Usage of McIDAS-V with GOES-R AWG products

William Straka III
UW/CIMSS
Madison, Wisconsin, USA

With help from Tom Rink (CIMSS/SSEC), Tom Achtor (CIMSS/SSEC), and Tim Schmit (NOAA/NESDIS)

Acknowledgements

We would like to acknowledge the efforts of several people in providing the data from the GOES-R AIT framework for testing

Walter Wolf[1], Shanna Sampson[2], Qingzhao Guo[2], Gang Fu[2], Aiwu Li[2], Meizhu Fan[2], Shuang Qiu[2], Zhaohui Cheng[2]

[1] NOAA/NESDIS/STAR
[2]IMSG/Dell

In addition, we would like to acknowledge the GOES-R AWG teams who created these algorithms, EUMETSAT for the SEVIRI data and NASA EOS for the MODIS data.

Further thanks goes to the GOES-R Imagery AWG for providing the simulated AWG data and to Tom Rink for implementing the GOES-R Fixed Grid Format in to McIDAS-V

Status of GOES-R product Visualization in McIDAS-V

- Currently all of the 80% code delivery ABI Baseline Products are able to be visualized in McIDAS-V

- As files from the 100% code delivery become available for the Baseline products, the output is being tested and visualized in McIDAS-V. The Option 2 products, which are at their 80% code delivery are also being tested as they become available. Comments on any issues are then sent back to the GOES-R AIT

- McIDAS-V can visualize simulated ABI data in the GOES-R Fixed Grid Format

Status of GOES-R product Visualization in McIDAS-V

- A request was sent in December 2010 to the GOES-R AWG teams to gather enhancements for the various products.

- As they become available, the enhancements are tested and passed along to the McIDAS-V team for integration into McIDAS-V.

- The status of what enhancements have been integrated in available online to both the AIT as well as McIDAS-V teams

ABI/GLM GOES-R product List

BASELINE Products

Advanced Baseline Imager (ABI)

- Clouds and Moisture Imagery (KPP)
- Clear Sky Mask
- Cloud Top Pressure and Height
- Cloud Top Phase
- Cloud Top Temperature
- Cloud Particle Size Distribution
- Cloud Optical Path
- Temperature and Moisture Profiles
- Total Precipitable Water
- Stability Parameters (Lifted Index)
- Aerosol Detection
- Aerosols Optical Depth
- Derived Motion Winds
- Hurricane Intensity
- Fire/Hot Spot Characterization
- Land and Sea Surface Temperature
- Volcanic Ash
- Rainfall Rate
- Snow Cover
- Downward Solar Insolation: Surface
- Reflected Solar Insolation: TOA

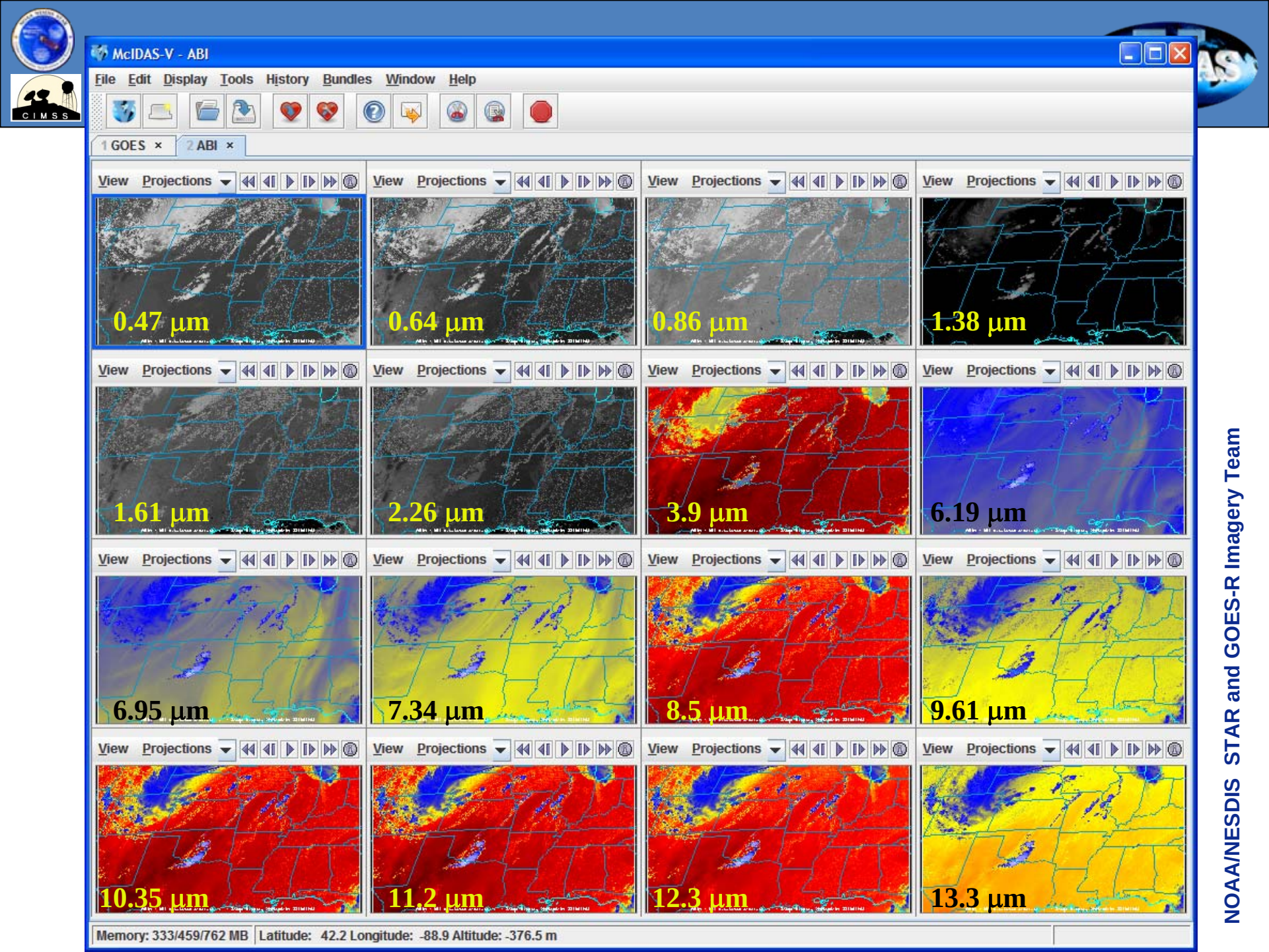
GLM

- Lightning Detection

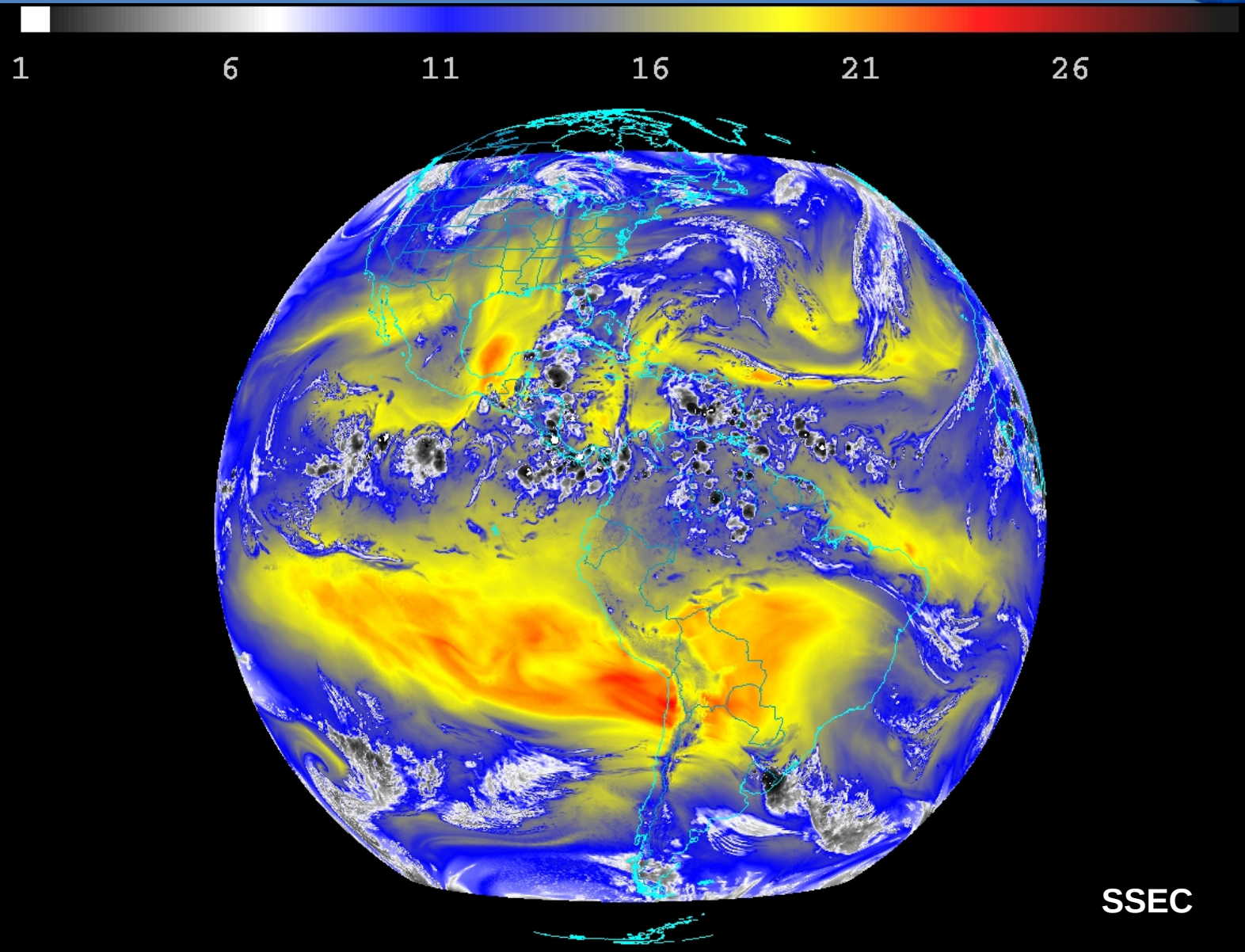
OPTION 2 Products

Advanced Baseline Imager (ABI)

- Cloud Layer/Heights
- Cloud Ice Water Path
- Cloud Liquid Water
- Cloud Type
- Convective Initiation
- Turbulence
- Low Cloud and Fog
- Enhanced “V”/Overshooting Top
- Aircraft Icing Threat
- SO_2 Detections (Volcanoes)
- Visibility
- Upward Longwave Radiation (TOA)
- Downward Longwave Radiation (SFC)
- Upward Longwave Radiation (SFC)
- Total Ozone
- Aerosol Particle Size
- Surface Emissivity
- Surface Albedo
- Vegetation Index
- Vegetation Fraction
- Flood Standing Water
- Rainfall probability and potential
- Snow Depth
- Ice Cover
- Sea & Lake Ice Concentration, Age, Extent, Motion
- Ocean Currents, Currents: Offshore

