Applications of the NPOESS Imagers

Thomas F. Lee, Jeffrey Hawkins, F. Joseph Turk, Peter Gaiser, Mike Bettenhausen

Naval Research Laboratory
Monterey CA and Washington DC

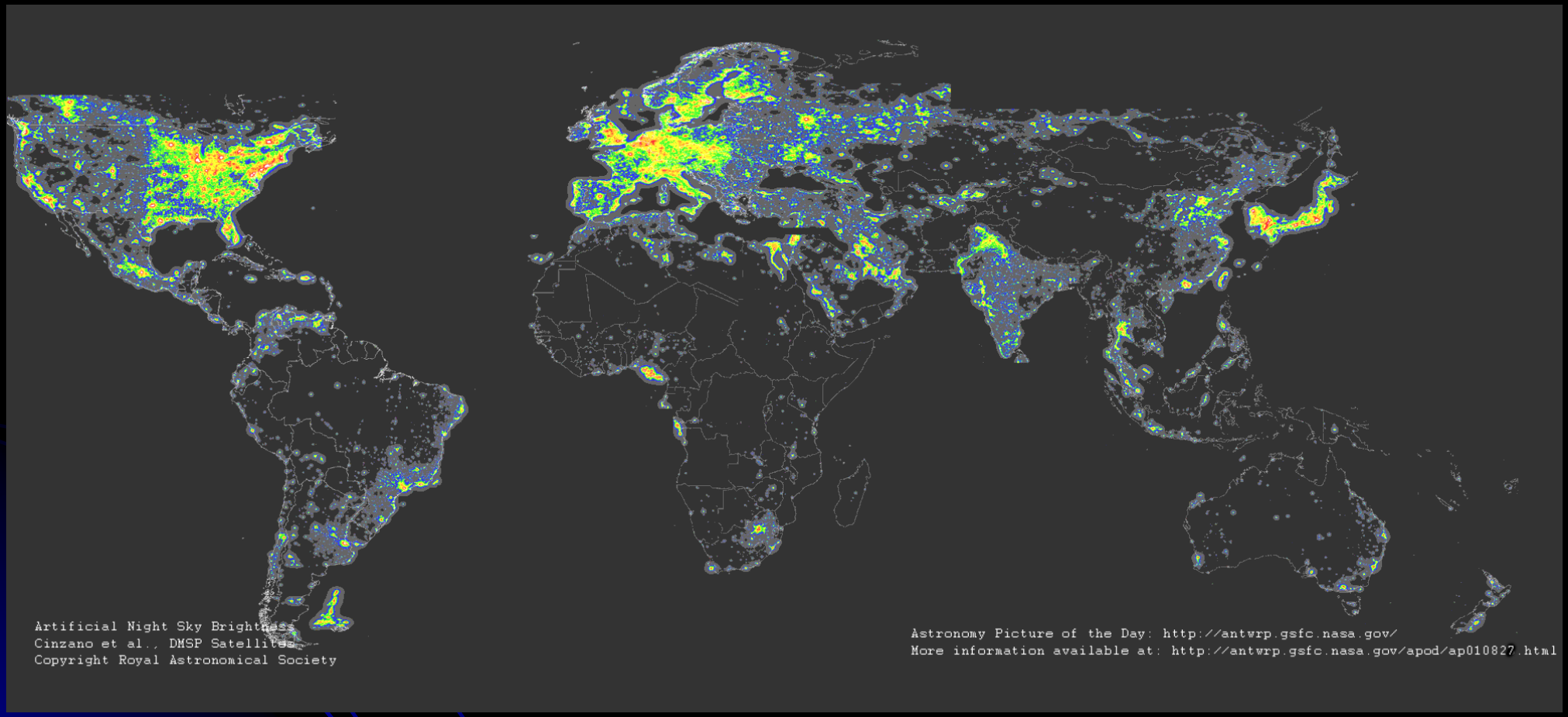
Steven D. Miller
Cooperative Institute for Research in the Atmosphere
Fort Collins Colorado

American Meteorological Society Joint Session
13 January 2009

Visible Infrared Imaging Radiometer Suite (VIIRS)

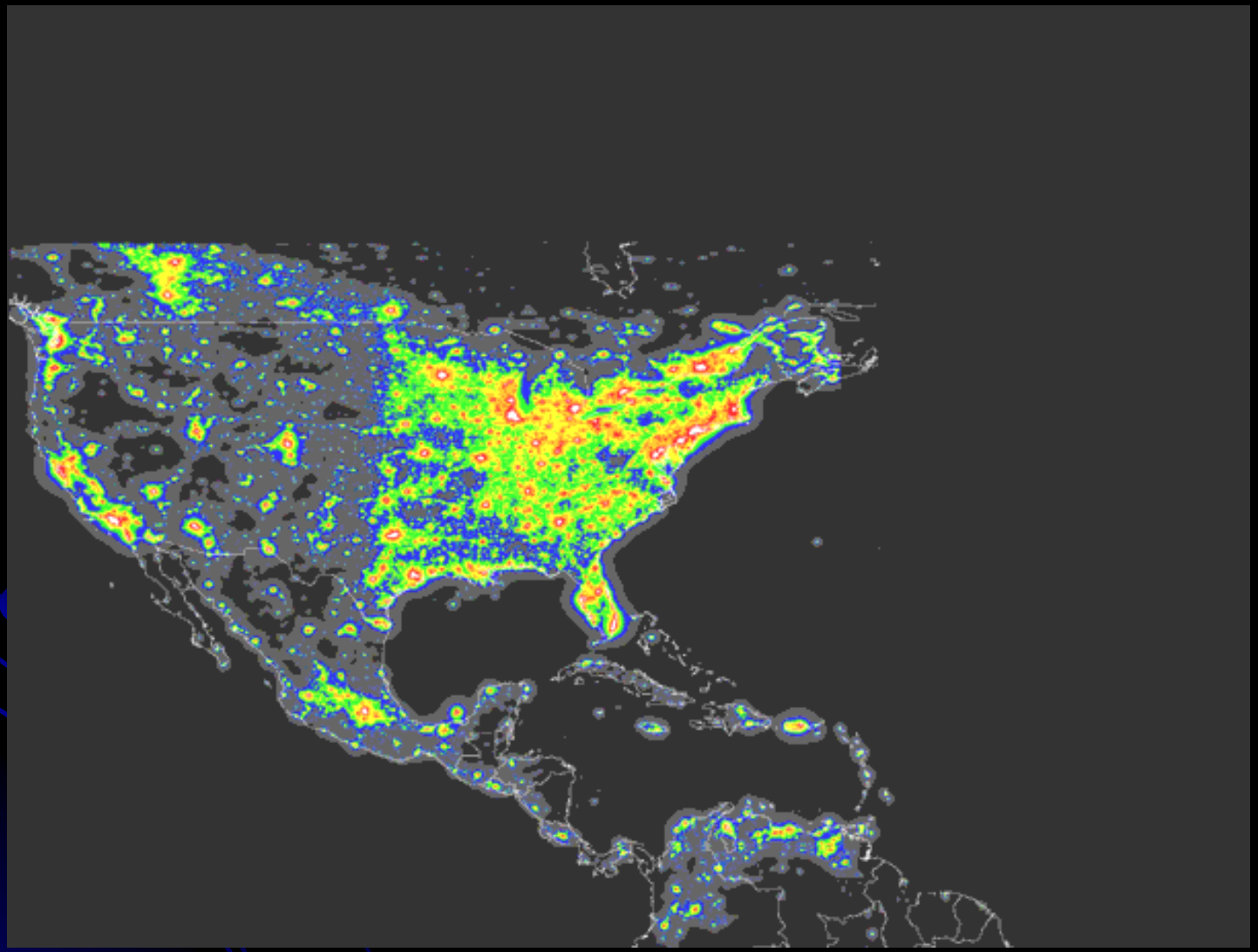
- On NPP (2010) and NPOESS (C1 2013)
- 22 Channels between 0.3 and 12 microns
- Legacy from DMSP OLS, NOAA AVHRR, EOS MODIS
- Swath Width ~3000 km (MODIS 2330 km)
- Cleaner, Sharper, More Detailed Imagery
- Dramatically Improved (compared to DMSP) Day/Night Band (DNB)
- DNB Demonstration and True Color

