

# Visualization and Analysis of IMAPP and CSPP Products in McIDAS-V

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# Outline

- What is McIDAS?
  - McIDAS-X
  - McIDAS-V
- IMAPP products
- CSPP products
- Other capabilities

# McIDAS

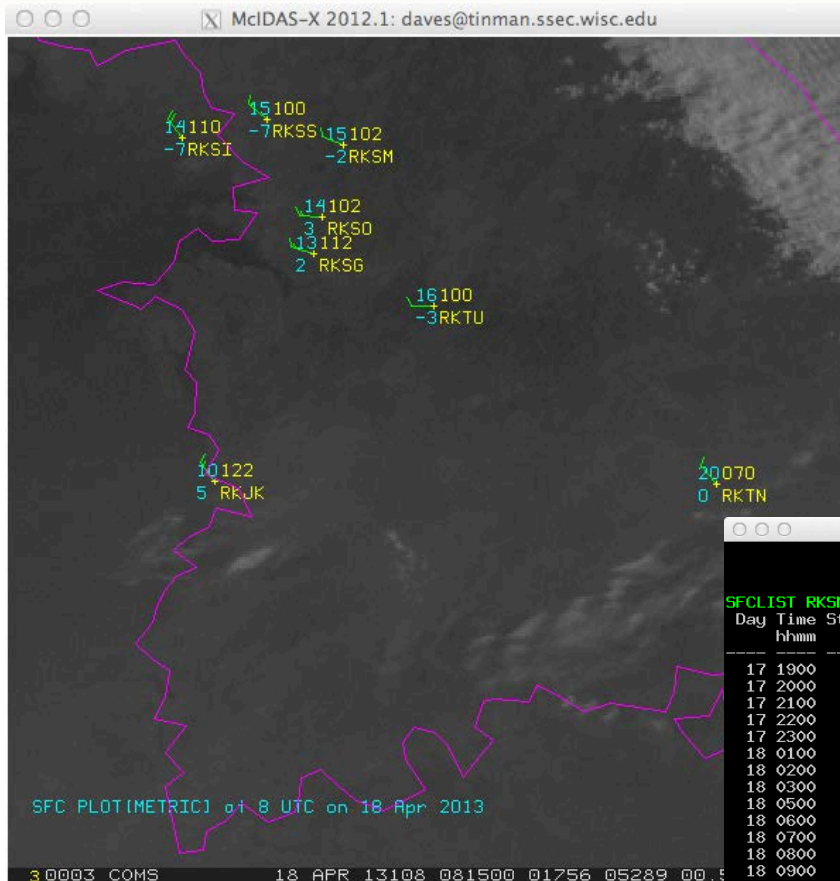
## Man computer Data Access System

### McIDAS-X

- Visualization of satellite and weather data
- Heritage code: 40 years old
- Current version: Based in Unix and X Windows
- Expected to be supported at least as long as the current GOES series, circa 2020.
- Licensed



# McIDAS-X



McIDAS-X 2012.1: daves@tinman.ssec.wisc.edu

SFCLIST RKSM 20 UNIT=M

Day	Time	StCo	Stn	T	Td	Dir	Spd	Gus	AltSet	Vis	Weather	Ceill
	hhmm		id	[C]	[C]		[ mps ]		[mb]	[km]		
17	1900	KR	RKSM	12	9	170	3		1009.1	5.95	F	5/008
17	2000	KR	RKSM	11	8	180	3		1009.5	4.83	F	5/008
17	2100	KR	RKSM	11	6	170	3		1009.5	8.05	F	8/024
17	2200	KR	RKSM	11	3	280	2		1010.2	9.01	H	8/024
17	2300	KR	RKSM	11	2	310	1		1010.5	9.01	H	5/009
18	0100	KR	RKSM	11	4	290	1		1011.8	9.01	H	5/009
18	0200	KR	RKSM	13	4	320	3		1011.8	9.01	H	5/061
18	0300	KR	RKSM	14	4	320	4		1011.8	9.01	H	
18	0500	KR	RKSM	16	0	330	4		1010.5	11.27		
18	0600	KR	RKSM	16	2	320	4		1010.2	11.27		
18	0700	KR	RKSM	15	-1	310	5		1010.2	11.27		
18	0800	KR	RKSM	15	-2	300	4		1010.2	11.27		
18	0900	KR	RKSM	14	-2	290	5	10	1010.5	11.27		
18	1100	KR	RKSM	12	-6	330	3		1012.2	11.27		
18	1200	KR	RKSM	11	-6	330	4		1013.5	11.27		
18	1300	KR	RKSM	11	-6	350	5		1014.5	11.27		
18	1400	KR	RKSM	10	-2	040	4		1015.6	11.27		

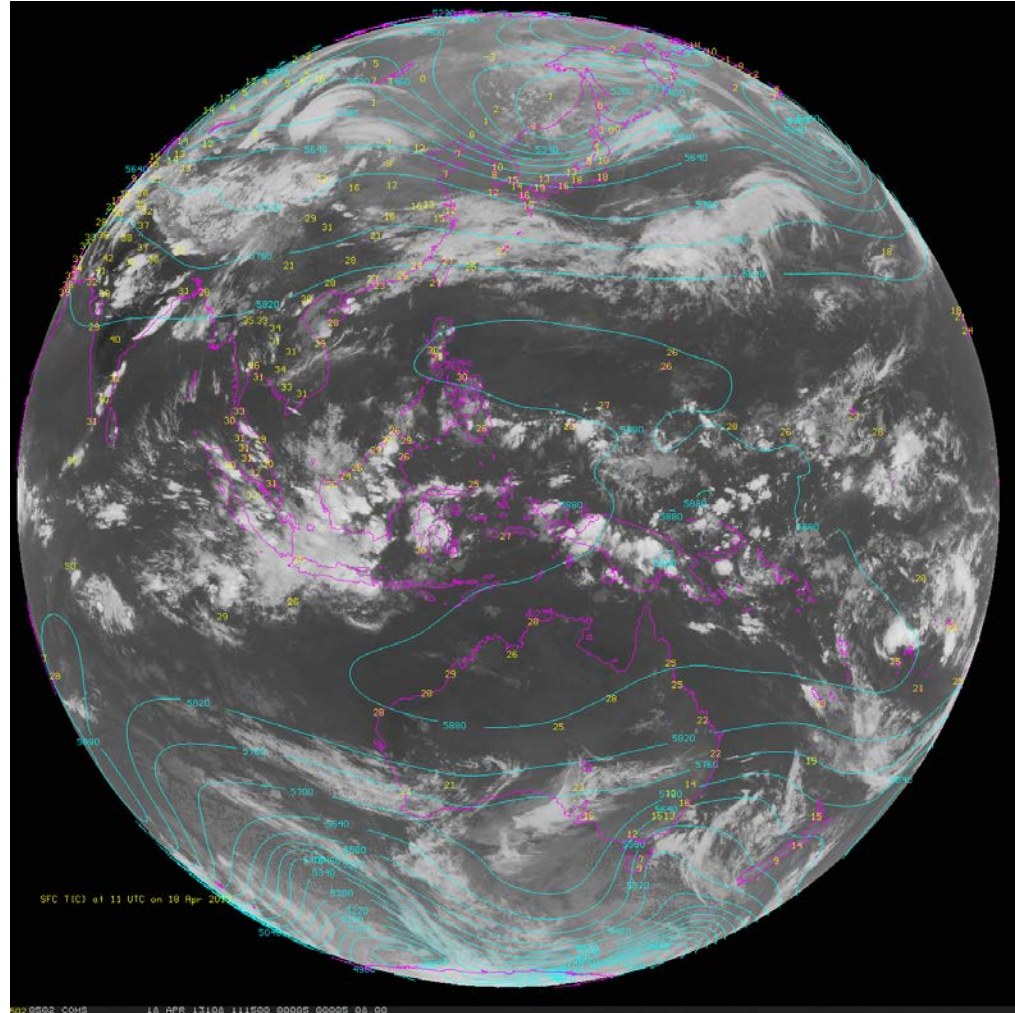
Number of reports = 17  
SFCLIST: done

IMA	GRA	Bounds	Switches	Date	Time	T
3	3	1-500		18 Apr 2013	108 14:46:57	0



# McIDAS-X

- COMS infrared image
- Yellow: METAR reports
- Cyan: 500 hPa heights from GFS model