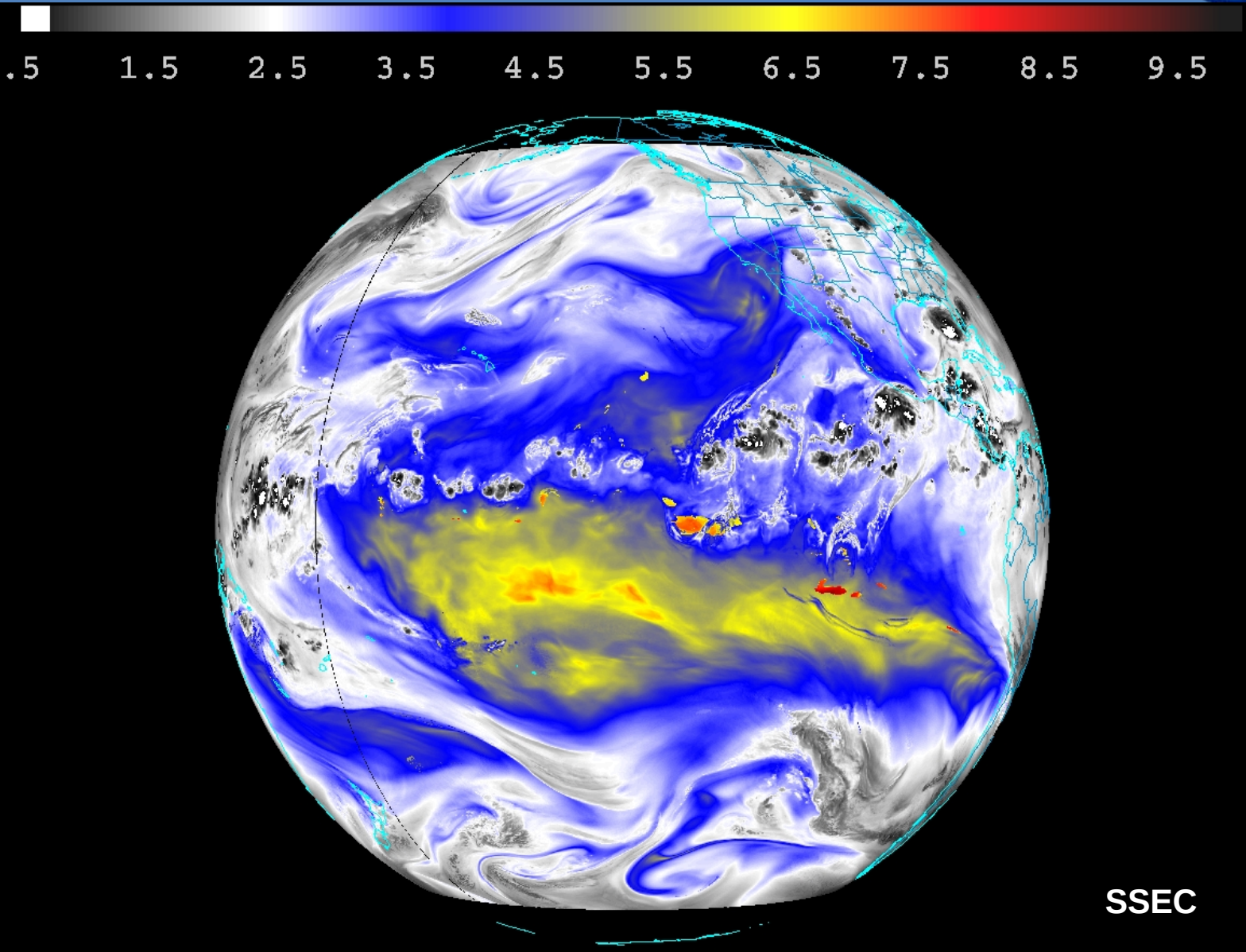

McIDAS-V - ABI
File Edit Display Tools History Bundles Window Help
1 GOES
2 ABI
View Projections
0.47 µm
0.64 µm
0.86 µm
1.38 µm
1.61 µm
2.26 µm
3.9 µm
6.19 µm
6.95 µm
7.34 µm
8.5 µm
9.61 µm
10.35 µm
11.2 µm
12.3 µm
13.3 µm
Memory: 333/459/762 MB
Latitude: 42.2 Longitude: -88.9 Altitude: -376.5 m
NOAA/NESDIS STAR and GOES-R Imagery Team

GOES-R East (Simulated), FGF w/ lats included
75 W



WRF Simulation - 7.4 um Radiance - GOES-R EAST (75W)

GOES-R West (Simulated), FGF w/ lats included
137 W



WRF Simulation - 6.15 um Radiance - GOES-R WEST (137W)

Simulated GOES-R Displayed in Google Earth

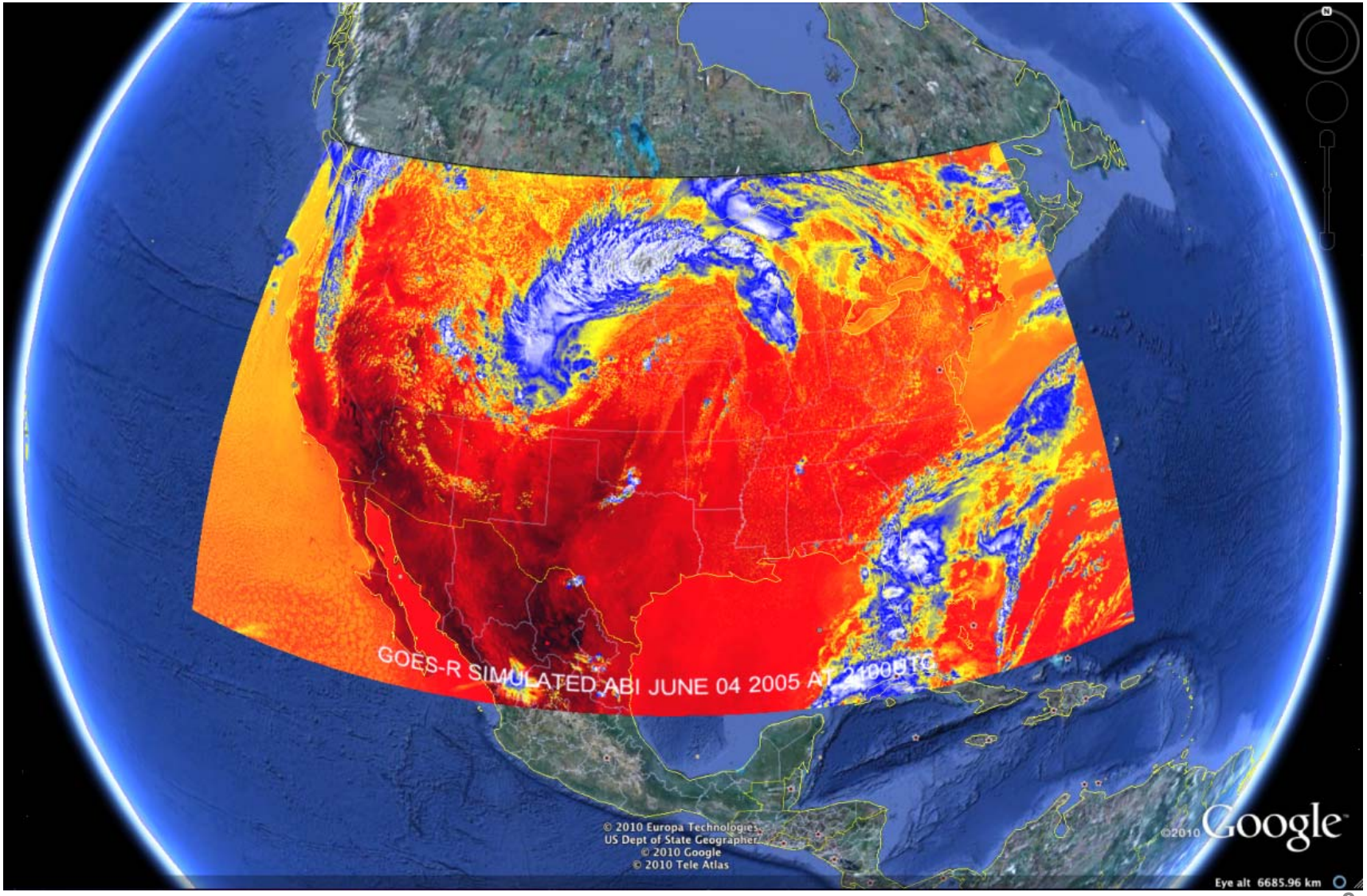


Image courtesy of NOAA/NESDIS STAR and GOES-R Imagery Team, Kaba Bah (CIMSS/SSEC)

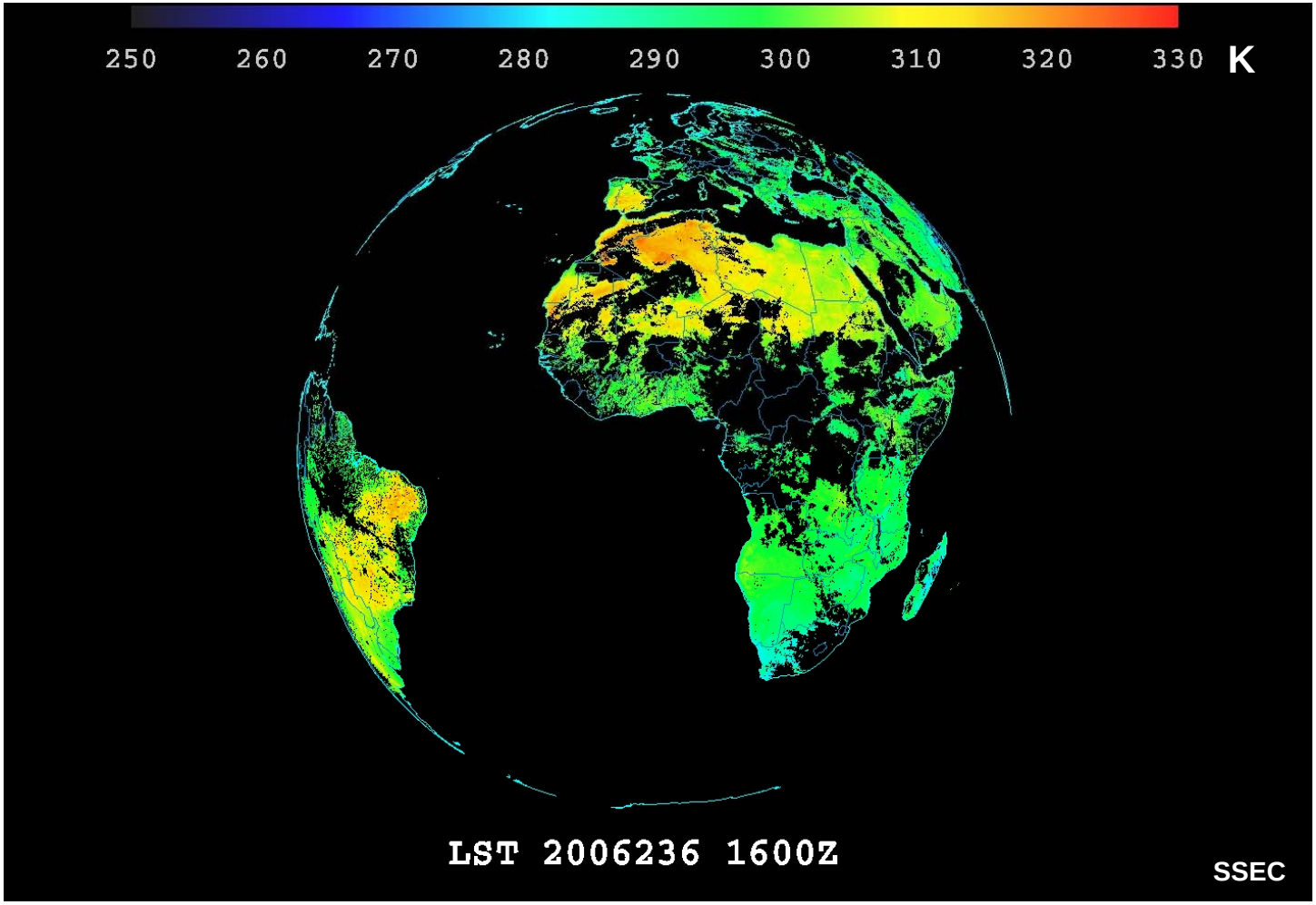
GOES-R product images

- Most of the GOES-R products have been using SEVIRI as a proxy dataset . Others have used MODIS or simulated data as a proxy data