Dramatically Improved Day/Night Band (DNB)



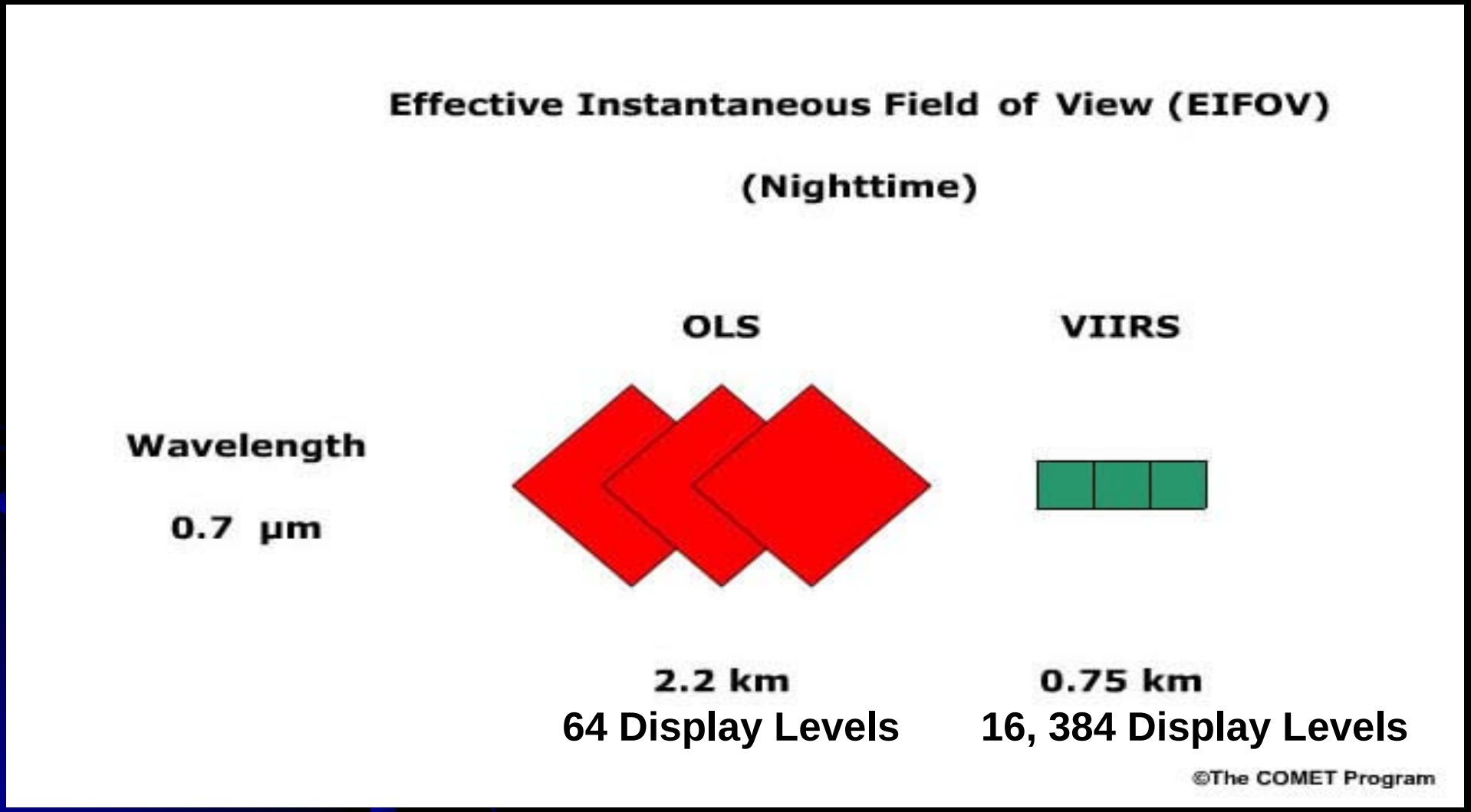
NASA GSFC

Dramatically Improved Day/Night Band (DNB)