# McIDAS-X

## Current Sites

Operational • Research • Commercial • Education

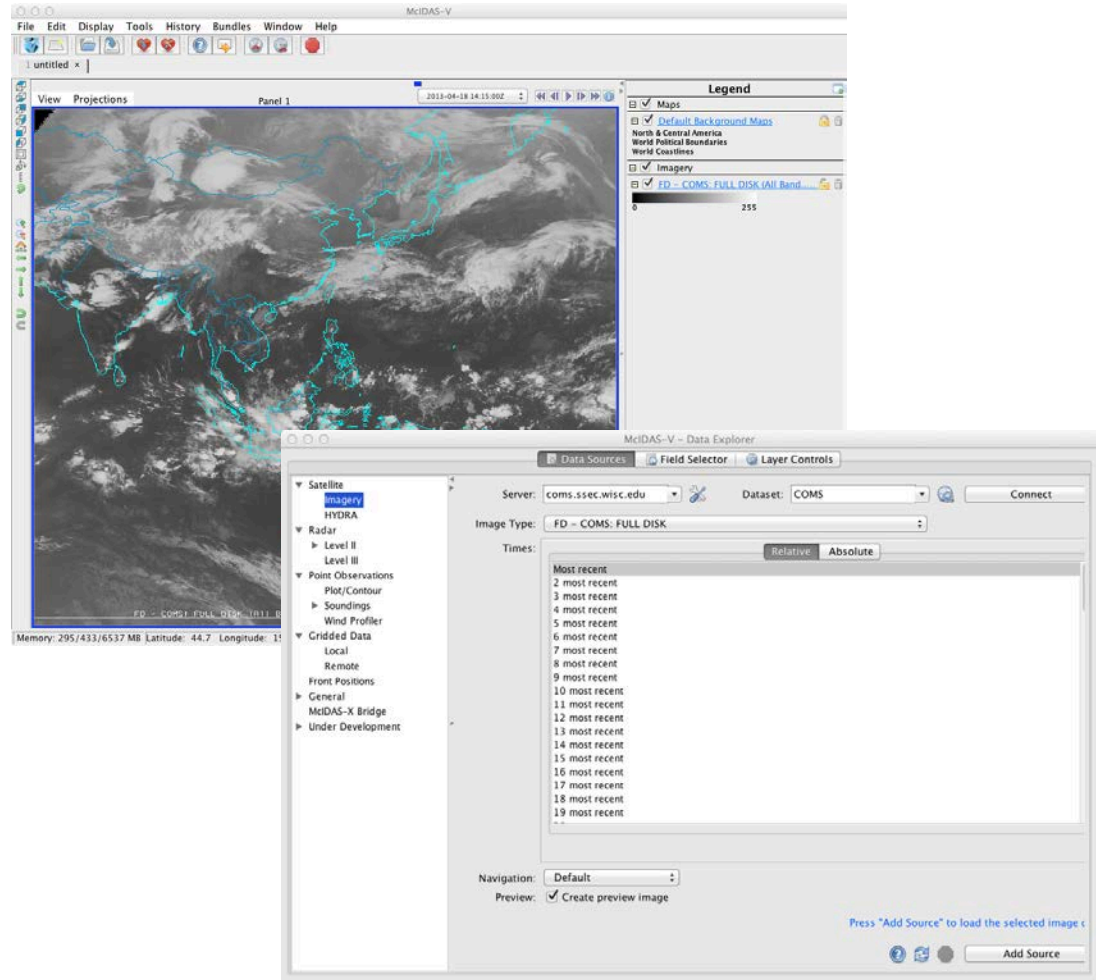
- National Weather Service Centers: NHC, AWC, SPC, NSSL, NCDC, NCEP, SMG
- International Weather Services: Spain, Australia, Mexico
- Research: NOAA, NASA, EUMETSAT
- Education: Universities throughout the US
- Commercial: Honeywell, Boeing, VTI (Japan)



# McIDAS

## McIDAS-V

- Java
- Open source
- GUI-driven
- Jython scripting
- 3D visualization





# McIDAS-V

## Current Users

- In 2012:
  - McIDAS-V was downloaded by 4600 unique IP addresses
  - McIDAS-V was launched 340,000 times
- Many research institutes
- Education (Universities worldwide)
- Real-time: EUMETCast users, Mexico weather service





# McIDAS-V Training

- Used at WMO-sponsored satellite workshop in Beijing, China in 2011 and 2012. 18 countries represented; 50 attendees
- McIDAS Users' Group meetings
- Used in international classrooms
- In-house training

# McIDAS-V Online Forums

- Report bugs
- User support
- User-to-user support
- 850 members



**McIDAS-V Support Forums**  
Support and discussion of the McIDAS-V software package  
Forum Home • McIDAS-V Home

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It is currently 10 Mar 2013, 18:36

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[Board index](#) All times are UTC

Forum		Topics	Posts	Last post
<b>General</b>				
	<b>Announcements</b> Check here first	20	27	16 Jan 2013, 19:41 mug_admin →
	<b>Under Development</b> New McIDAS-V features under development. Feedback is appreciated.	8	34	22 Aug 2012, 08:56 hproe →
<b>User Topics</b>				
	<b>General Questions</b> How do I...?	193	720	05 Mar 2013, 21:34 mug_admin →
	<b>Feature Requests</b> Post ideas for new functionality you'd like to see in McIDAS-V or ideas for new tutorials.	112	384	23 Feb 2013, 05:02 ghansham →
	<b>Bug Reports</b> Errors and unexpected results	198	882	09 Mar 2013, 10:47 hproe →
	<b>Scripting</b> Post any questions, ideas, or topics related to Jython and Python scripting.	64	323	21 Feb 2013, 13:42 tomw →
<b>User Submissions</b>				
	<b>Tips and Tricks</b> Useful hints	33	67	15 Feb 2013, 17:39 mhiley →
	<b>Bundles</b> Cool displays	7	61	16 Jan 2013, 17:25 joleenf →
	<b>Papers, Posters and Presentations</b> Share your McIDAS-V presentations here and have them listed on the McIDAS-V Webpage. - <a href="http://www.ssec.wisc.edu/mcidas/software/...ences.html">http://www.ssec.wisc.edu/mcidas/software/...ences.html</a>  (If the file size exceeds the size limits of the forum, please create a forum post and upload the file via anonymous ftp to <a href="ftp://ftp.ssec.wisc.edu/pub/incoming">ftp://ftp.ssec.wisc.edu/pub/incoming</a> )	13	28	29 Jan 2013, 15:10 joleenf →

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# McIDAS-V

## Documentation/Tutorials

### Documents

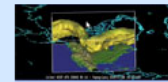
**McIDAS-V User's Guide** [HTML](#) | [PDF](#)

#### Tutorials

- ★ Installation and Introduction [PDF](#) | [Data](#) [18 MB]
- Satellite Imagery [PDF](#) | [Data](#) [1264 MB]
- Polar Satellite Imagery [PDF](#) | [Data](#) [524 MB]
- Hyperspectral Data [PDF](#) | [Data](#) [198 MB]
- Simulated ABI Data [PDF](#) | [Data](#) [443 MB]
- McIDAS-X Bridge [PDF](#) | [Data](#)
- Level II Radar Imagery [PDF](#) | [Data](#) [24 MB]
- Point Observations using ADDE [PDF](#) | [Data](#) [0.6 MB]
- Point Observations using netCDF [PDF](#) | [Data](#) [6 MB]
- Gridded Data [PDF](#) | [Data](#) [459 MB]
- Importing Text Files [PDF](#) | [Data](#) [0.6 MB]
- Basic Formulas [PDF](#) | [Data](#) [200 MB]
- Basic Scripting [PDF](#) | [Data](#) [20 MB]

**Note:** Tutorials with a size (e.g., [18 MB]) after their *Data* link are ones that are updated for McIDAS-V 1.2 and whose *Data* link downloads a zipped file containing all of the data files used in the tutorial.

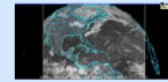
### Instructional Videos



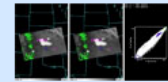
[Introduction](#)  
(2:16 min)



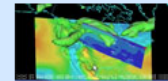
[Controls and Preferences](#)  
(3:40 min)



[Bundles](#)  
(1:40 min)



[Creating a Scatter Analysis](#)  
(3:12 min)



[Isosurface and Cross-Section Display over Topography](#)  
(3:39 min)

[Submit ideas for new videos](#)

# IMAPP & CSPP Products

## Terra and Aqua

- MODIS (1KM, HKM, QKM)
- AIRS

## Suomi NPP and JPSS series

- VIIRS SDRs and EDRs
- Cross-track Infrared Sounder (CrIS)
- Advanced Technology Microwave Sounder (ATMS)