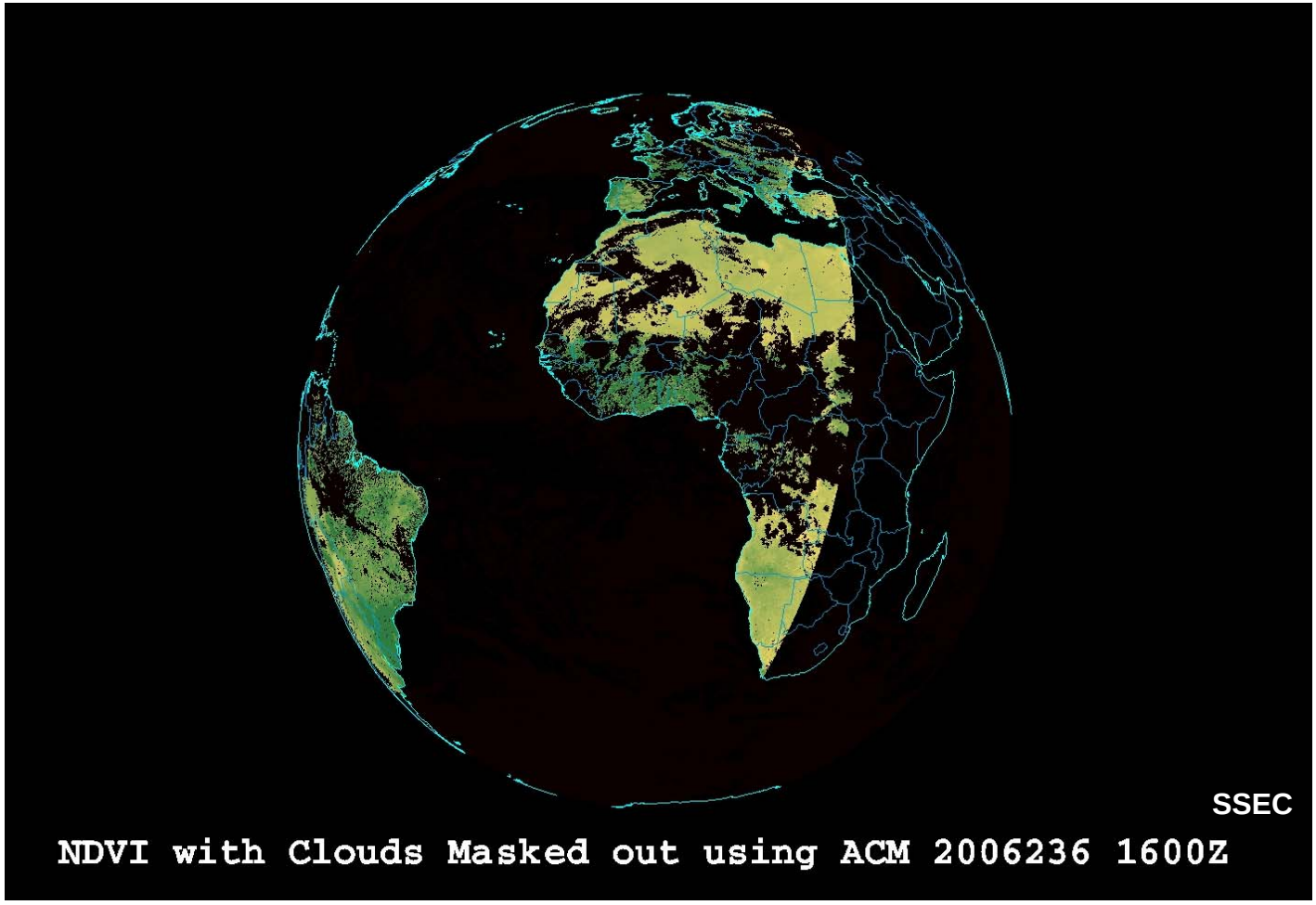
- The following images show products either from the Framework runs of from PG efforts in order to demonstrate the enhancements and abilities of McIDAS-V