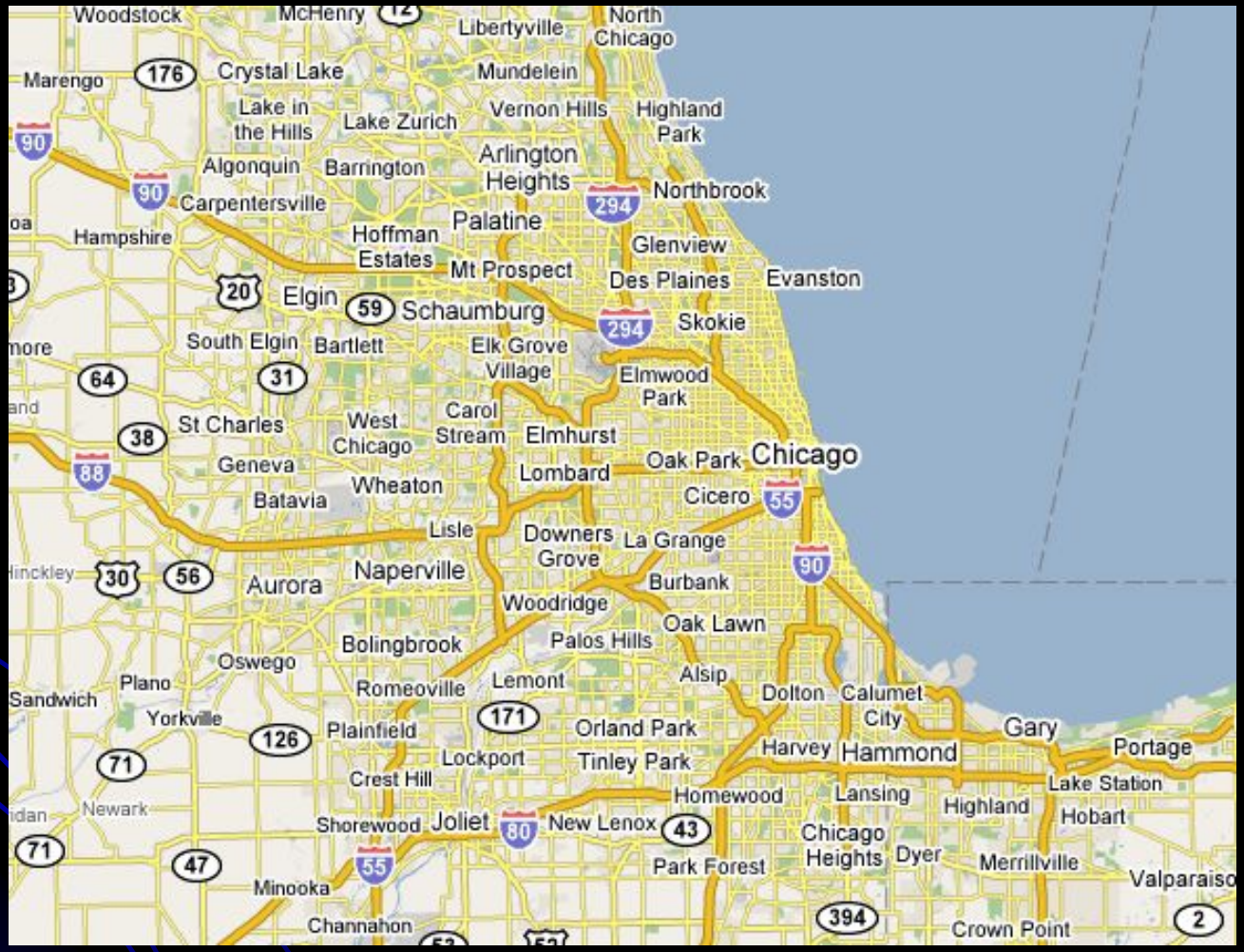
NASA GSFC

DNB Improved Field of View



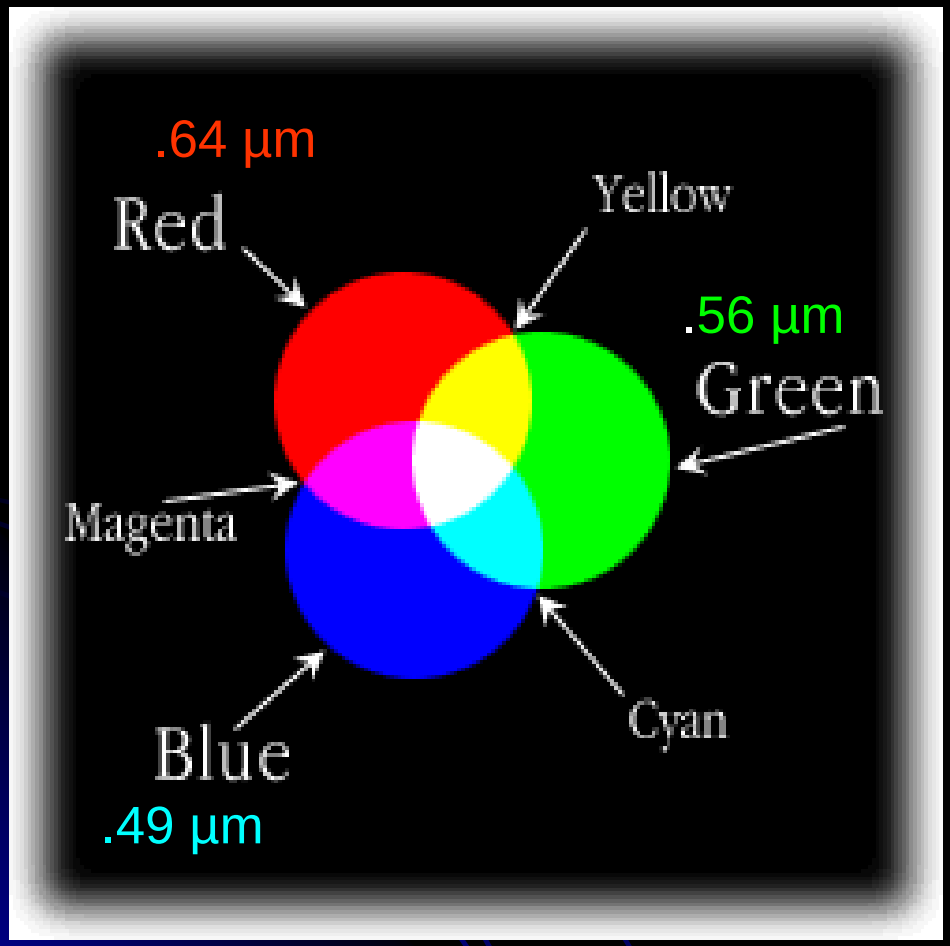
Artist's Visualization

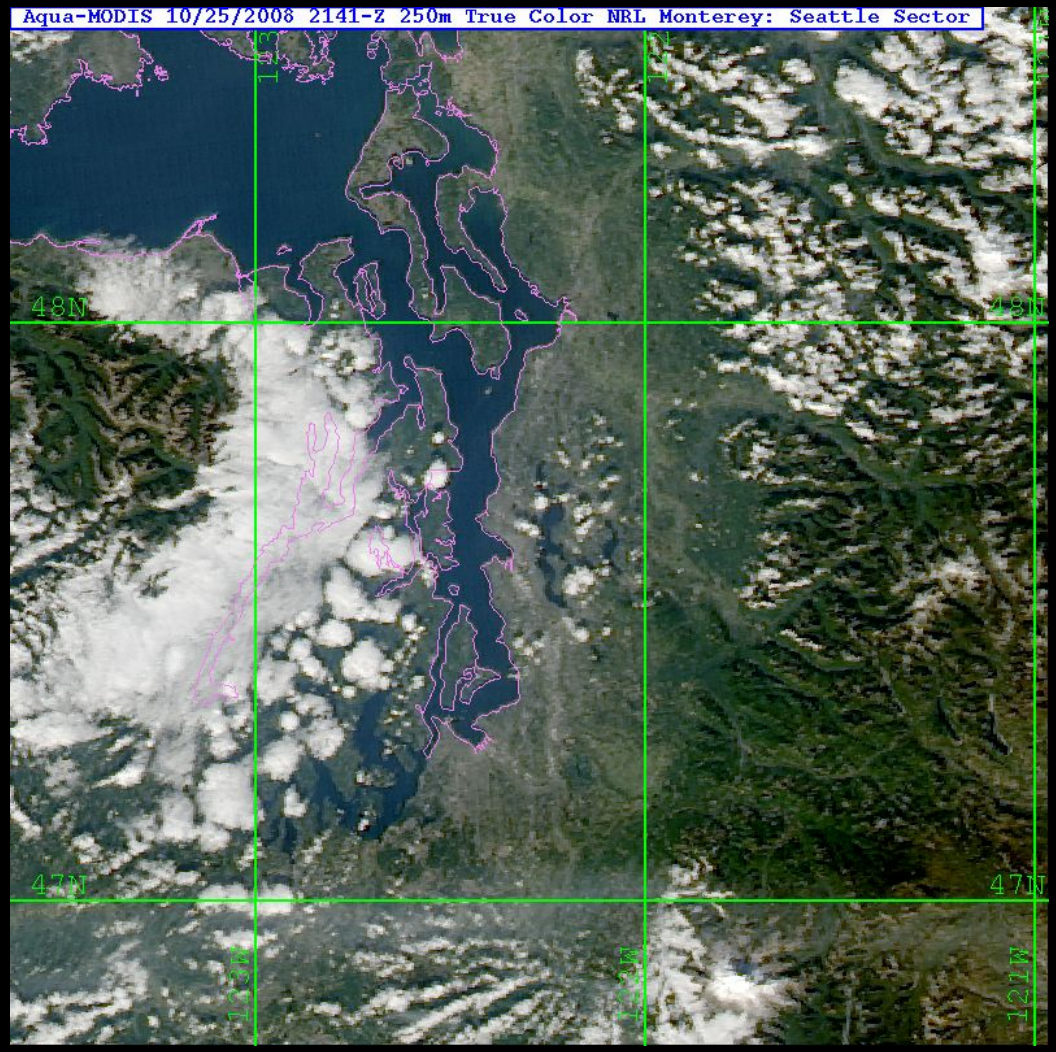