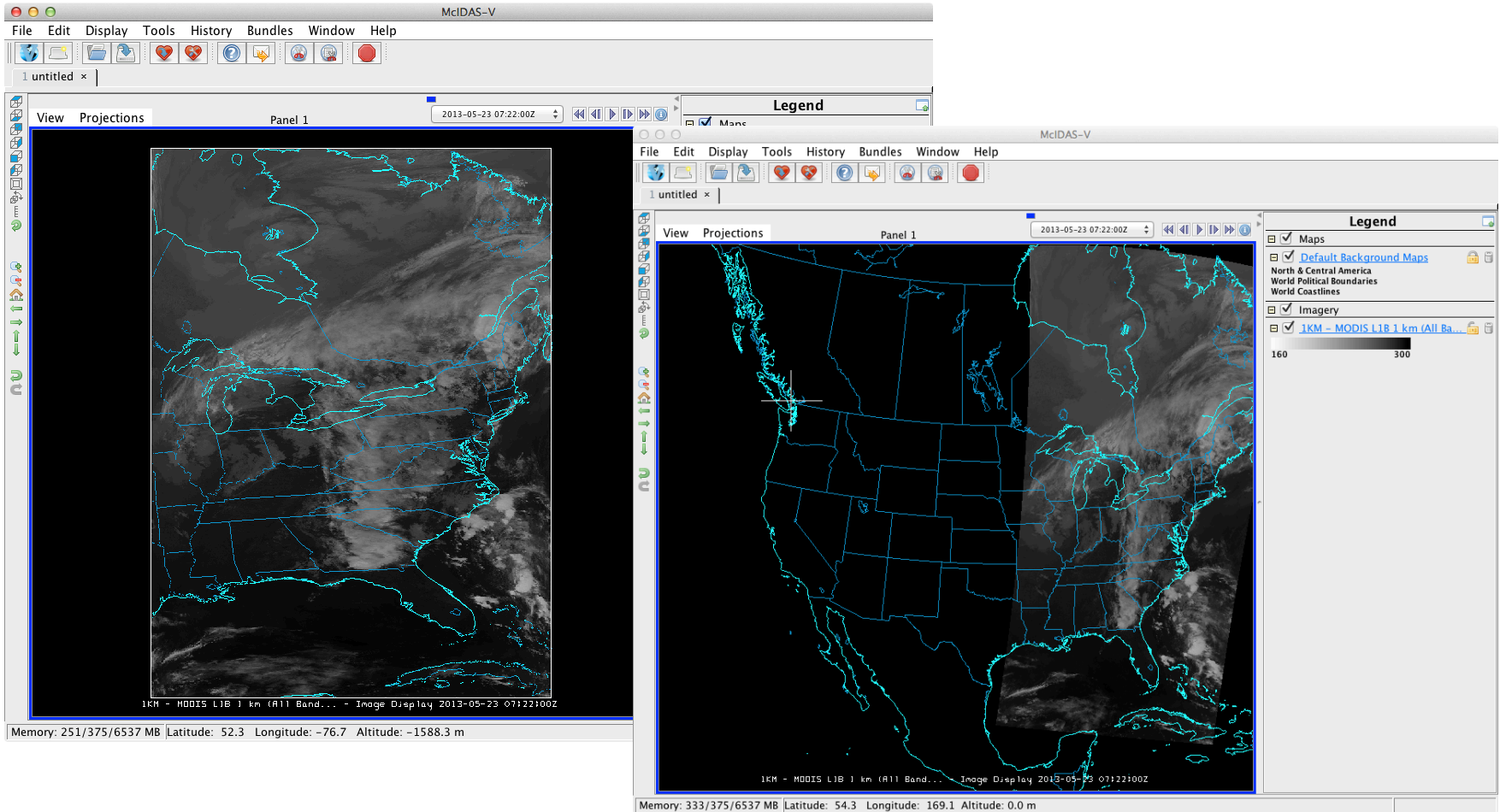
# IMAPP Products

## MODIS

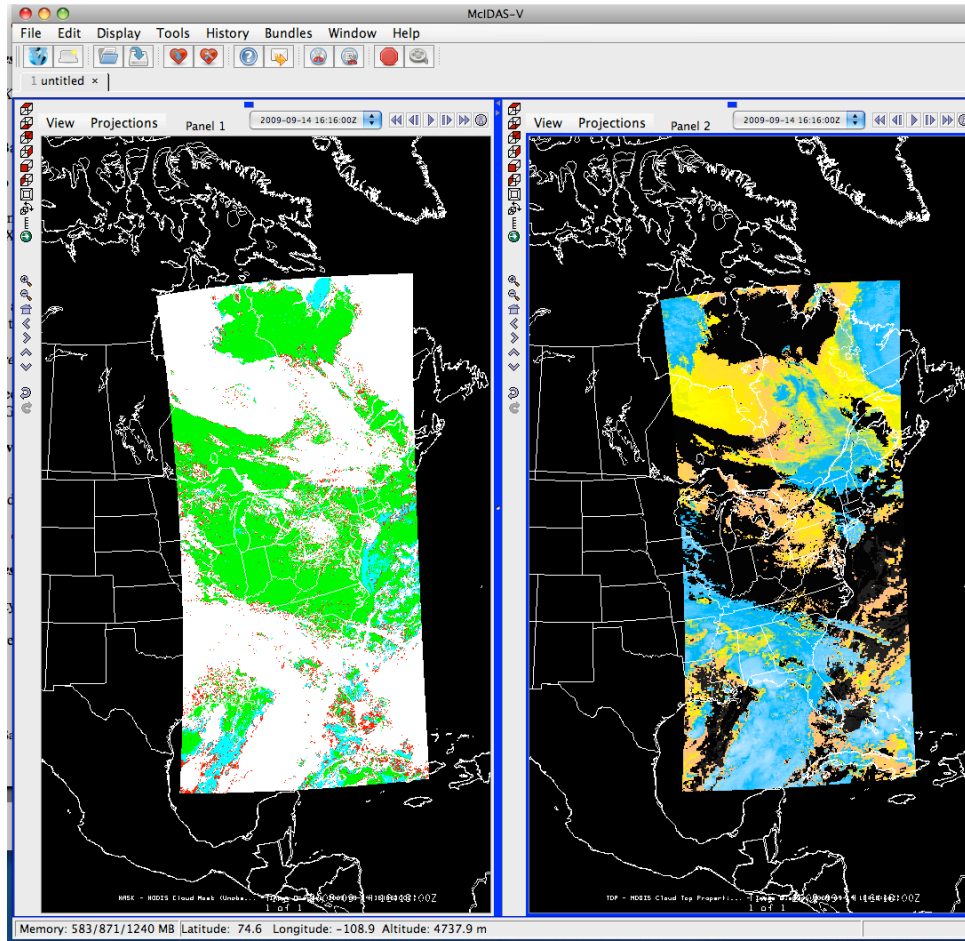
- MOD02: Level 1b
- MOD04: Aerosol
- MOD06: Cloud products
- MOD07: Atmospheric profiles
- MOD28: SST
- MOD35: Cloud mask



# MODIS Level 1b



# MODIS Products



Cloud Mask

Cloud Top Pressure



# VIIRS Cloud Mask Variables

McIDAS-V - Data Explorer

Data Sources | Field Selector | Layer Controls

Data Sources:  
Formulas  
VIIRS 2013-04-16 08:19:56

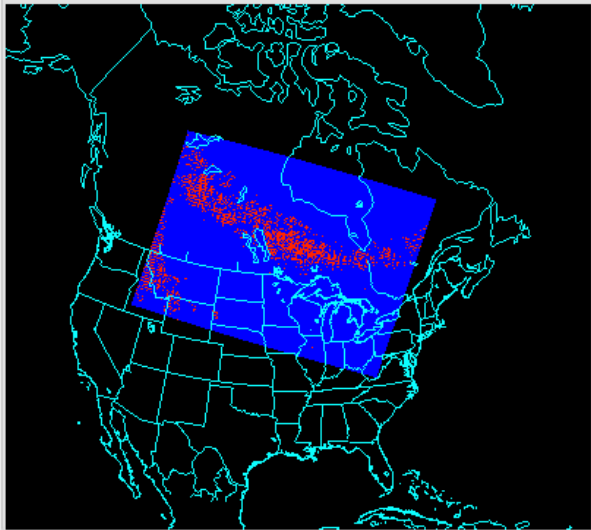
Fields

- IMAGE
  - VIIRS-CM-IP\_All/Adjacent\_Pixel\_Cloud\_Confidence\_Pixel
  - VIIRS-CM-IP\_All/Cirrus
  - VIIRS-CM-IP\_All/Cirrus\_IR
  - VIIRS-CM-IP\_All/Cloud\_Detection\_and\_Confidence\_Pixel
  - VIIRS-CM-IP\_All/Cloud\_Mask\_Quality\_Pixel
  - VIIRS-CM-IP\_All/Cloud\_Phase
  - VIIRS-CM-IP\_All/Conifer\_Boreal\_Forest**
  - VIIRS-CM-IP\_All/DayNight\_Pixel
  - VIIRS-CM-IP\_All/Degraded\_Polar\_Night
  - VIIRS-CM-IP\_All/Degraded\_Sun\_Glint\_in\_Pixel
  - VIIRS-CM-IP\_All/Degraded\_TOC\_NDVI
  - VIIRS-CM-IP\_All/Dust\_Candidate
  - VIIRS-CM-IP\_All/Dust\_or\_Volcanic\_Ash\_is\_present
  - VIIRS-CM-IP\_All/Ephemeral\_Water\_Detected
  - VIIRS-CM-IP\_All/Fire\_Detected
  - VIIRS-CM-IP\_All/High\_Cloud
  - VIIRS-CM-IP\_All/IR\_Temperature\_Difference\_Test\_BTM14-BT
  - VIIRS-CM-IP\_All/IR\_Threshold\_Cloud\_Test\_BTM15
  - VIIRS-CM-IP\_All/LandWater\_Background\_Pixel
  - VIIRS-CM-IP\_All/Non\_Cloud\_Obstruction
  - VIIRS-CM-IP\_All/QF1\_VIIRSCMIP
  - VIIRS-CM-IP\_All/QF2\_VIIRSCMIP
  - VIIRS-CM-IP\_All/QF3\_VIIRSCMIP
  - VIIRS-CM-IP\_All/QF4\_VIIRSCMIP
  - VIIRS-CM-IP\_All/QF5\_VIIRSCMIP
  - VIIRS-CM-IP\_All/QF6\_VIIRSCMIP
  - VIIRS-CM-IP\_All/Shadow\_Detected\_Pixel
  - VIIRS-CM-IP\_All/Smoke\_Candidate
  - VIIRS-CM-IP\_All/SnowIce\_Surface\_Pixel
  - VIIRS-CM-IP\_All/Spatial\_Uniformity\_Test\_Pixel

