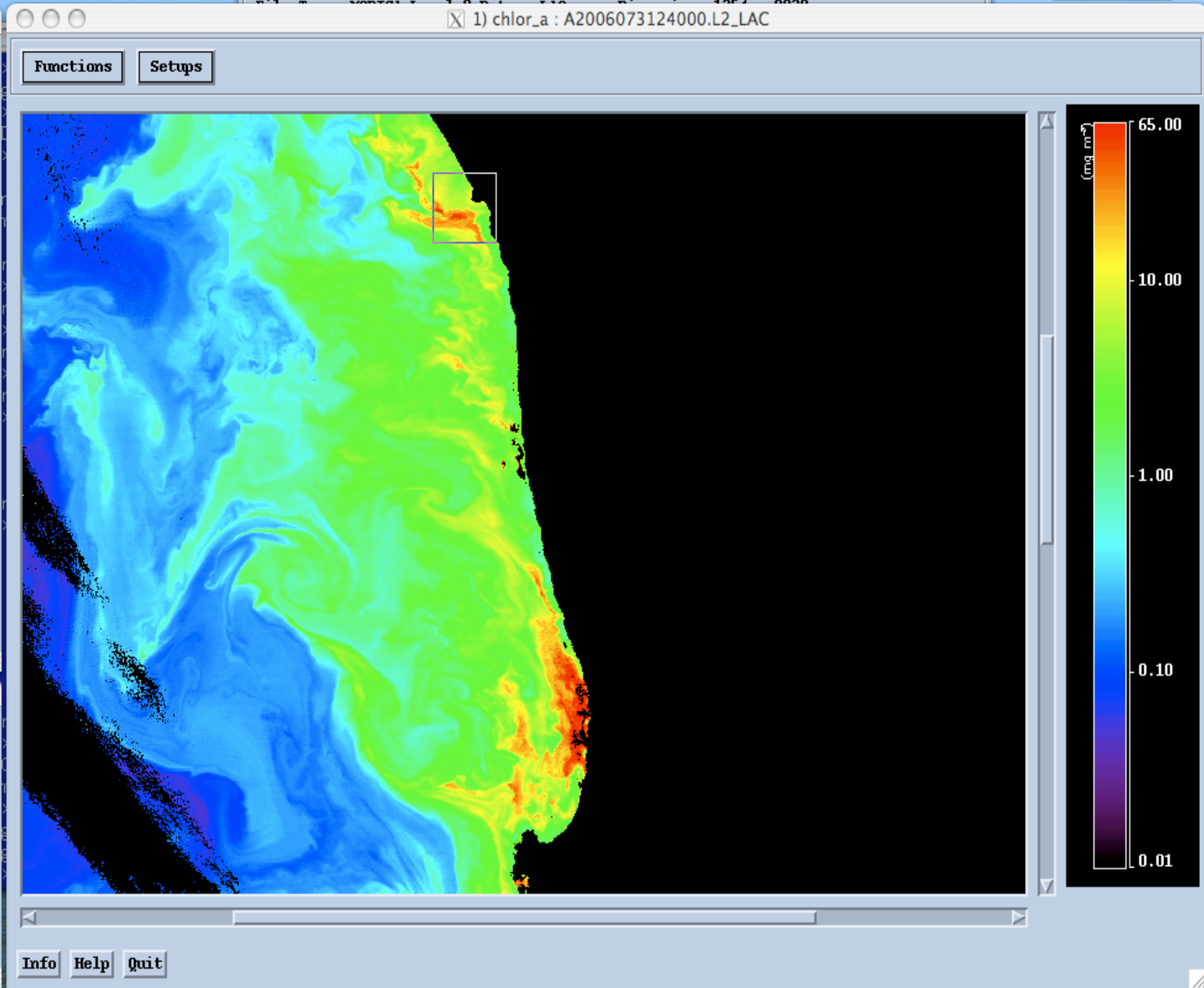
GeoPhys Min/Max: -1.000 / 203.7

GeoPhys Units: mg m⁻³

Display Controls:

LUT no.: 1 Window: 2

Display Band Info Help Quit



SeaDAS Main Menu (pid = 2100)

Display Process Utilities Update Help Quit

Product Selection For MODIS File

MODIS Filename: /Users/gumley/data/A2006073124000.L2_LAC Select Okay

Band List Selection

Loaded Bands : Delete

1. sst : A2006073124000.L2_LAC
2. chlor_a : A2006073124000.L2_LA

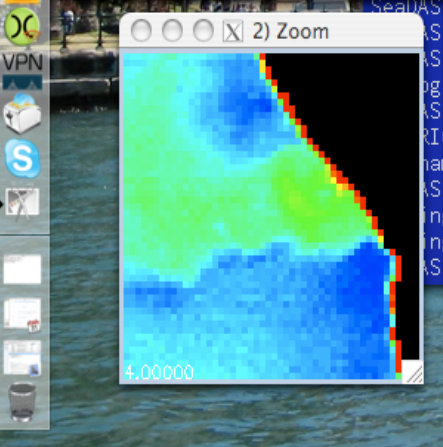
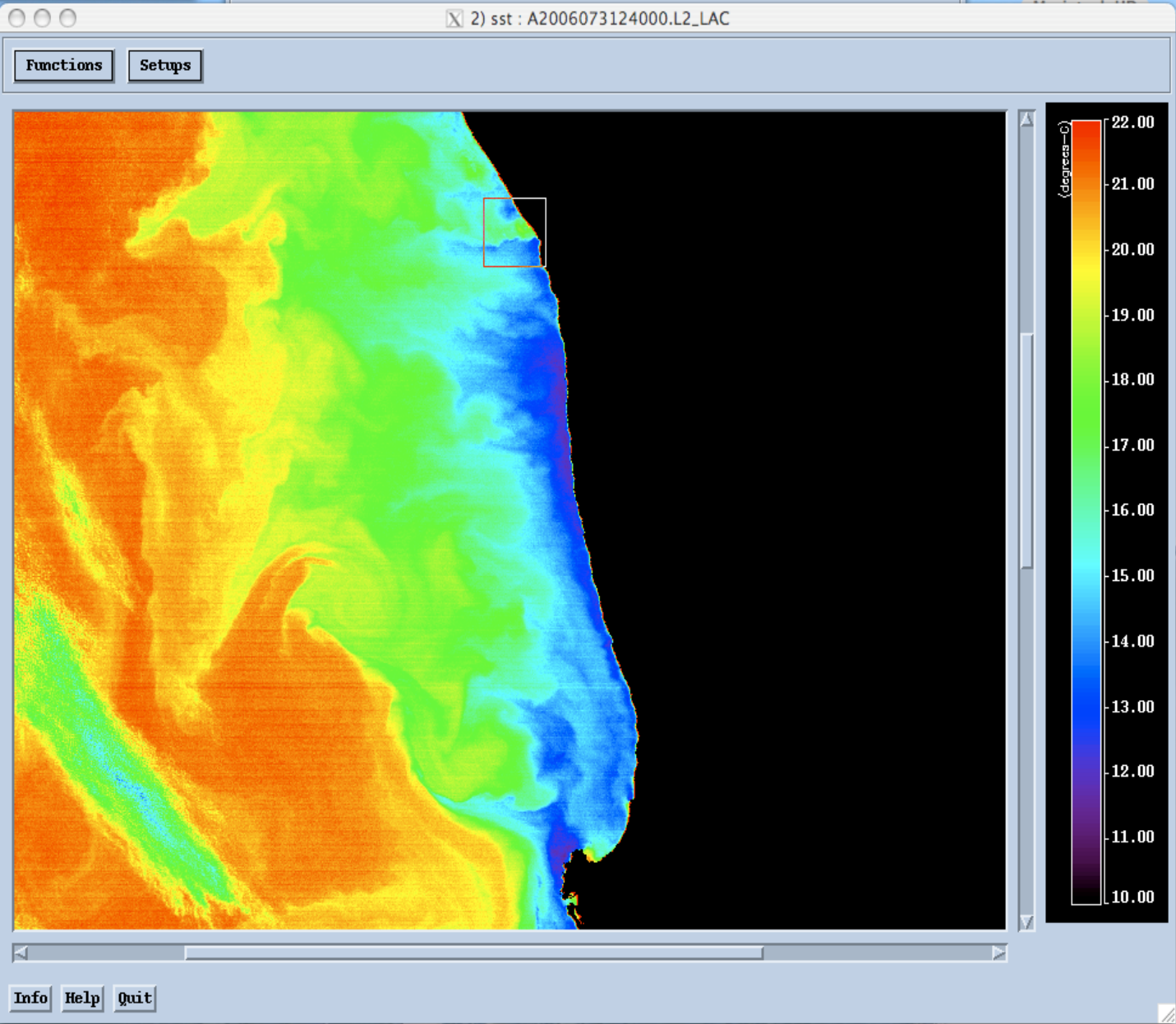
Current Product Information