Can we know the weather over Chicago?



Anticipating VIIRS DNB

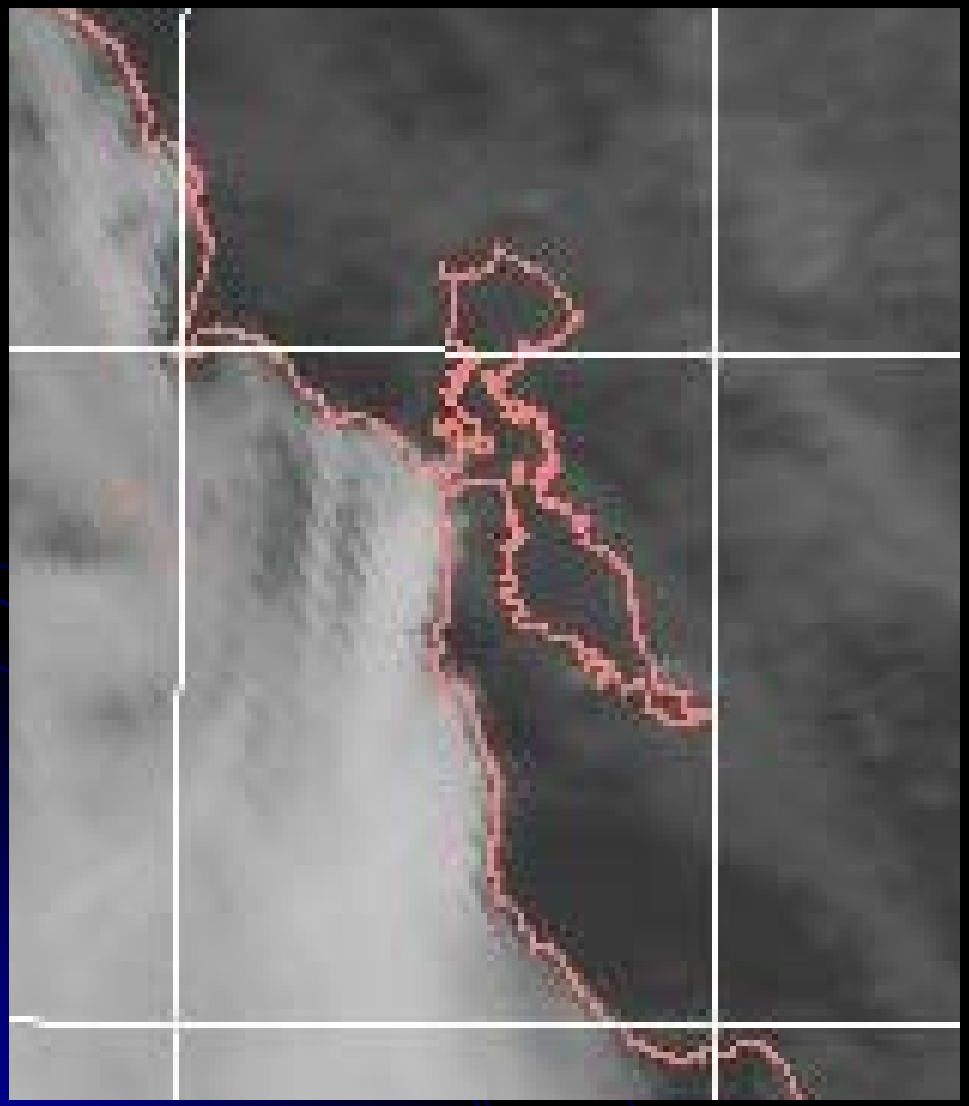
First Operational Weather Satellite with True Color