Displays

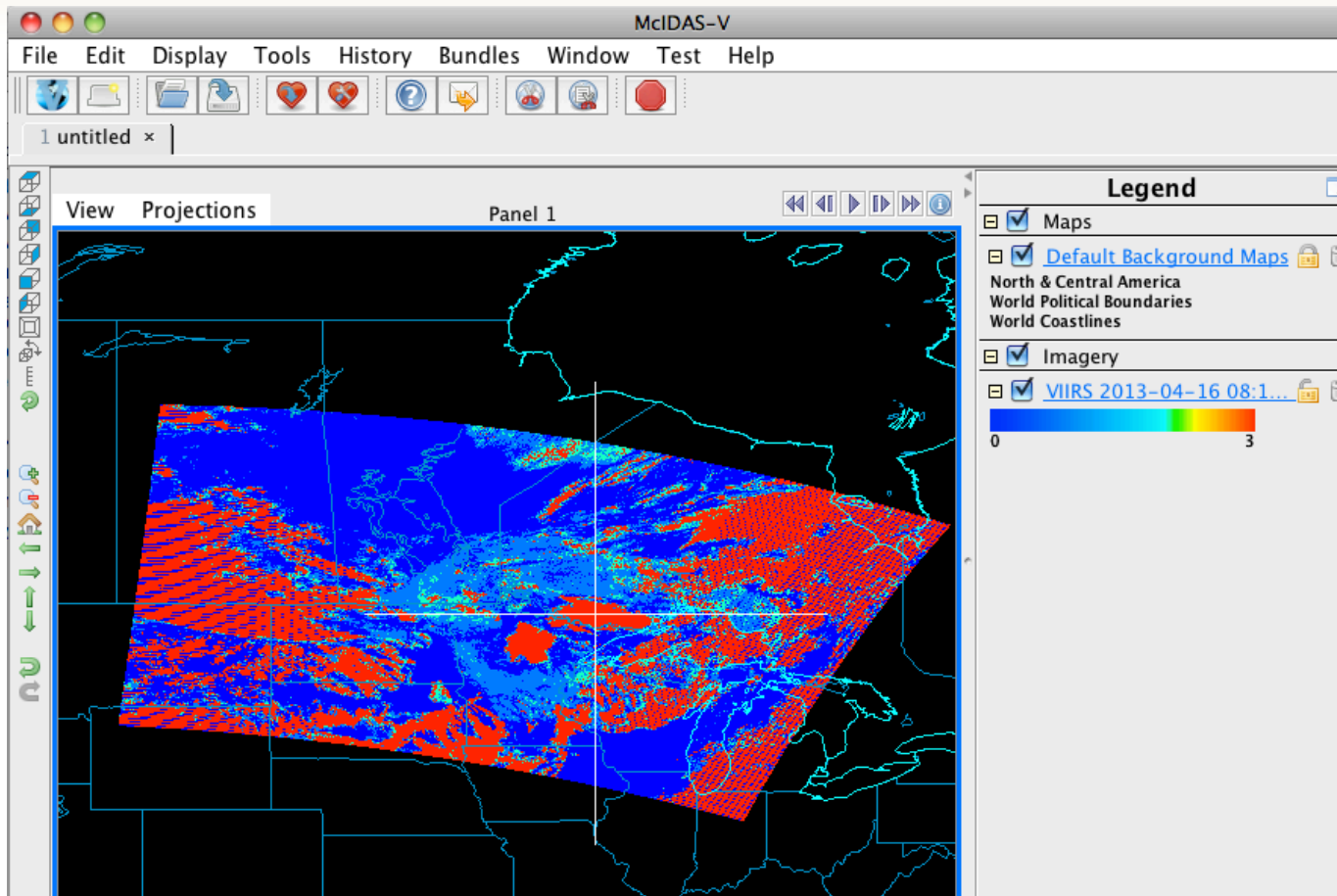
- Imagery
  - Image Display**
  - Image Display Over Topography
  - Image Sequence Display
  - 3 Color (RGB) Image
  - 3 Color (RGB) Image over topography
  - MultiSpectral Display
  - ProfileAlongTrack Display

Region



Create Display

# VIIRS Cloud Mask Data Probe

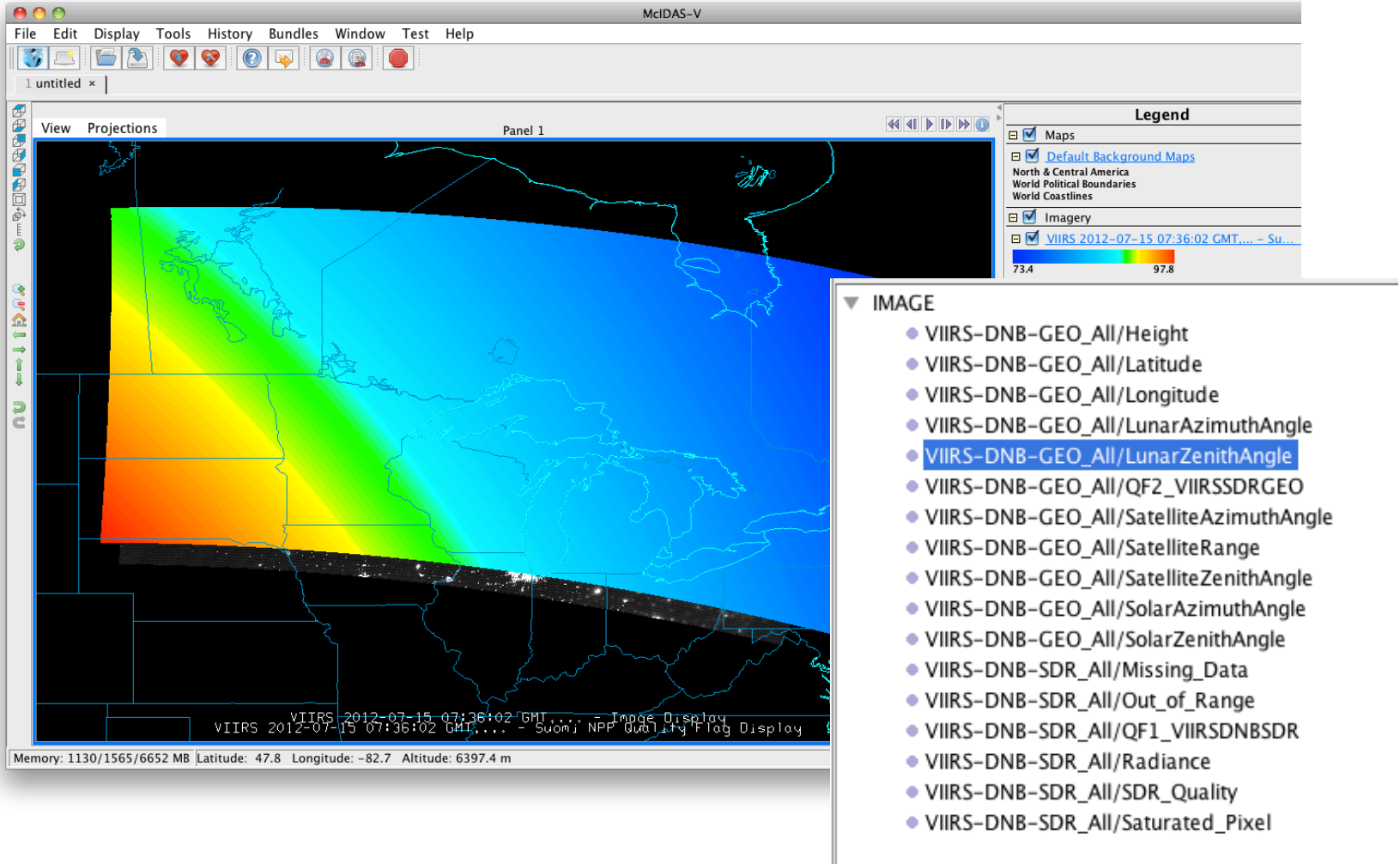


Location: Lat: 48.64 Lon: -91.41

VIIRS 2013-04-16 08:19:56 GMT,... - Suomi NPP Quality Flag Display:

Confidently Cloudy

# Any Geolocated Data Accessible



McIDAS-V

File Edit Display Tools History Bundles Window Test Help

1 untitled x

View Projections Panel 1

Legend

- Maps
  - Default Background Maps
    - North & Central America
    - World Political Boundaries
    - World Coastlines
  - Imagery
    - VIIRS 2012-07-15 07:36:02 GMT... - Su...