- Unless otherwise noted, all images use data from the 80% code delivery

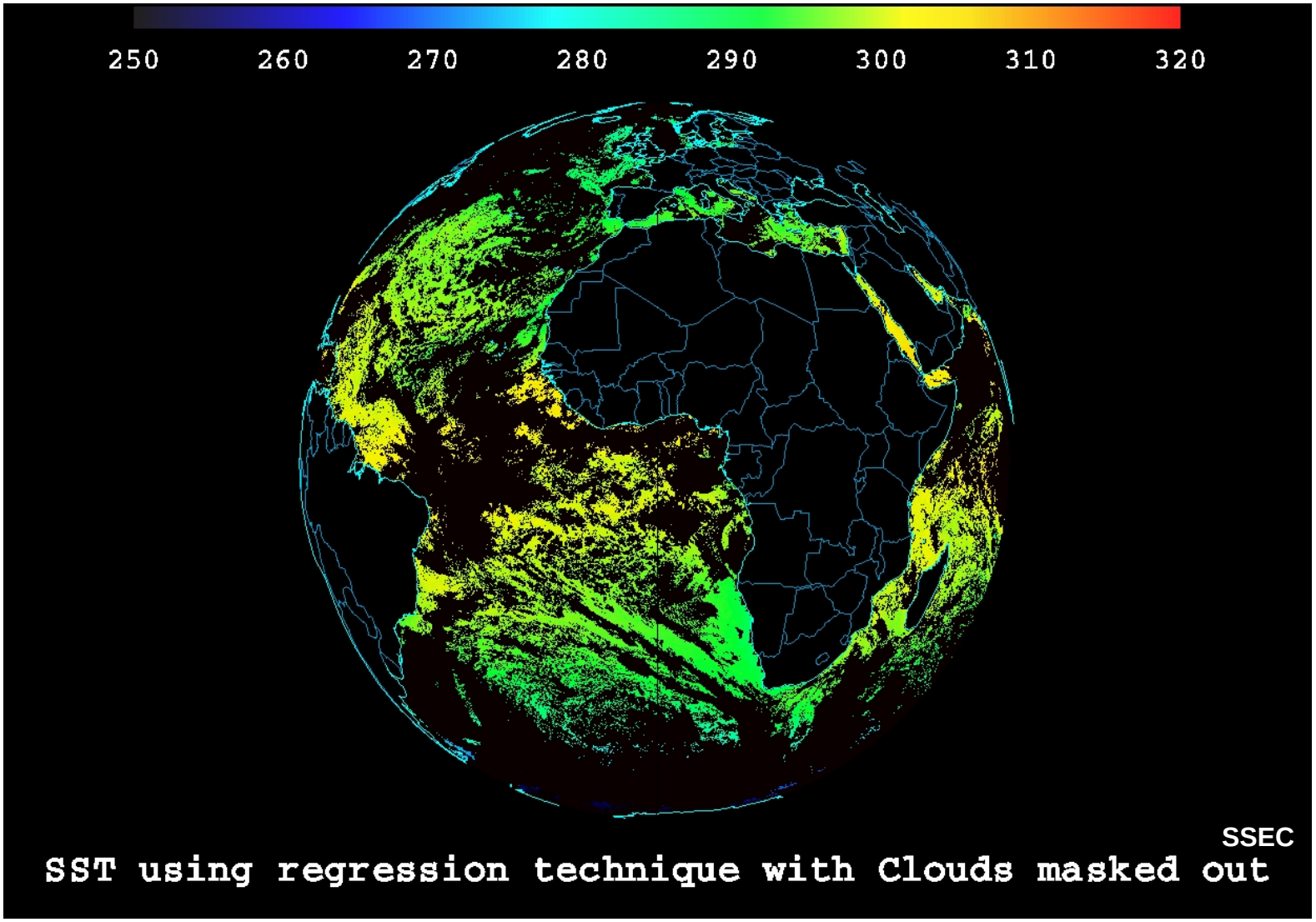
GOES-R LST



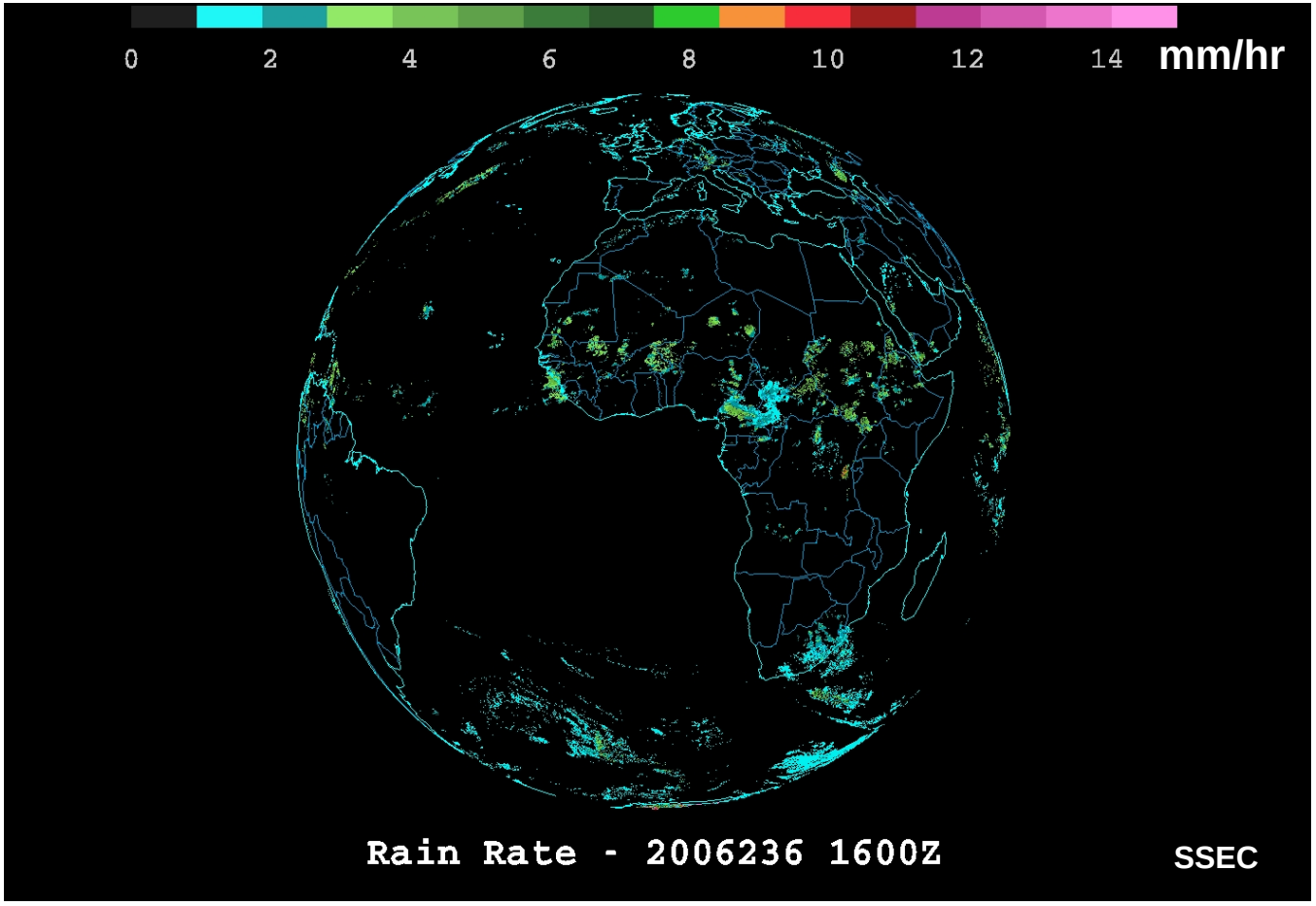
GOES-R NDVI
Clouds masked using ACM



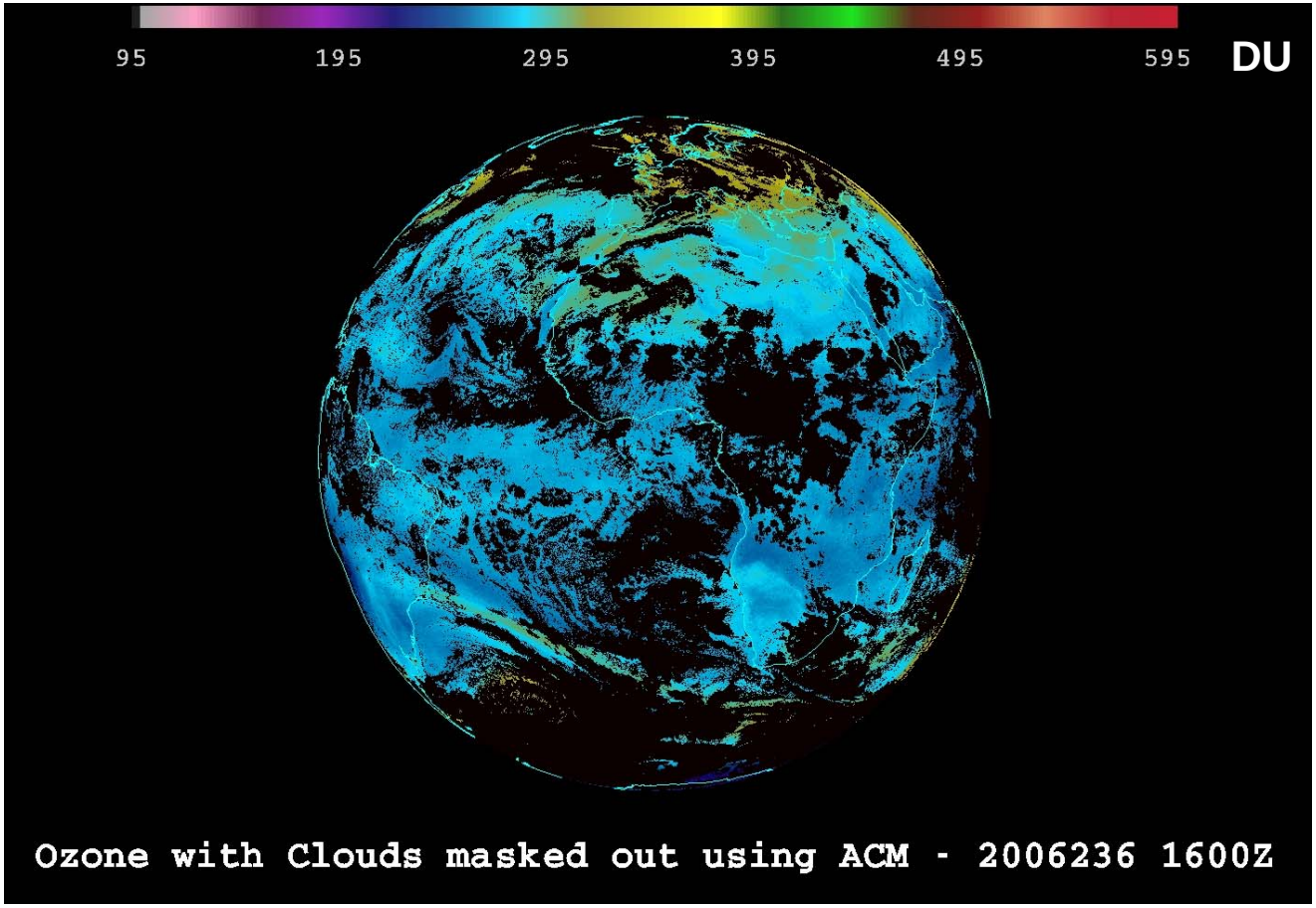
GOES-R SST using regression technique
Clouds masked using ACM
6/5/2008, 1200Z