Dimensions: 1354 x 2030
Raw Min/Max: -32767 / 8274
Slp/Intcpt: 0.00500 / 0.000
Scale Type: LIN
GeoPhys Min/Max: -163.8 / 41.37
GeoPhys Units: degrees-C

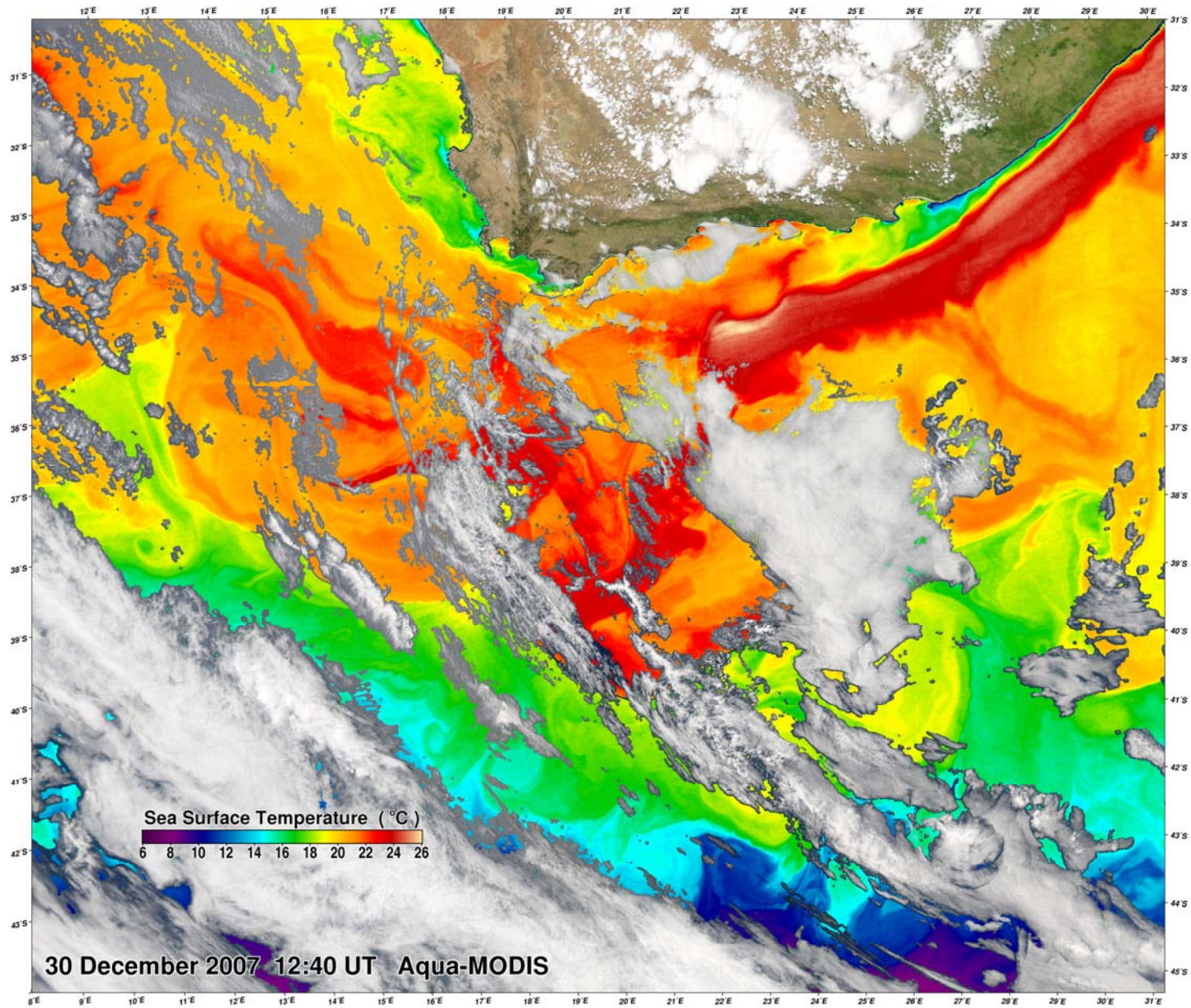
Display Controls:

LUT no.: 1 Window: 1

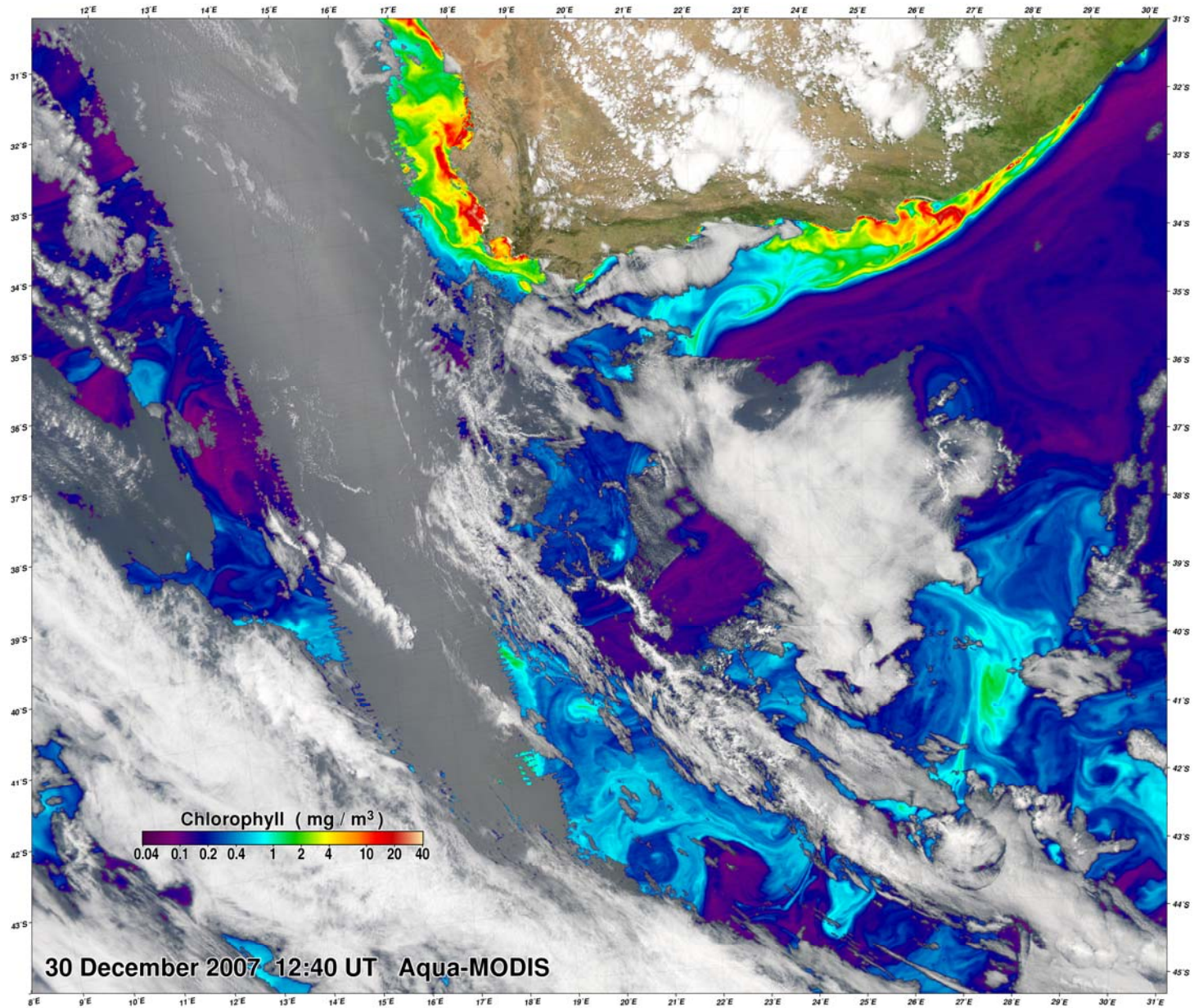
Display Band Info Help Quit



Agulhas & Benguela Currents: SST



Agulhas & Benguela Currents: Chlorophyll



What is a DB VM?

Your software sounds great. But I just have a Windows XP computer.

No problem! All of the software mentioned so far runs inside a Linux virtual machine (VM) on Windows XP or Vista.

Anyone* can run a full featured DB processing system on a modest Windows computer, and all of the required software is *FREE!

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

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 free Linux application for reprojecting MODIS Level 1B and Level 2 products to a map grid (removes bowtie artifacts)