73.4 97.8

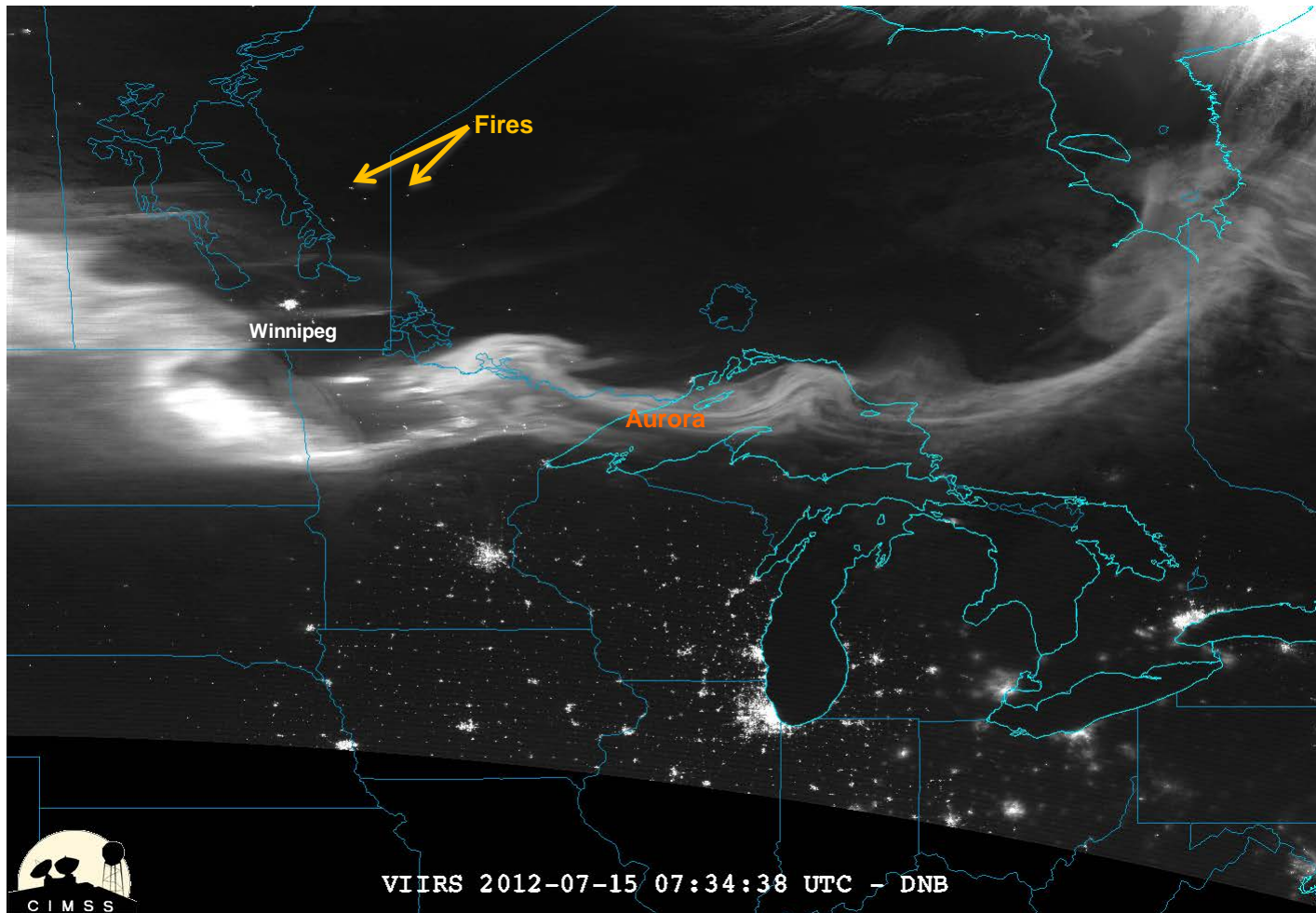
IMAGE

- VIIRS-DNB-GEO\_All/Height
- VIIRS-DNB-GEO\_All/Latitude
- VIIRS-DNB-GEO\_All/Longitude
- VIIRS-DNB-GEO\_All/LunarAzimuthAngle
- **VIIRS-DNB-GEO\_All/LunarZenithAngle**
- VIIRS-DNB-GEO\_All/QF2\_VIIRSSDRGEO
- VIIRS-DNB-GEO\_All/SatelliteAzimuthAngle
- VIIRS-DNB-GEO\_All/SatelliteRange
- VIIRS-DNB-GEO\_All/SatelliteZenithAngle
- VIIRS-DNB-GEO\_All/SolarAzimuthAngle
- VIIRS-DNB-GEO\_All/SolarZenithAngle
- VIIRS-DNB-SDR\_All/Missing\_Data
- VIIRS-DNB-SDR\_All/Out\_of\_Range
- VIIRS-DNB-SDR\_All/QF1\_VIIRSDNBSDR
- VIIRS-DNB-SDR\_All/Radiance
- VIIRS-DNB-SDR\_All/SDR\_Quality
- VIIRS-DNB-SDR\_All/Saturated\_Pixel

VIIRS 2012-07-15 07:36:02 GMT... - Image Display  
VIIRS 2012-07-15 07:36:02 GMT... - Suomi NPP Quality Flag Display

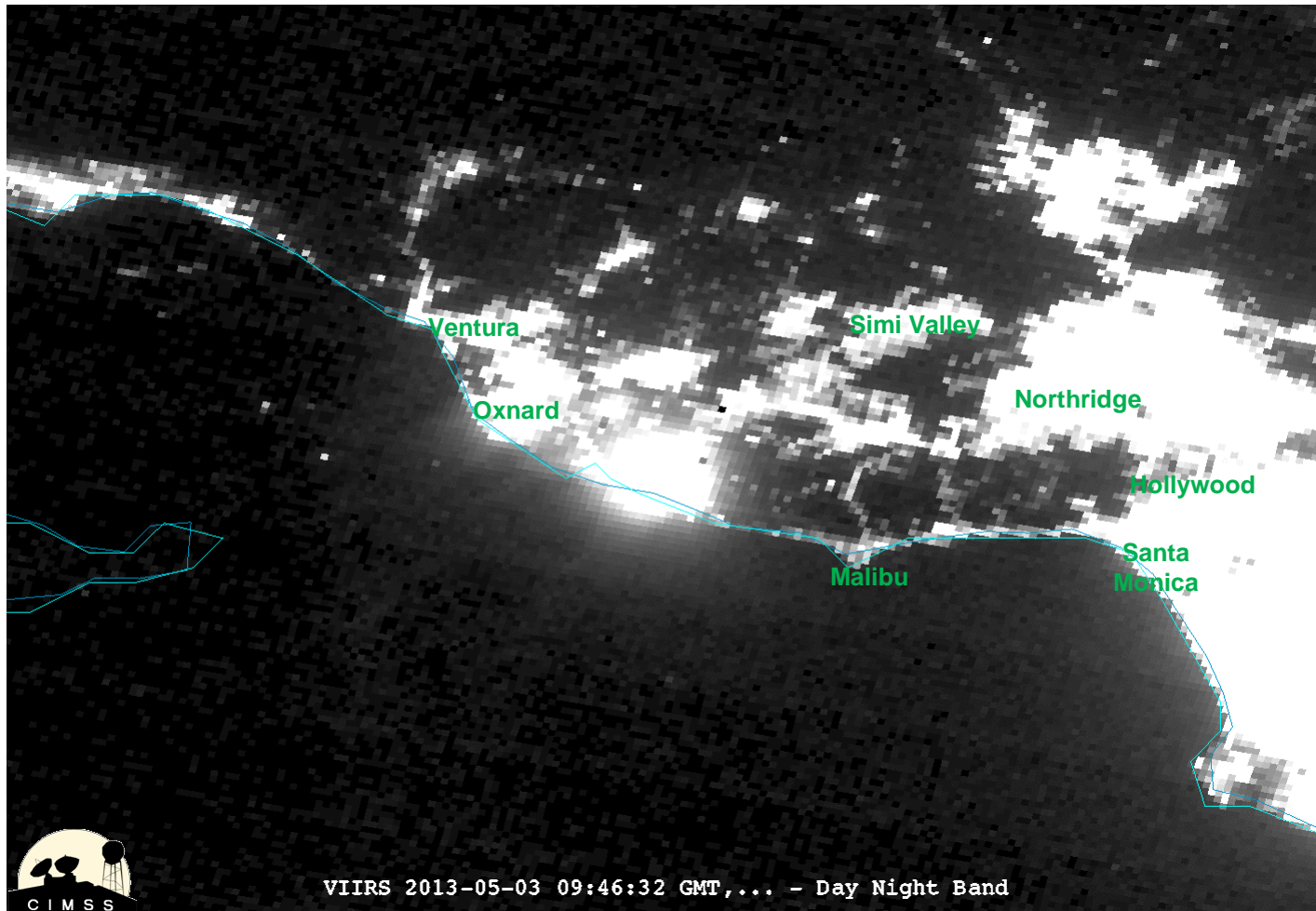
Memory: 1130/1565/6652 MB Latitude: 47.8 Longitude: -82.7 Altitude: 6397.4 m