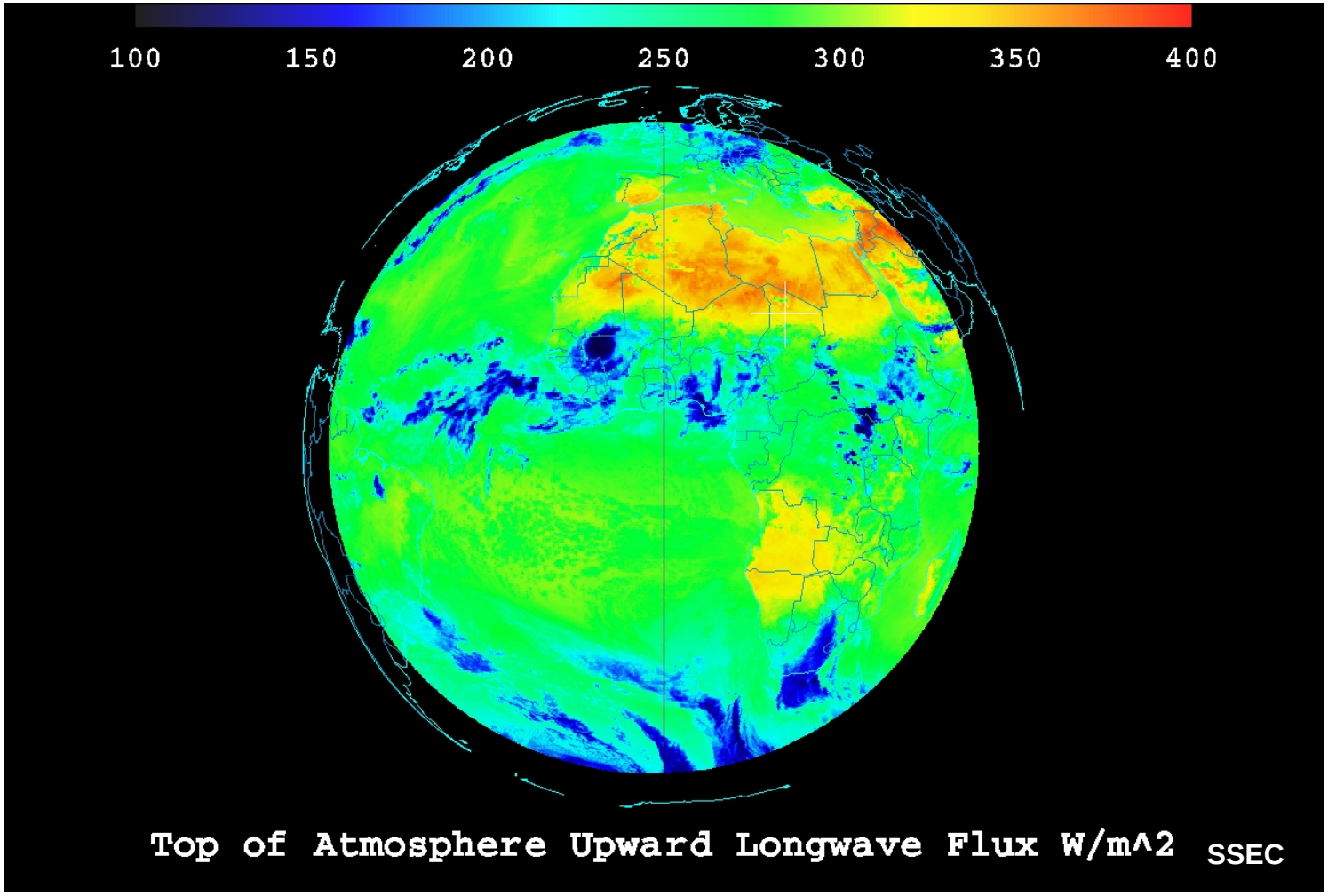
GOES-R Rain Rate Algorithm



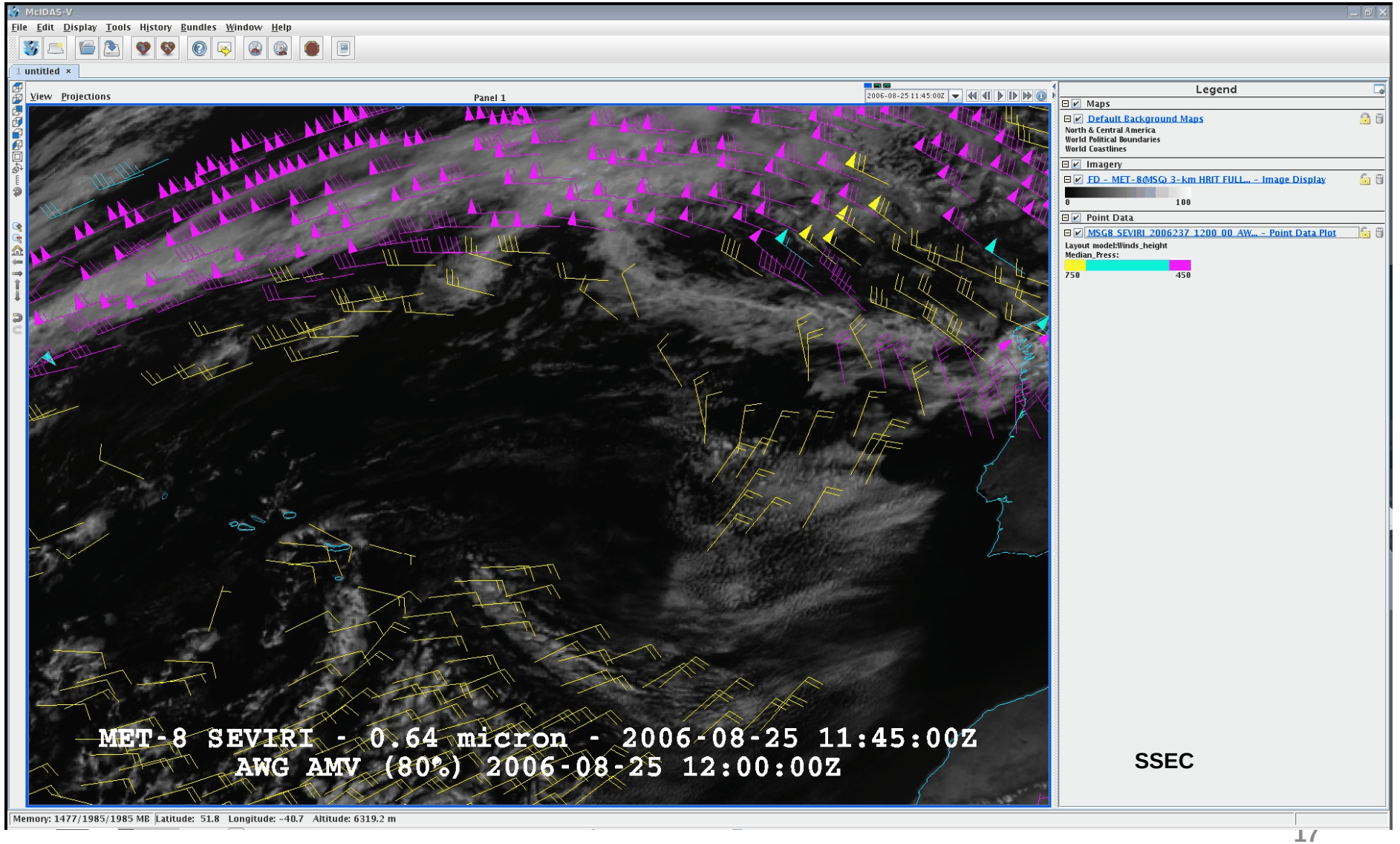
GOES-R Ozone
Clouds masked using ACM



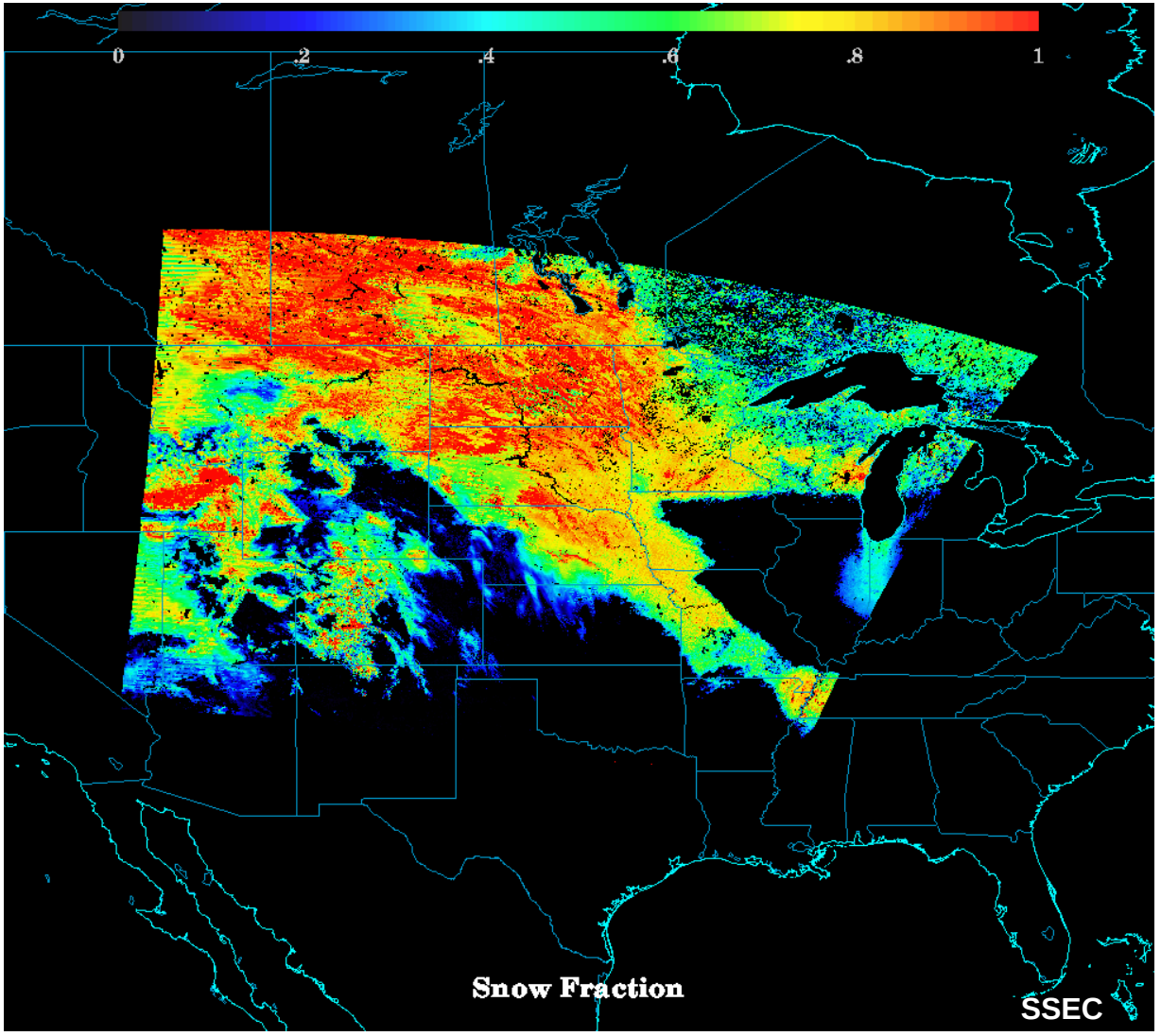
GOES-R
Upward Longwave Flux



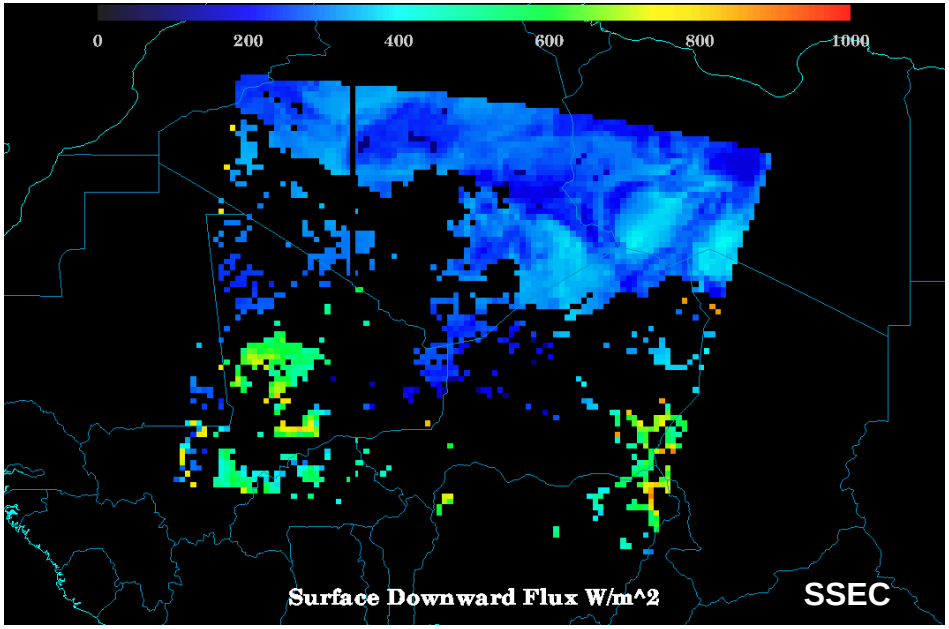
GOES-R AMV
Overlaid on 0.64 μm animation