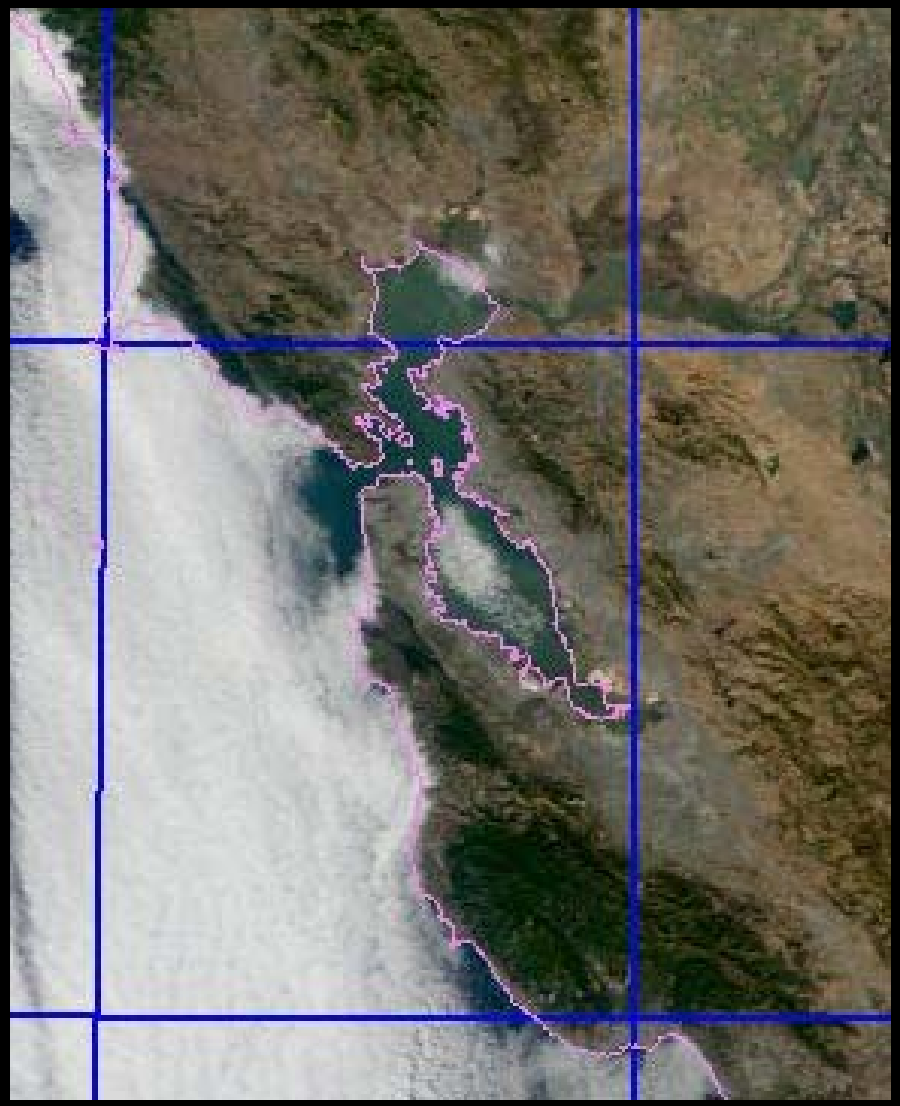


Synergistic Improvement

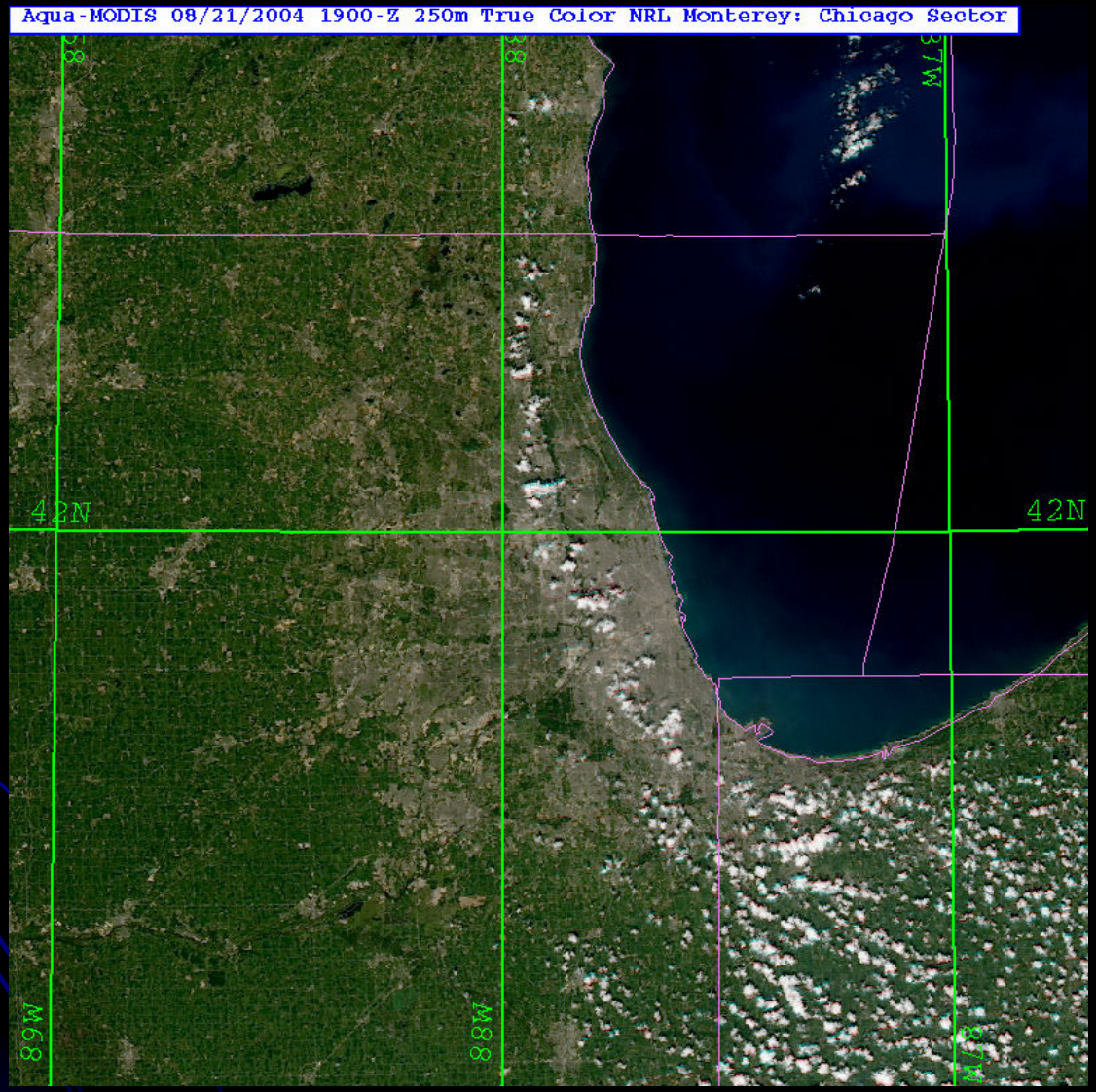
AVHRR 1.1 Km; Edge of Scan; Visible



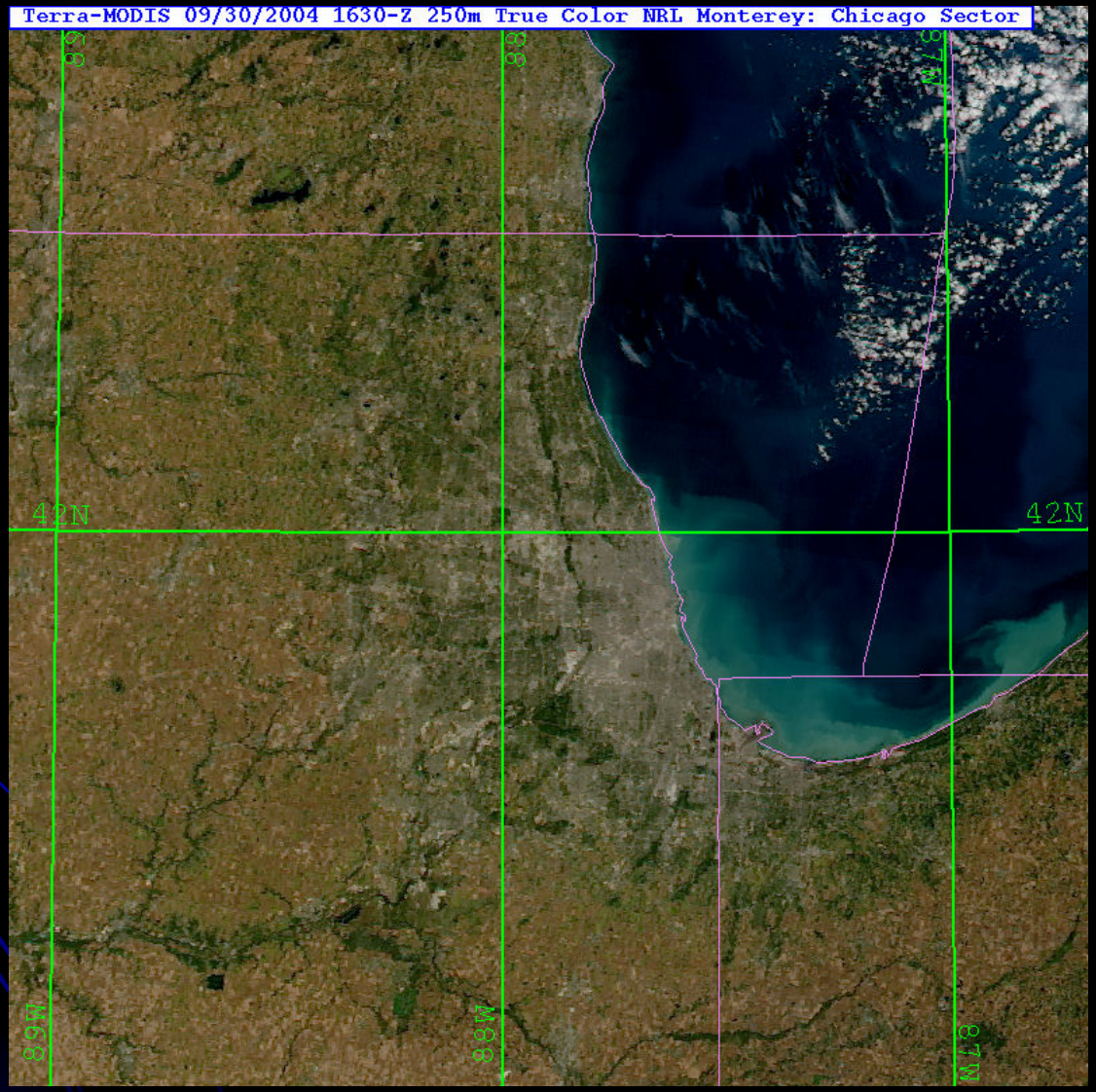
MODIS .25 KM; True Color
Minimized Edge of Scan Effects