# Aurora from VIIRS DNB

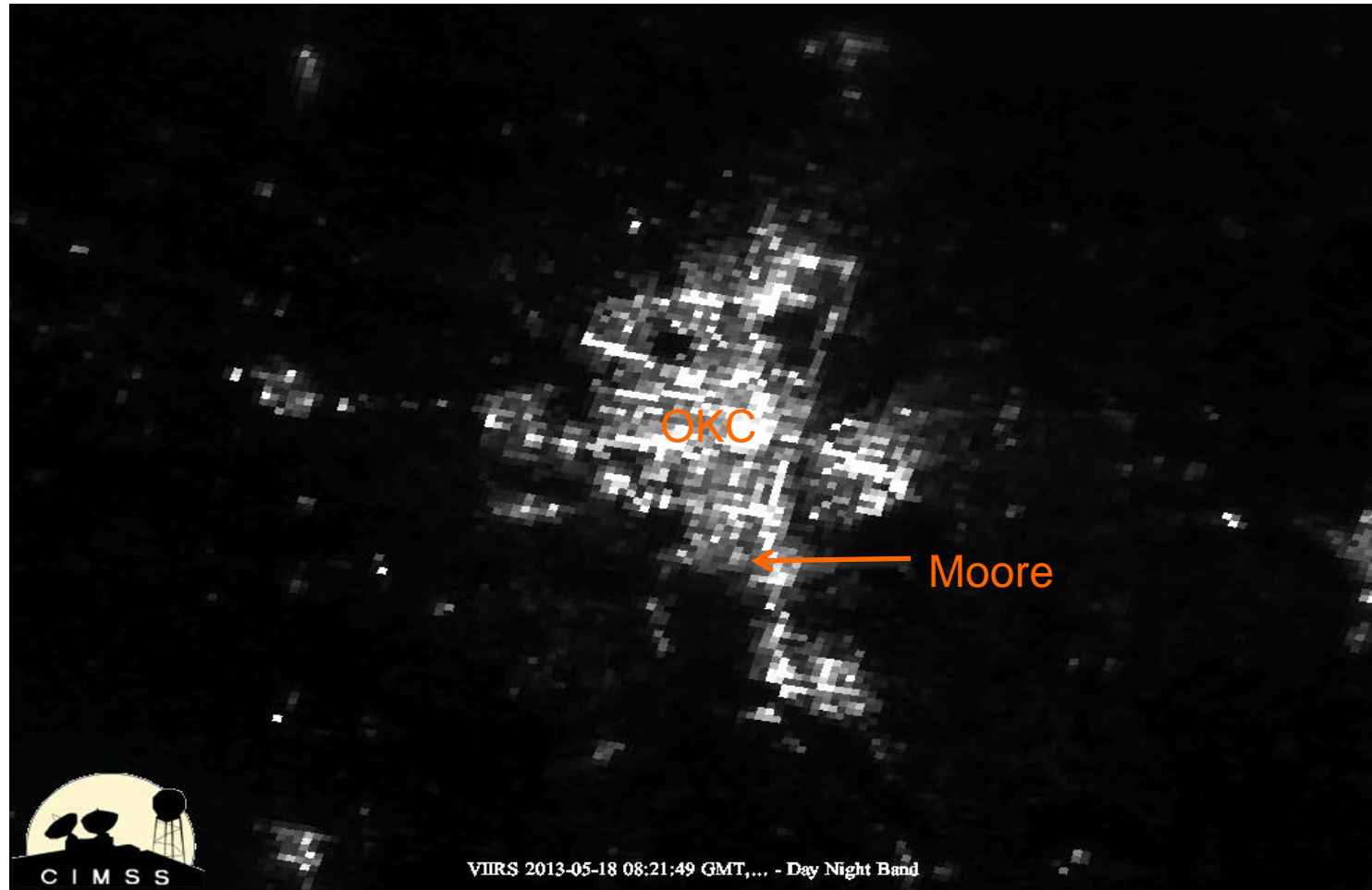




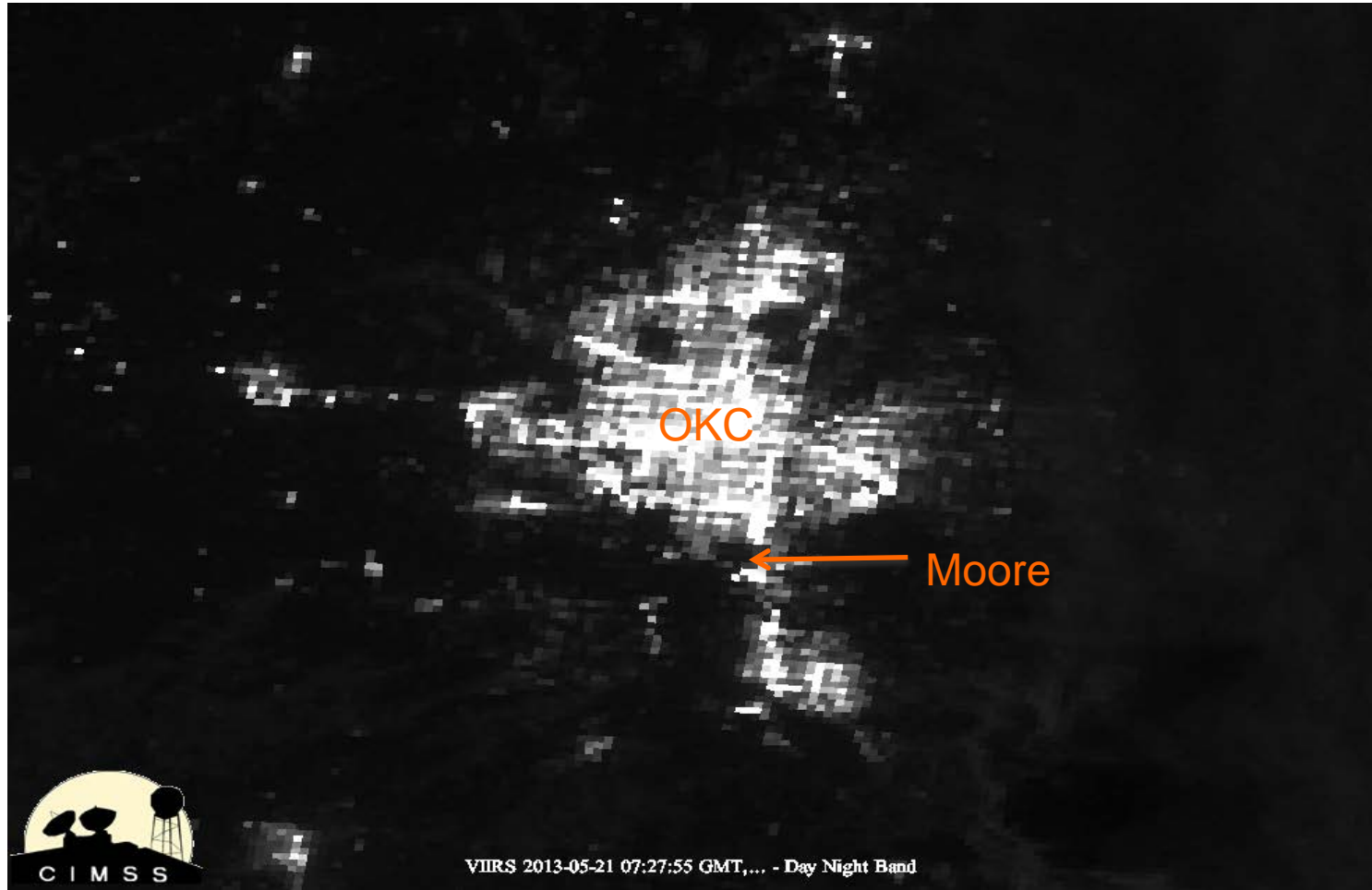
# Fire from VIIRS DNB



# VIIRS Imagery DNB

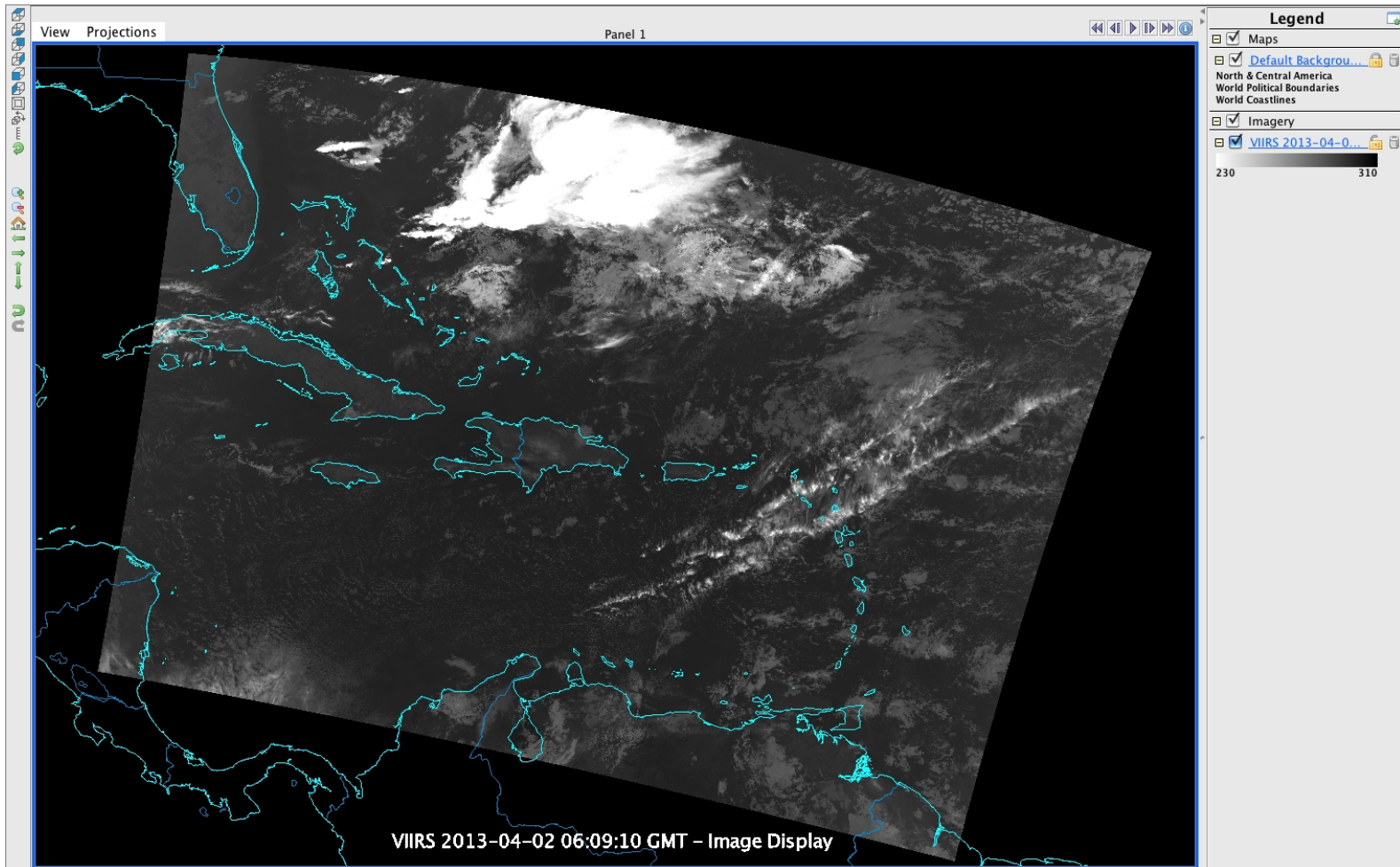


# VIIRS Imagery DNB

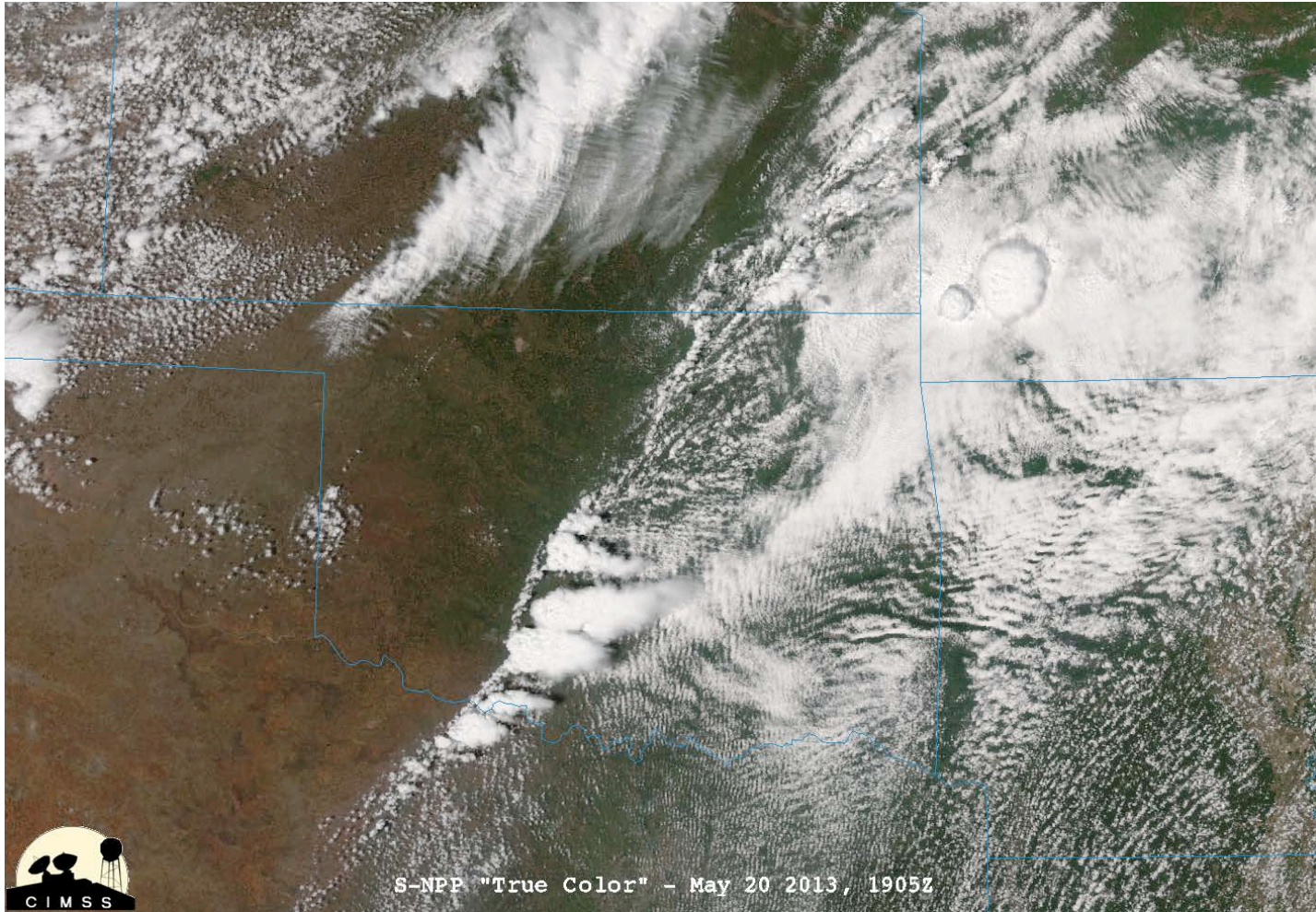




# VIIRS Imagery EDR

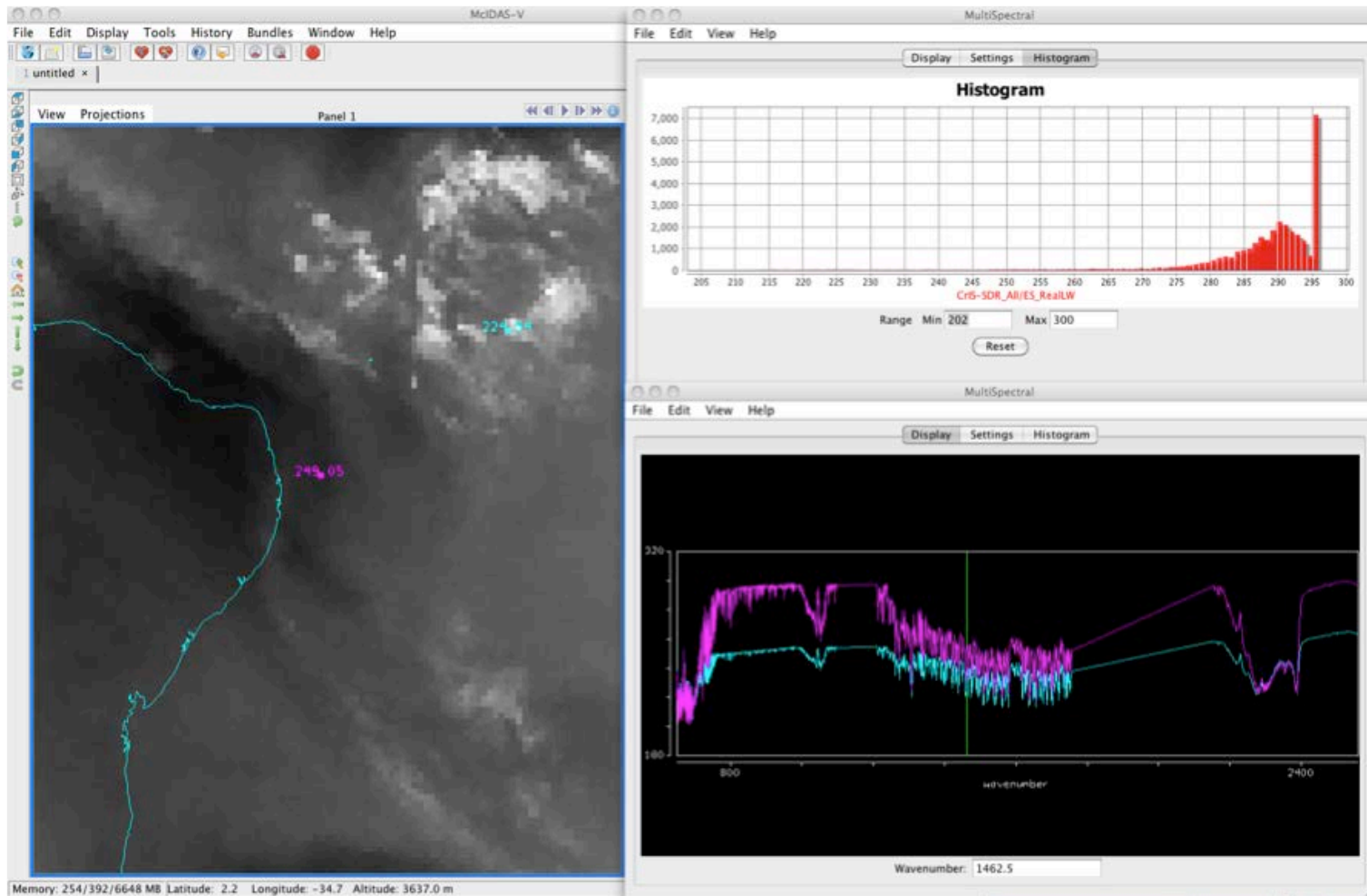