- **HDFLook** is a free Linux application for interactive display and quantitative analysis of MODIS Level 1B and Level 2 products
- **SeaDAS** is a free Linux and Windows application for processing, display, and analysis of MODIS Level 1B and Ocean Level 2 products

Just Google the software names...



seadasvm VMware Player Devices

SeaDAS Main Menu (pid = 4622)
Display Process Utilities Update Help Quit

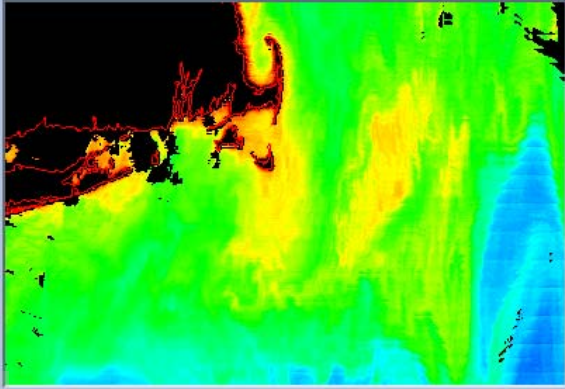
Band List Selecti...
Loaded Bands : Delete
1. chlor_a : A2006167181000.L2 LA

1) Cursor Position
Display Mode: ☒ Interactive ☐ Mouse button
Current Product:
Dimensions: Pixel/Line : 957 / 1079
Raw Min/Max: Lat/Lon : 40.11 / -73.02
Slp/Intcpt: Data Value : 0.8513
Scale Type: Geo. Value : 0.8513
GeoPhys Min/Max: Pixel YYYY/DDD : 2006/167
GeoPhys Units: Pixel Time 18: 2006.5
Quit Help