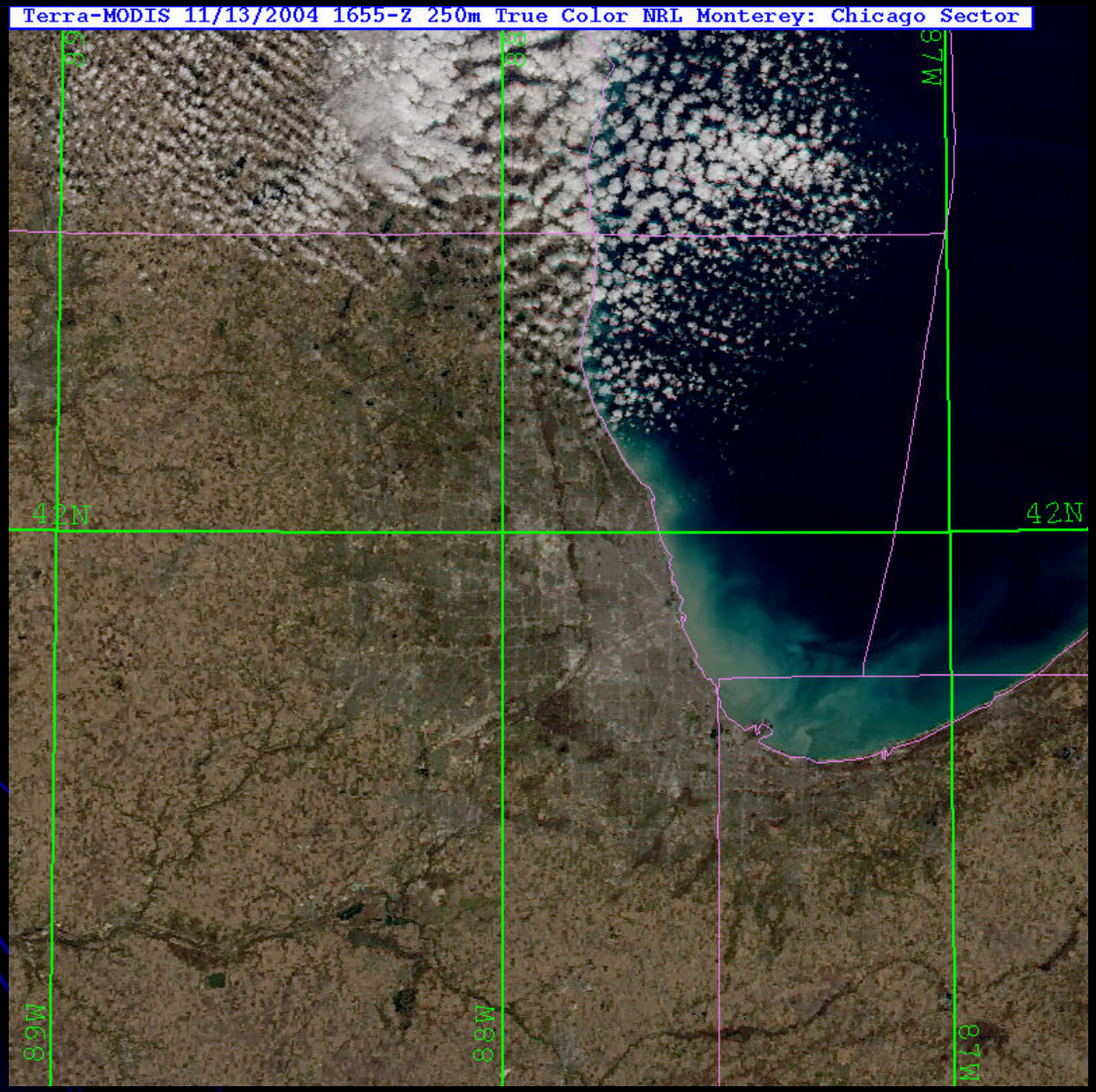
Chicago: Summer Green



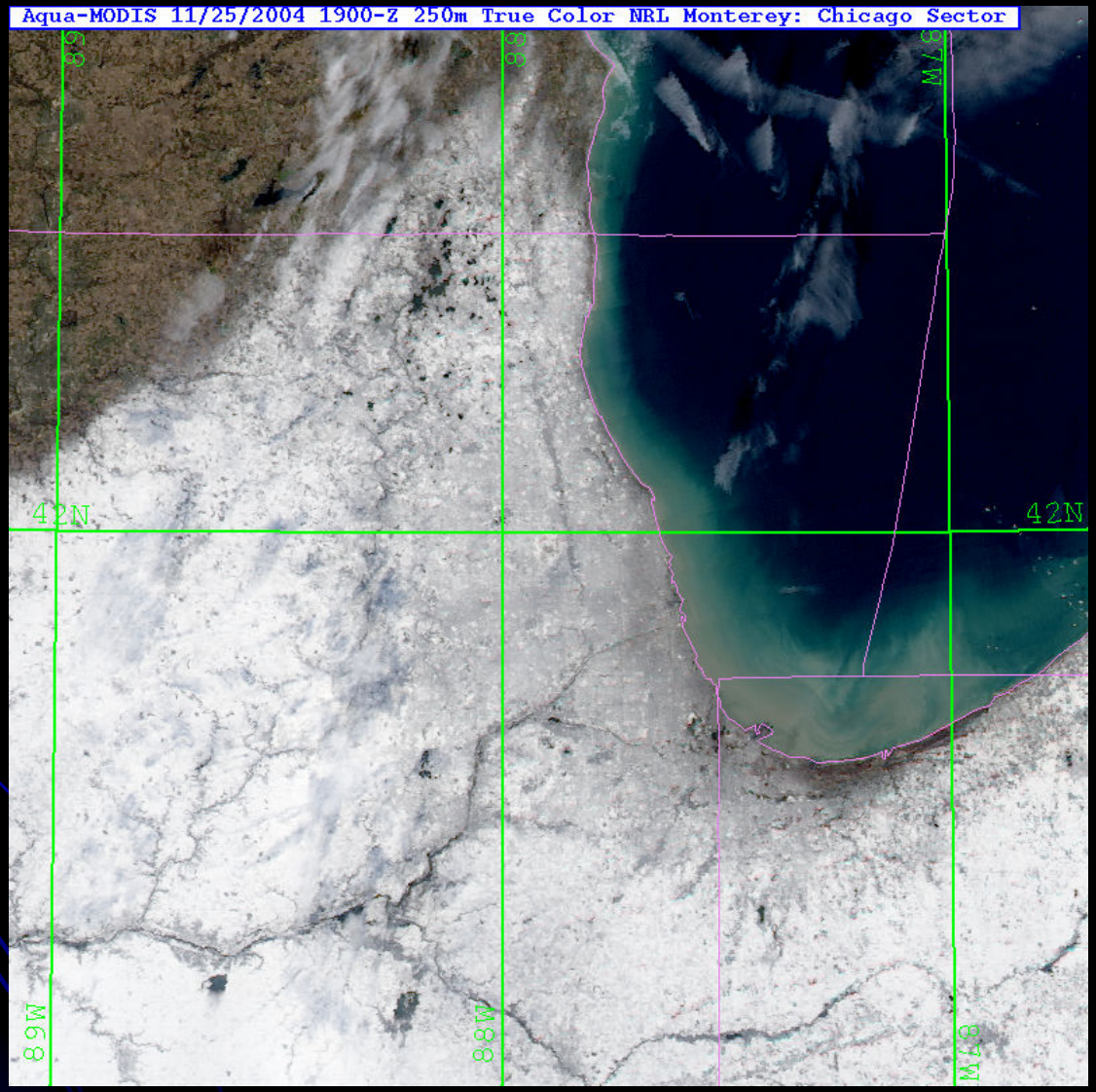
Chicago: Fall Color



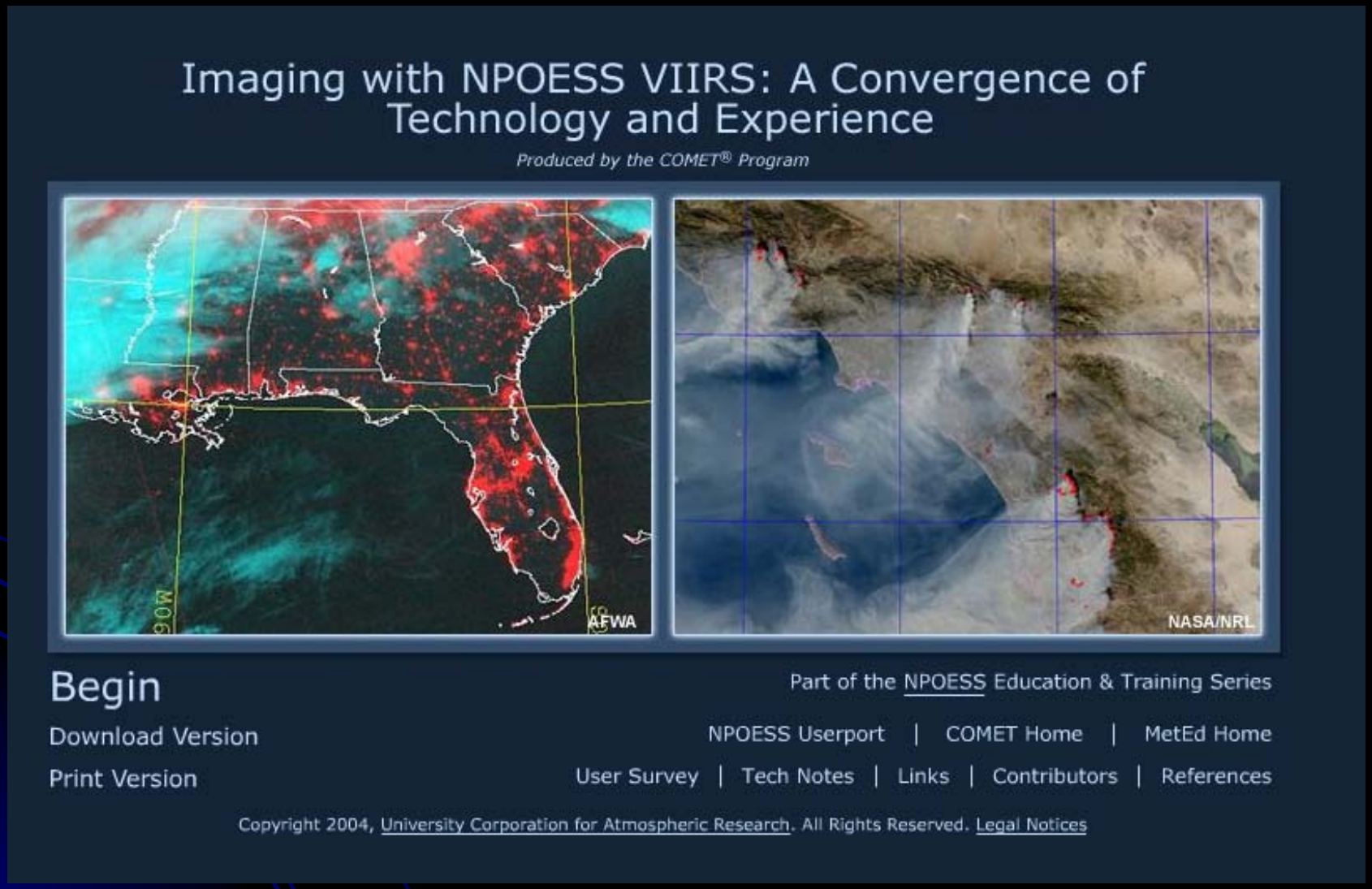
Chicago: After the leaves Fall



Chicago: Late Autumn Snow



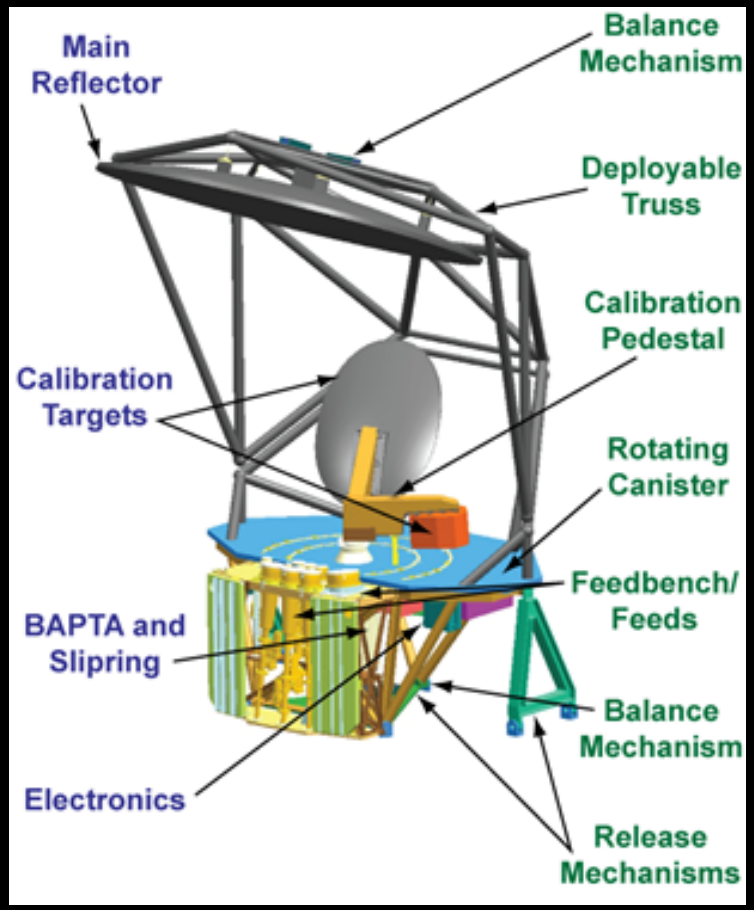
COMET VIIRS Module



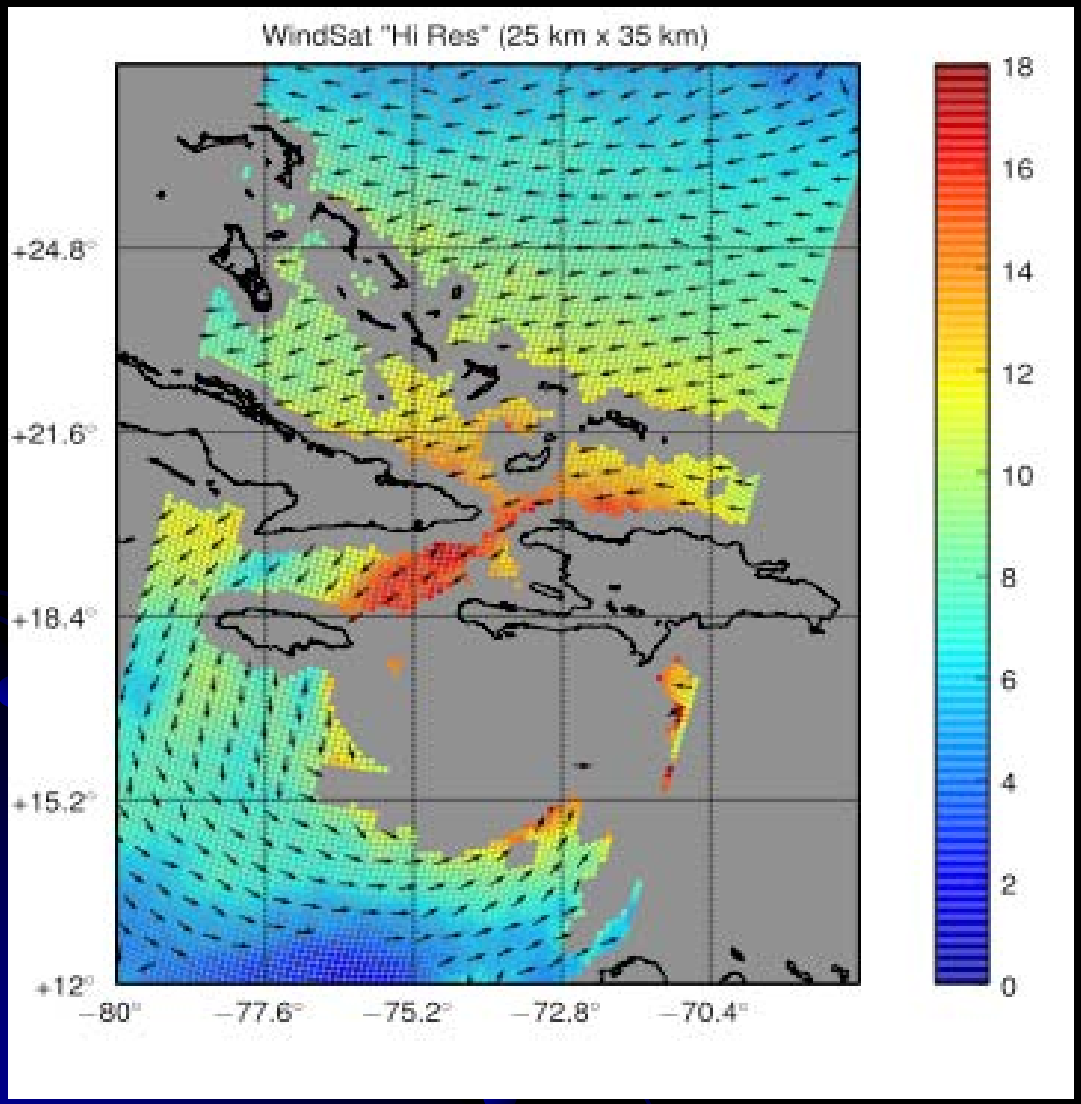
www.meted.ucar.edu/npoess/viirs

Microwave Imager Sounder (MIS)

- Replacement for Conical Microwave Imager Sounder (CMIS)
- Scheduled for C2 (2016)
- Uses Passive Microwave Energy to see through clouds: SST, Sea Surface Winds, Soil Moisture, Atmospheric Moisture, Atmospheric Sounding, Ice, Snow, Clouds, Precipitation, Imagery
- ~ 1700 Km Swath Width
- Focus here is on Sea Surface Winds
- Simulation by R&D WindSat