# VIIRS Imagery True Color

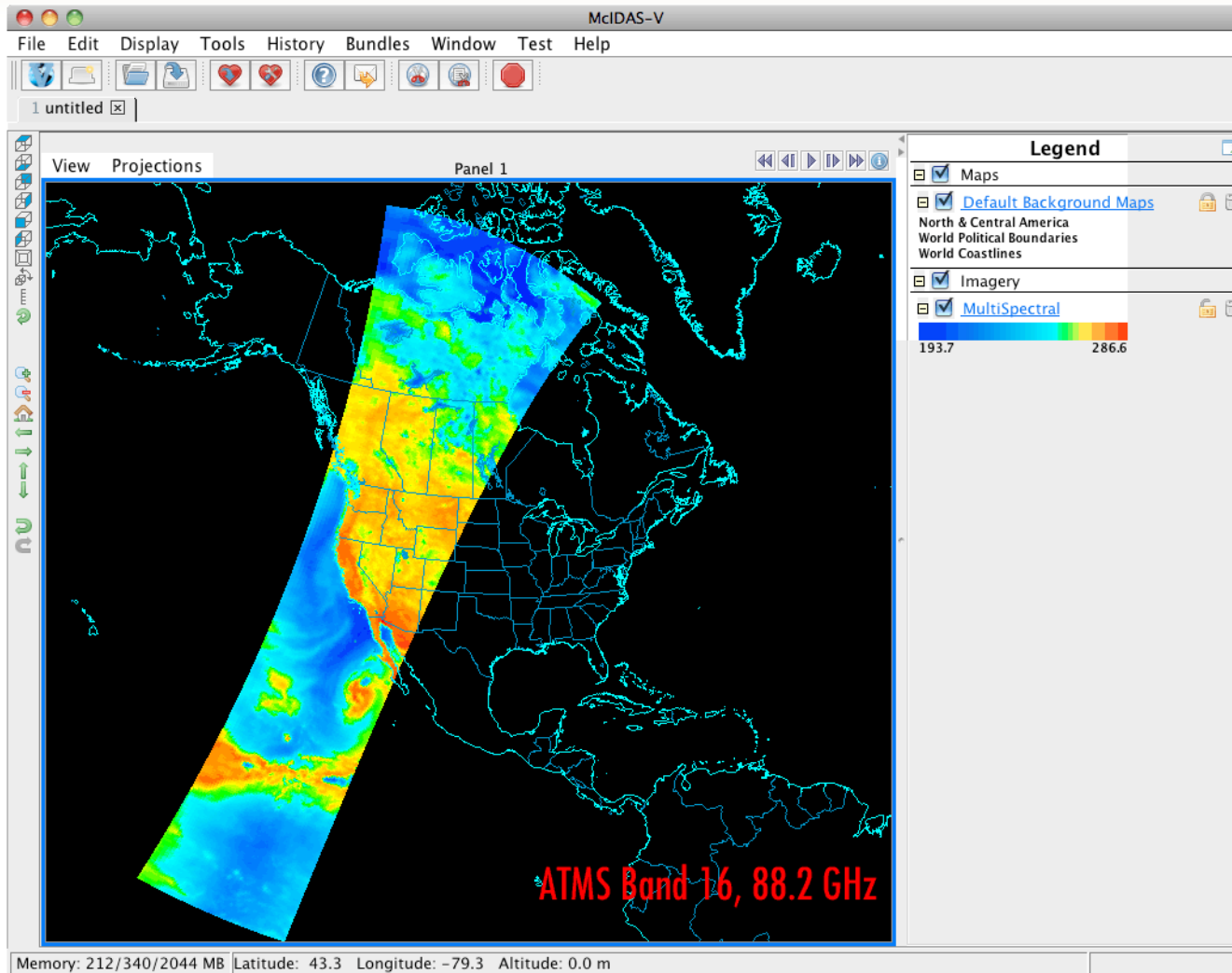




# CrIS



# ATMS



# McIDAS-V

## Other capabilities

Freely available real-time data

- Global geostationary satellite data (NOAA)
- Model grids from NOAAPORT
- Observations and vertical profiles from NOAAPORT

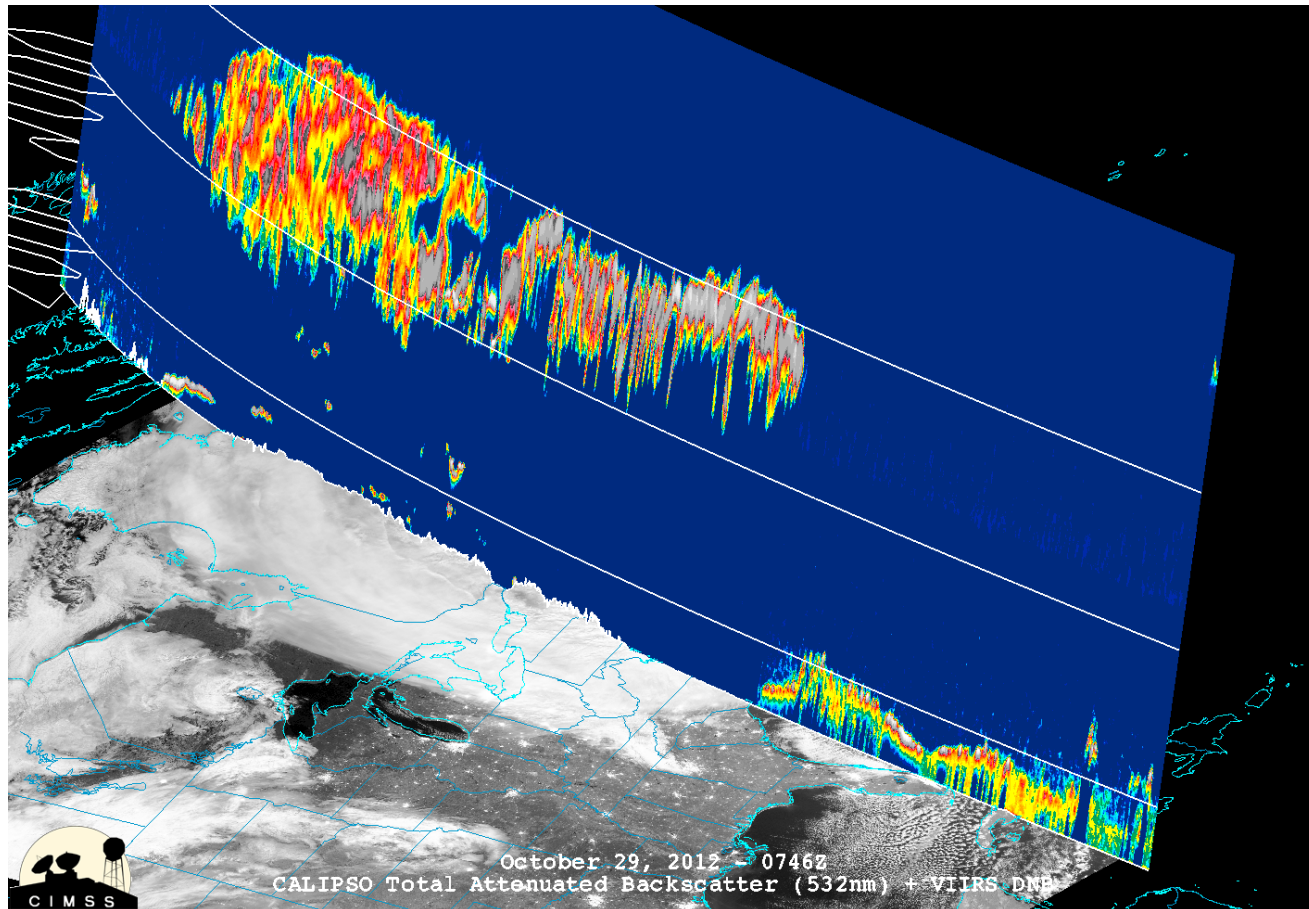
Display data from text files, netCDF, HDF, GRIB, BUFR, binary files, radar, AVHRR Level 1b

HYDRA functionality





# DNB from CSPP CALIOP Backscatter





# McIDAS-V Status

- McIDAS-V version 1.3
  - Available by early June 2013
  - Visualize the IMAPP and CSPP products discussed in this presentation, except for the EDRs.

Search: mcidas-v

<http://www.ssec.wisc.edu/mcidas/software/v/>

dave.santek@ssec.wisc.edu