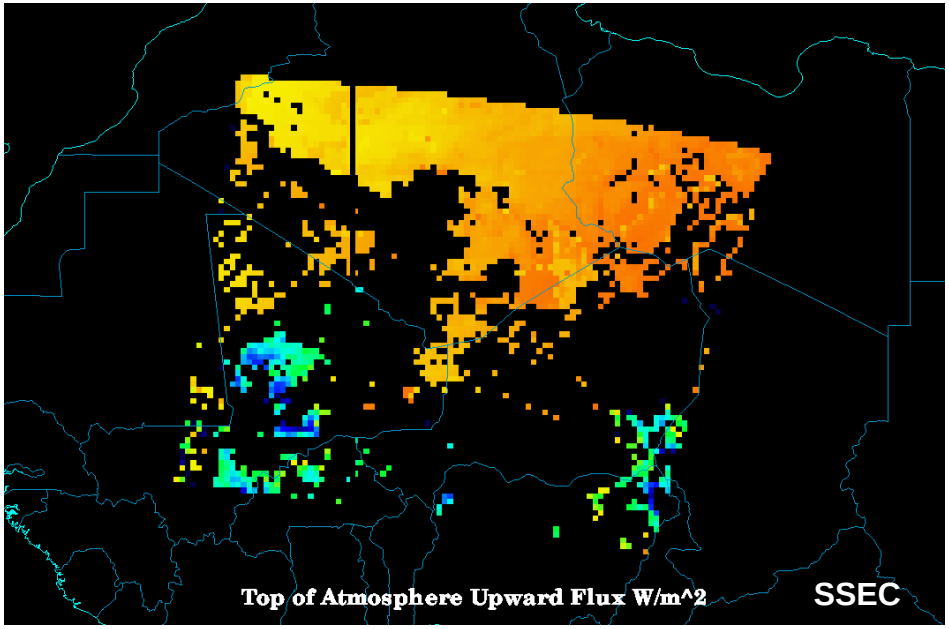


GOES-R Snow Fraction
Terra, 3/1/2009, 1740Z

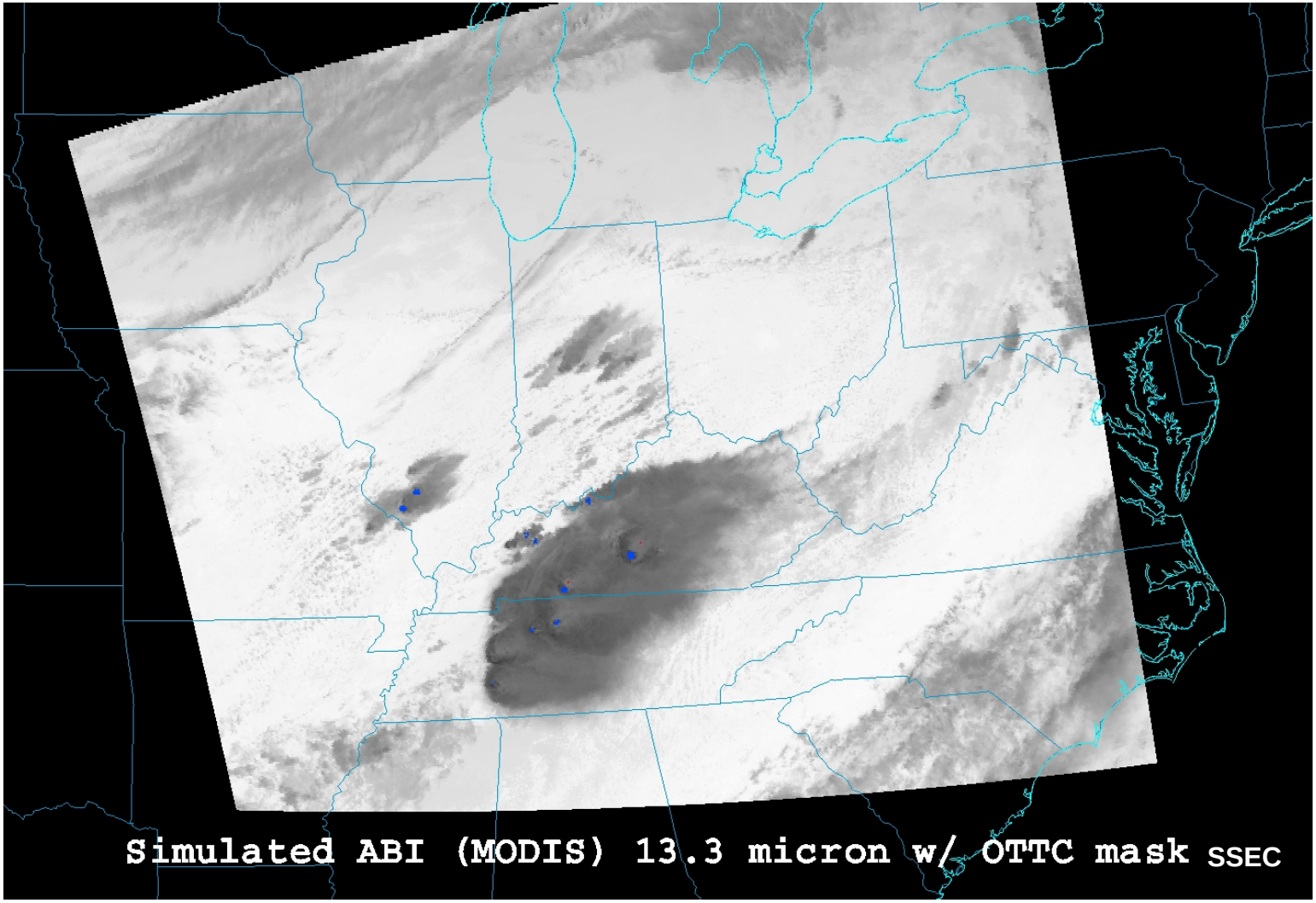


GOES-R Shortwave Radiation Budget
Terra, 8/24/2006, 1020Z



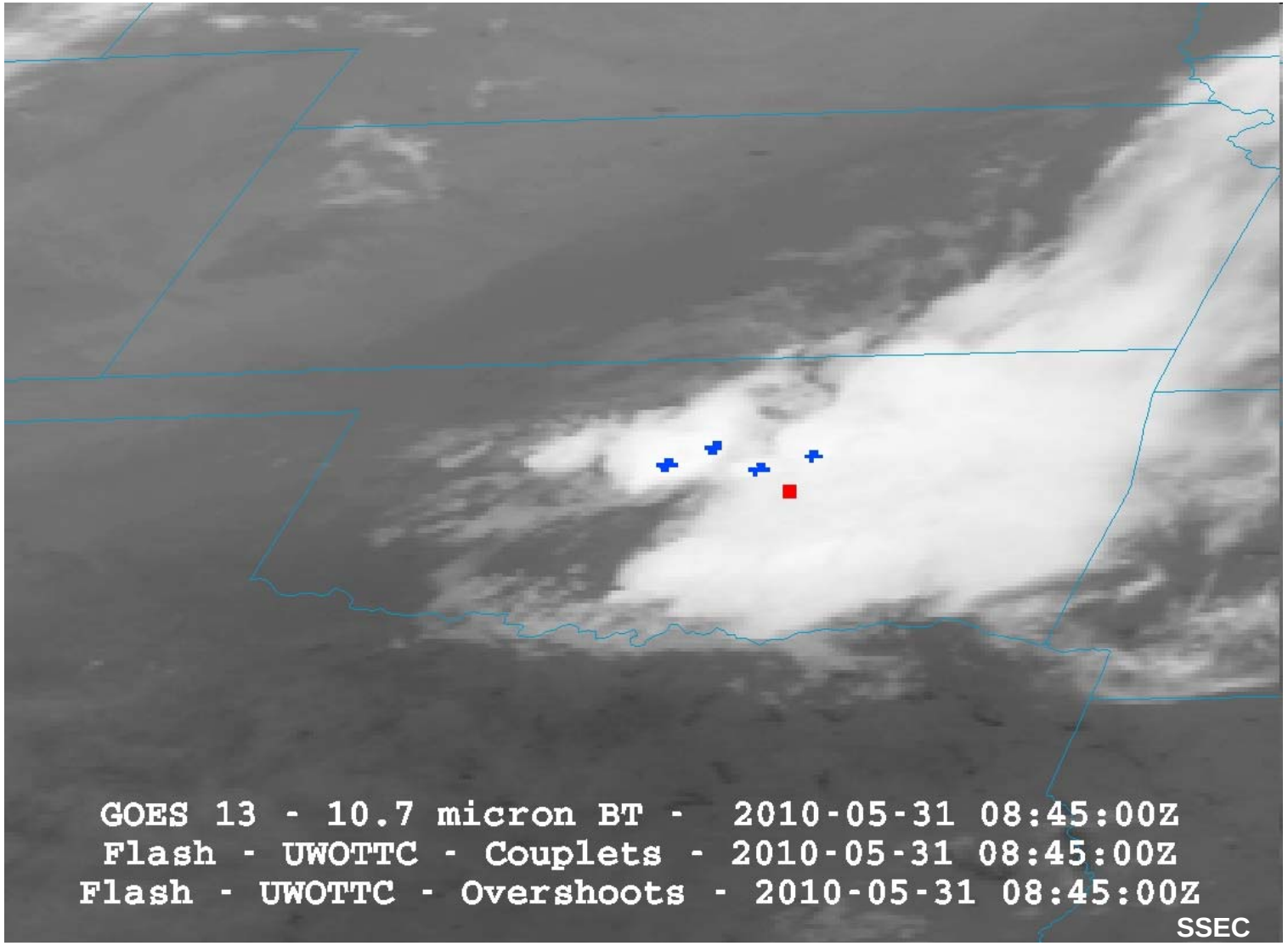


GOES-R Overshooting Tops
Enhanced-V
4/7/2006, 1845Z



Blue – Overshooting Top
Red – Thermal Couplet

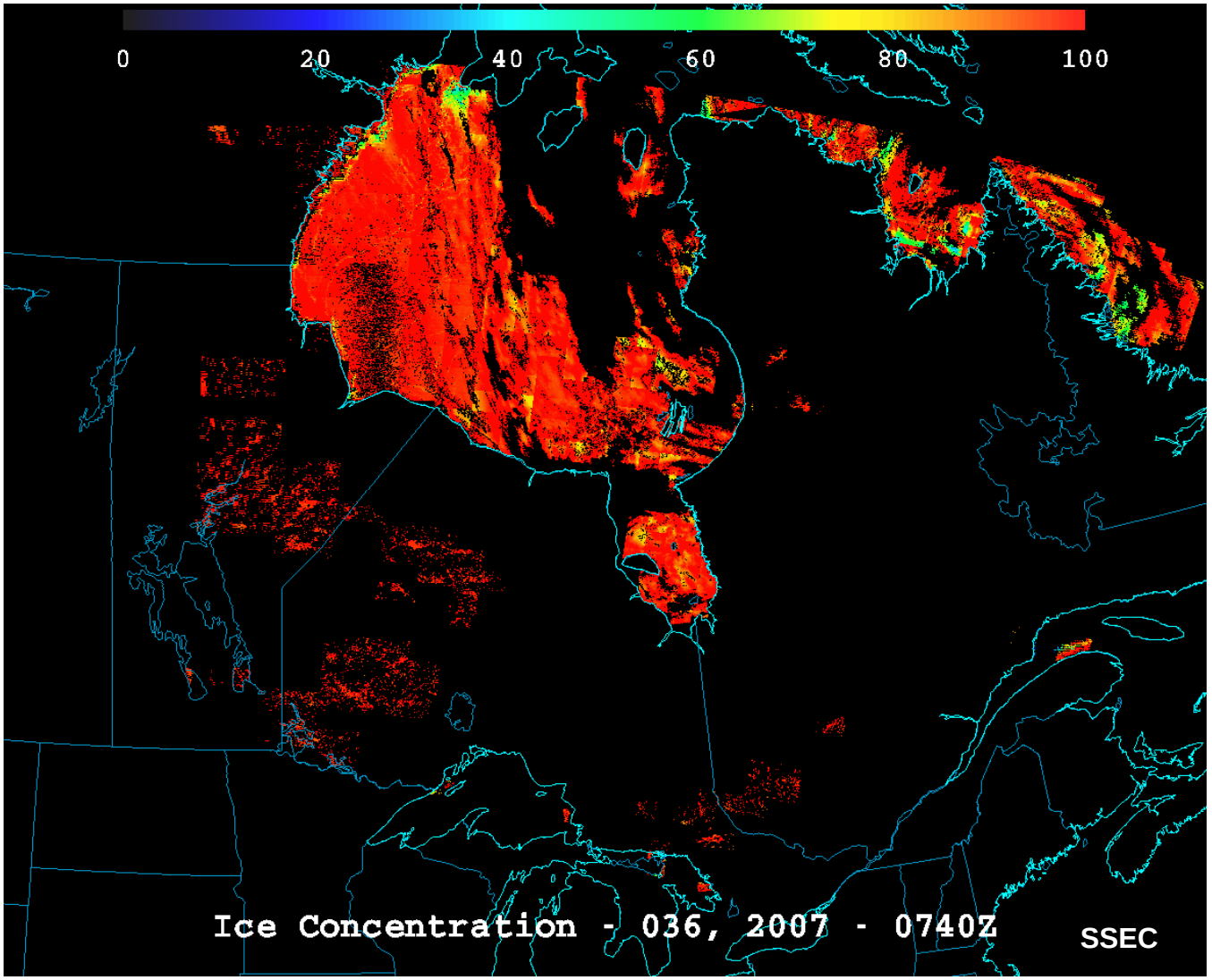
GOES-R Overshooting Tops
Enhanced-V
Proving Ground efforts