SeaDAS

LUT no.: 1 Window: 2
Display Band Info Help Quit

terminal
IDL Version 7.0 (linux x86 m32). (c) 2007, ITT Visual Information Solutions
% Embedded IDL: NASA GSFC SeaDAS Development, SeaDAS.
% Embedded IDL: NASA GSFC SeaDAS Development, SeaDAS.
SeaDAS Version 5.3.0 (pid = 4622)
GENERIC_FILE_TYPE detected a MODIS file.
grp_name=Geophysical Data
Getting - "chlor_a" data from HDF file...
█

1) chlor_a : A2006167181000.L2_LAC
Functions Setups

Info Help Quit

start 1 2 terminal SeaDA... Band Li... 1) chlor... 1) Cur... 02:53:00 PM vmware

Windows XP

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 software 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/>

Outline

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MODIS DB Data in South Africa

CSIR provides real-time MODIS products (Level 0 through Level 2) at

<http://afis.meraka.org.za/wamis>



WAMIS

Wide Area Monitoring Information System

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Welcome!

Welcome to the Wide Area Monitoring System (WAMIS) home page. WAMIS offers you this free portal where you can download various satellite imagery and products.

Below you'll find our latest data products as well as some interesting news articles relating to our remote sensing data.

Please visit our [products page](#) for an overview of all entire catalogue.



Live feed of MODIS antenna in Pretoria, South Africa.
Local time: 21:13:41; Next overpass: 21:40:49

Latest Products

We generate a number of products for Southern Africa. Below is our most recent products. Download these by following the links at the bottom of the images.

Please see our [products](#) page for our full catalogue.

MODIS True Colour Swath

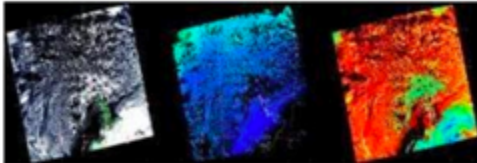


MODIS False Colour 721



MODIS Data from NASA

- NASA provides MODIS Level 0, Level 1B, Land, Ocean and Atmosphere Products at no cost
- Timeliness varies: At present, best turnaround is about 24 hours. However, LAADS will soon provide data within 2 hours of acquisition.
- LAADS is the most useful site for ordering and downloading MODIS Level 0, Level 1B, and Atmosphere products
- The LAADS web interface can be learned in a few minutes; you just provide an email address (so they can notify you when your data is ready)



LAADS Web

Level 1 and Atmosphere Archive and Distribution System

[+ HOME](#)[- DATA](#)[+ IMAGES](#)[+ TOOLS](#)[+ HELP](#)

Search for Level 1 and Atmosphere Products

If you know the file names of the products for which you are searching, you may also [search for file names](#).

Product Selection

Please select one or more products:

[+ View Help](#)

Satellite/Instrument:

Terra MODIS ☒

Aqua MODIS ☐

Combined Terra & Aqua MODIS ☐

Ancillary Data ☐

Group:

Terra Level 1 Products

Products:

MOD01 - Level 1A Scans of raw radiances in counts
MOD021KM - Level 1B Calibrated Radiances - 1km
MOD02HKM - Level 1B Calibrated Radiances - 500m
MOD02OBC - Level 1B Onboard Calibrator/Engineering Data
MOD02QKM - Level 1B Calibrated Radiances - 250m
MOD02SSH - MODIS/Terra Level 1B Subsampled Calibrated Radiances 5km
MOD03 - Geolocation - 1km
MODASRVN - AERONET-based Surface Reflectance Validation Network

Please read the [disclaimer](#) about the Collection 5 MOD04_L2 and MYD04_L2 products.

Temporal Selection

Please enter the temporal information in either MM/DD/YYYY or YYYY-DDD format:

[+ View Help](#)

Temporal Type:

Date and Time Range

Start Date and Time:

06/01/2009 00:00:00

End Date and Time:

07/03/2009 23:59:59

<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/>



End

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