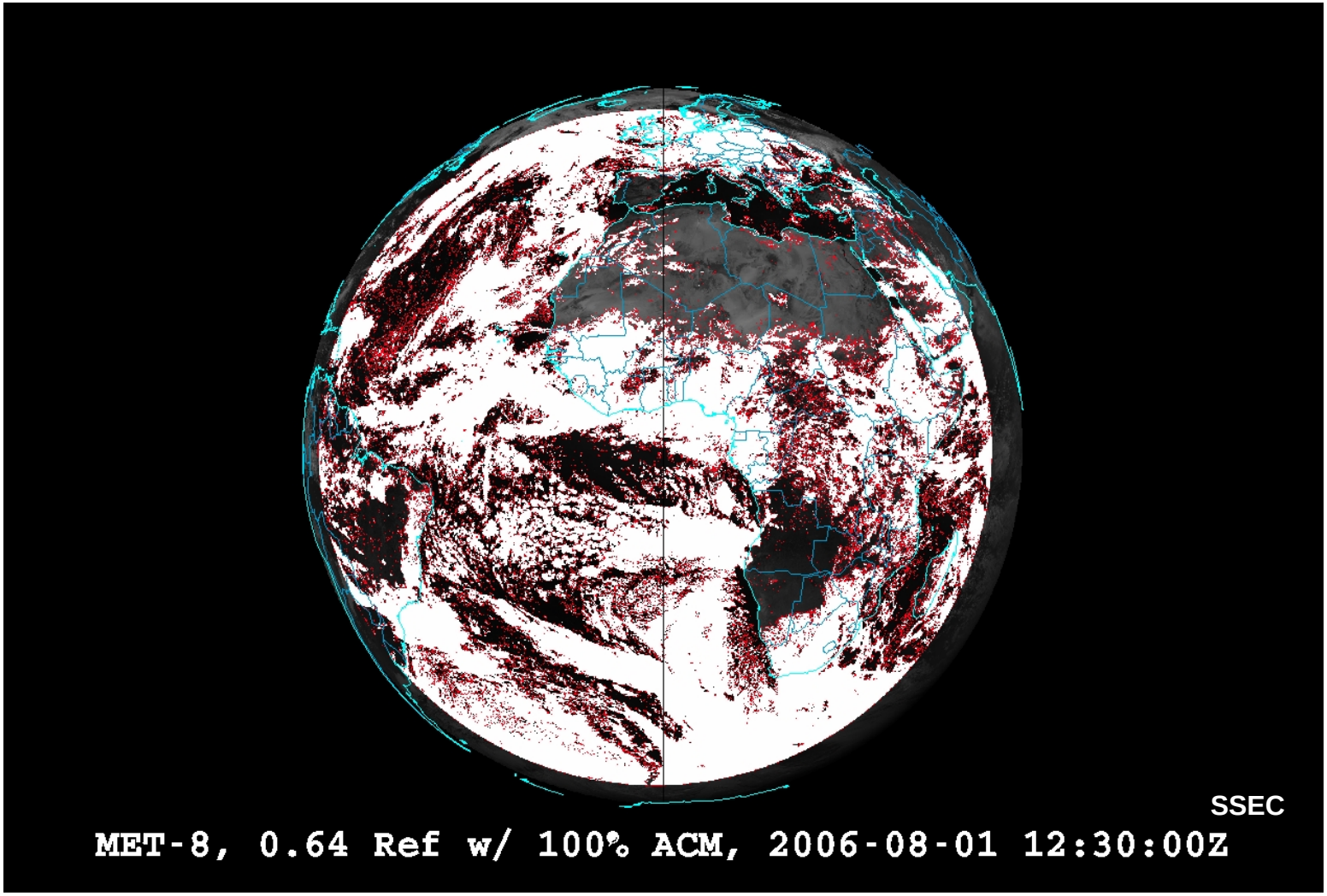
Blue – Overshooting Top

Red – Thermal Couplet

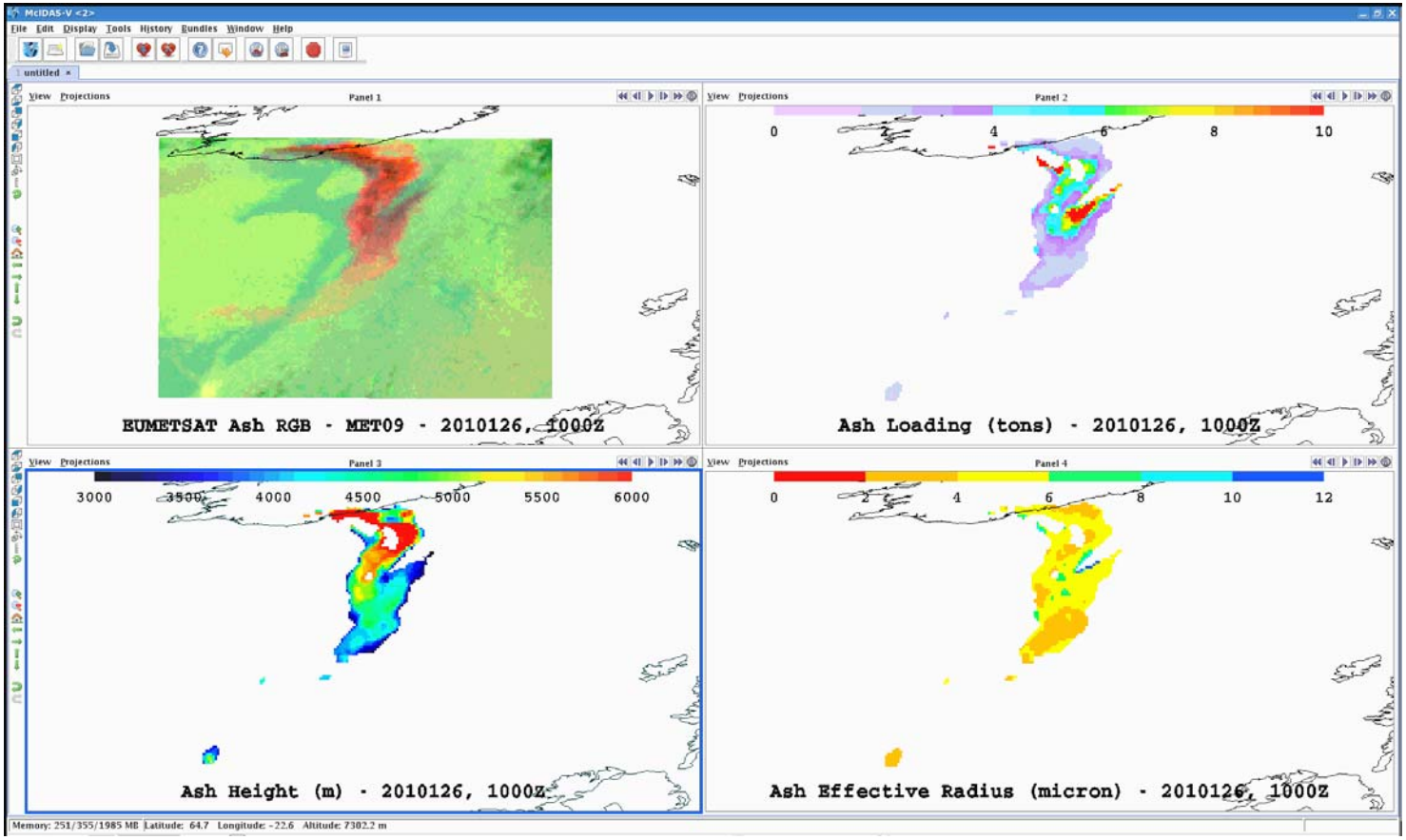
GOES-R Ice Concentration
2/5/2007, 0740Z



GOES-R 100% ACM



GOES-R Volcanic Ash Product
5/5/10 Eyjafjallajökull, Iceland



Vol Ash Data provided by Michael Pavolonis (NOAA/NESDIS/STAR)
EUMETSAT Ash Enhancement provided by Hans Peter, EUMETSAT

Other Simulated datasets

- McIDAS-V has not only been used to visualize the GOES-R AWG product, but has also been used to demonstrate the improved resolution capability of GOES-R

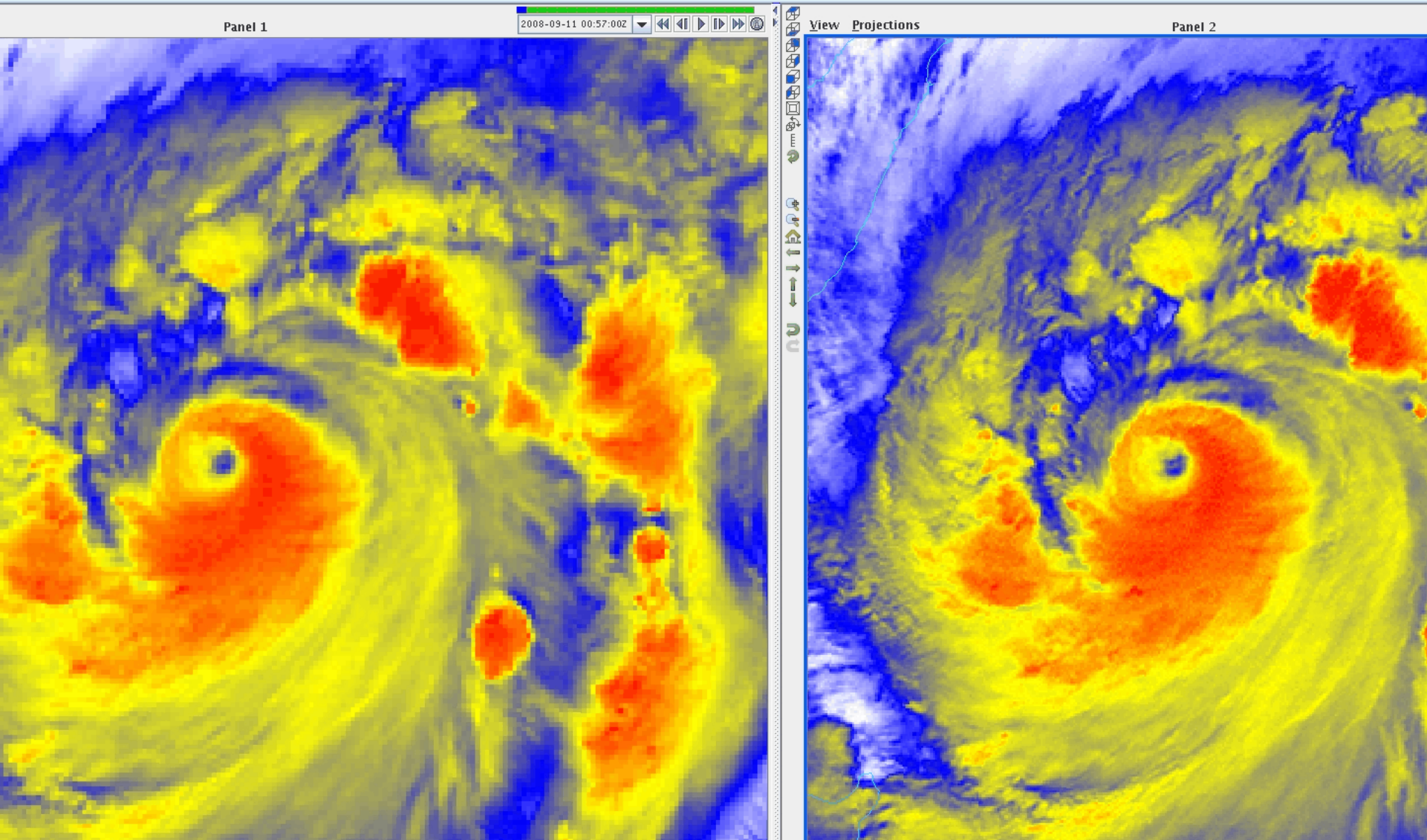
- The usages of side-by-side panels is useful in demonstrating the resolution differences in the ABI resolution as compared to current GOES

Side by side analysis animation
4km vs 2km HRIT for MTSAT-1R

Thanks to JMA for providing the 2km HRIT data

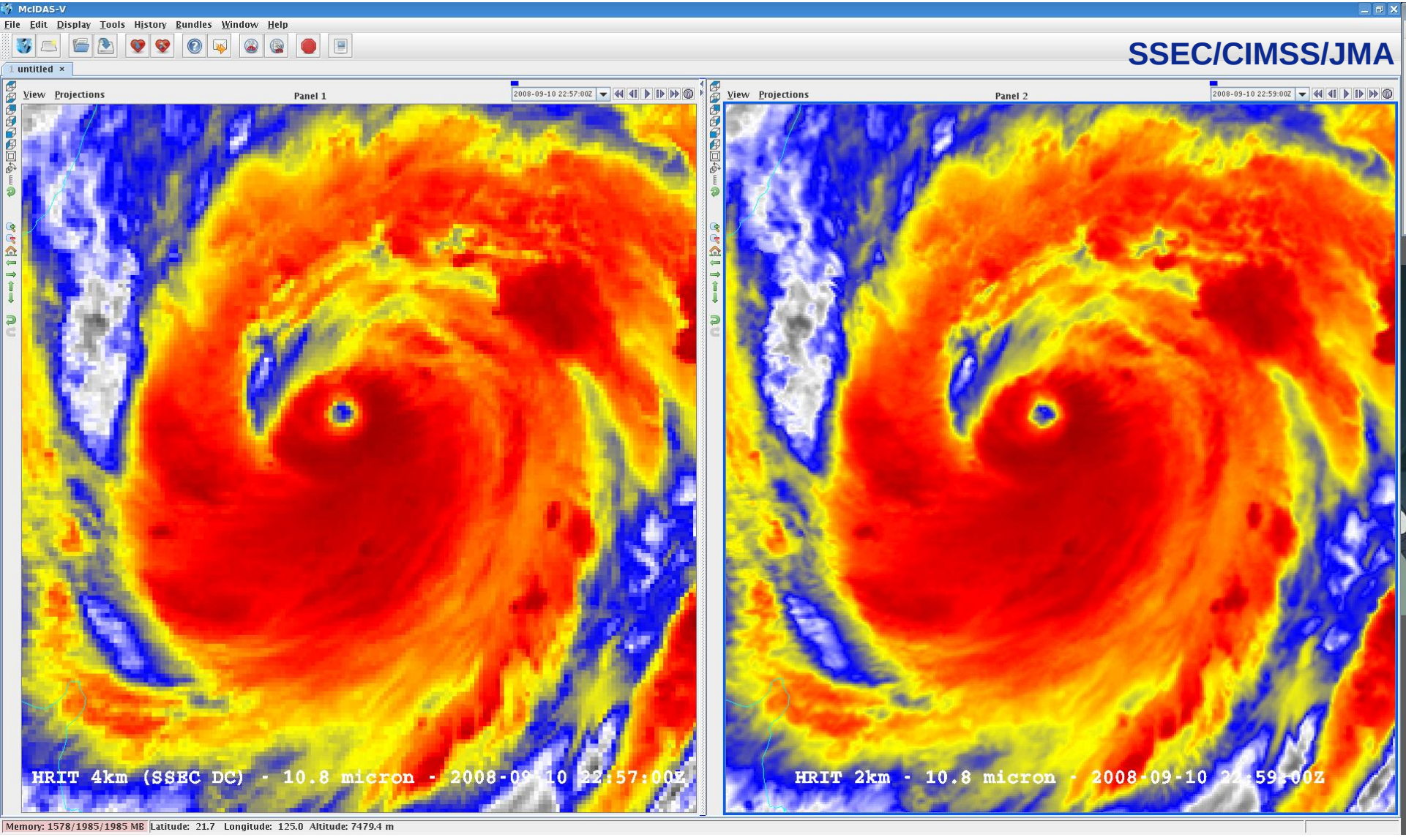
History Bundles Window Help

SSEC/CIMSS/JMA

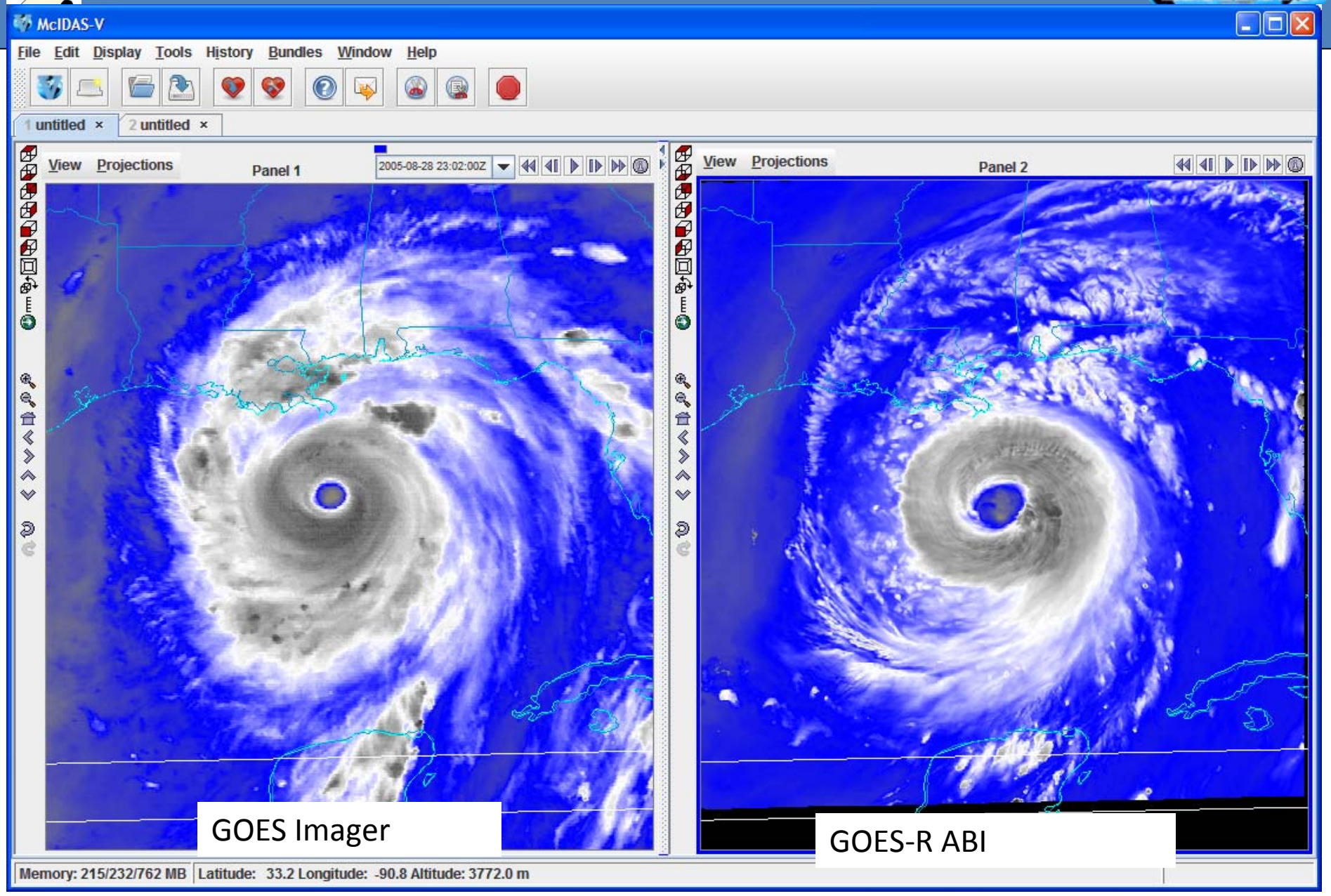


Side by side analysis
4km vs 2km HRIT for MTSAT-1R

Thanks to JMA for providing the 2km HRIT data

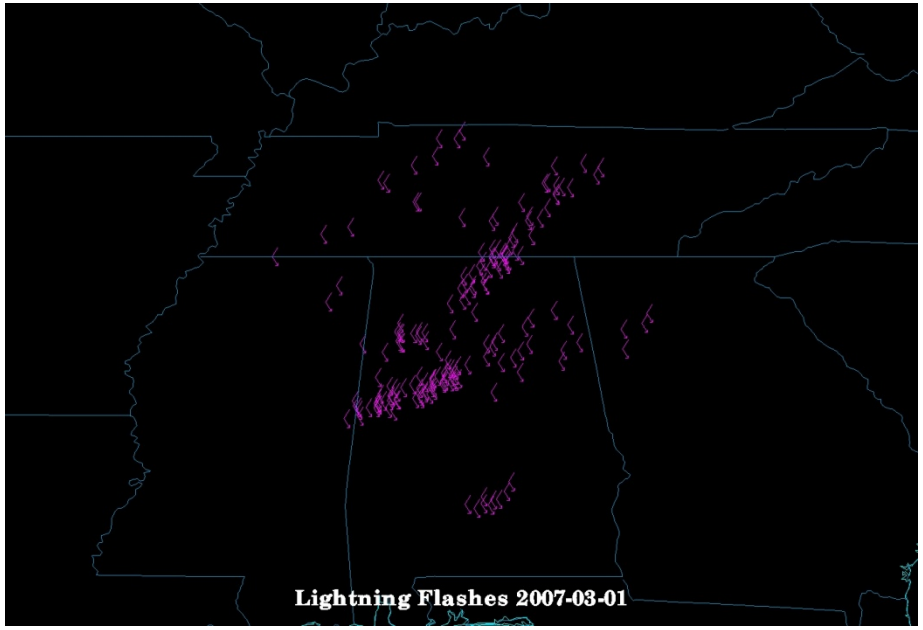


Simulated ABI: Katrina



Summary of ABI products in McIDAS-V

- All of the ABI Baseline Products are able to be visualized in McIDAS-V
  - We are currently working towards visualizing the GLM products as well.



Summary of ABI products in McIDAS-V

- As they become available, Option 2 products are being tested in McIDAS-V

- We are making a concerted effort to gather the enhancements that are used by the various AWG teams.

Questions?