WindSat Surface Vector Wind Retrieval Performance

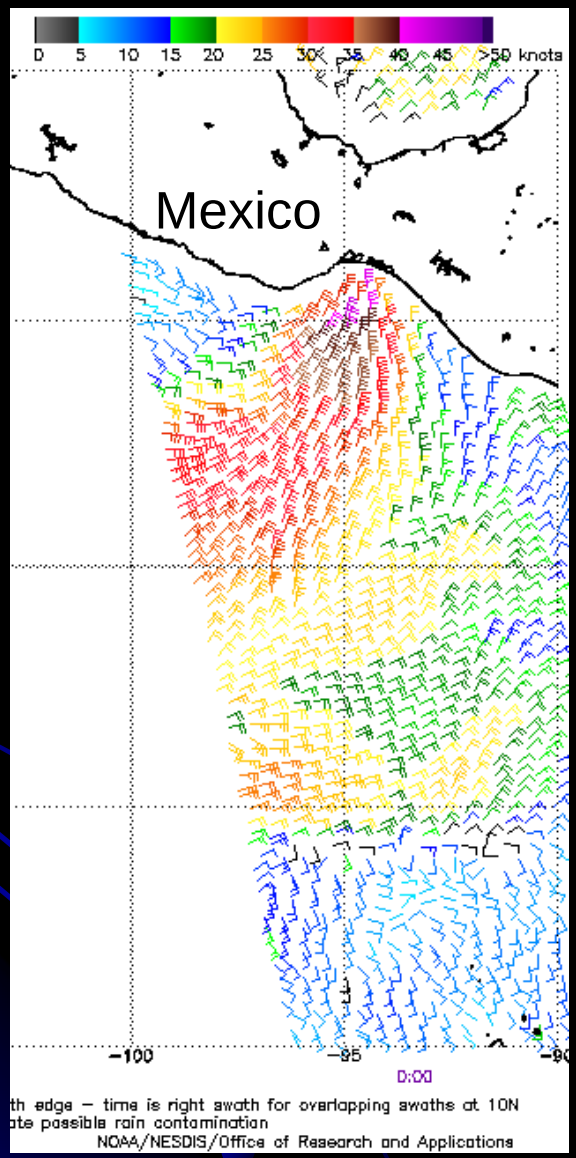


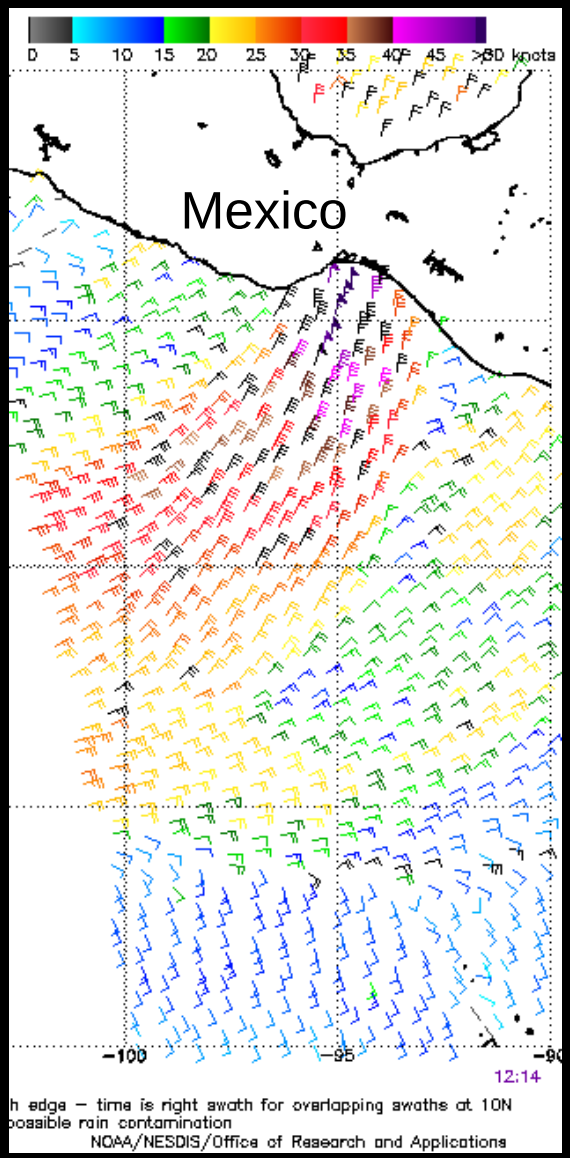
- **High Spatial Resolution**
- **Similar Performance: Speed/Direction**
- **Better Near Coastlines**
- **Better Able to Capture High Winds**

Hurricane Dean
19 Aug 2007

WindSat Sea Surface Winds

R& D
WindSat





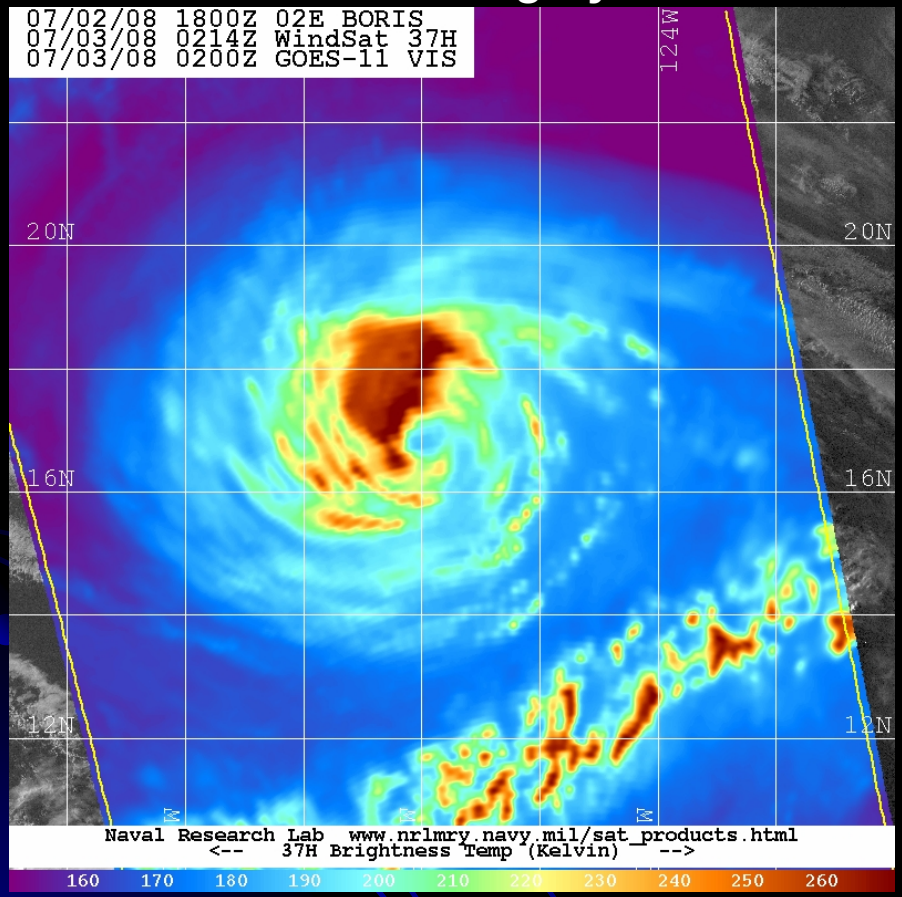
QuikScat

NOAA/NESDIS/OFFICE of Research and Applications, Zorana Jelenak

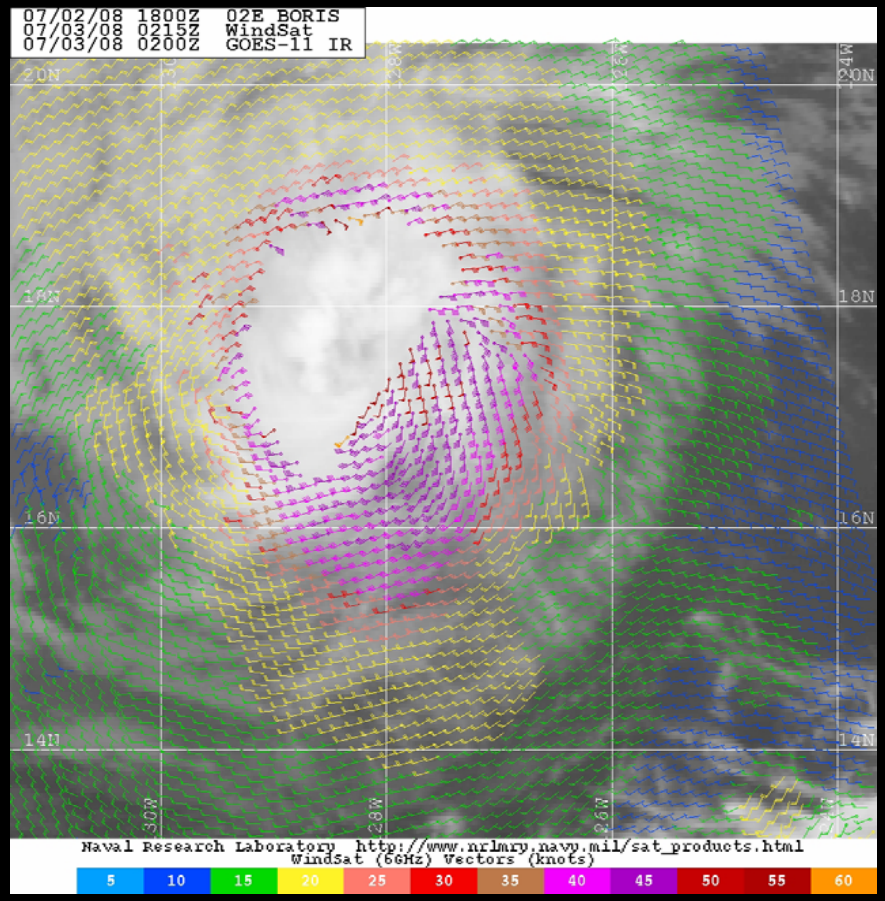
WindSat/*Coriolis* Provides Operational Data Products Today

Hurricane Boris - 03 July 2008

Imagery



Wind Field



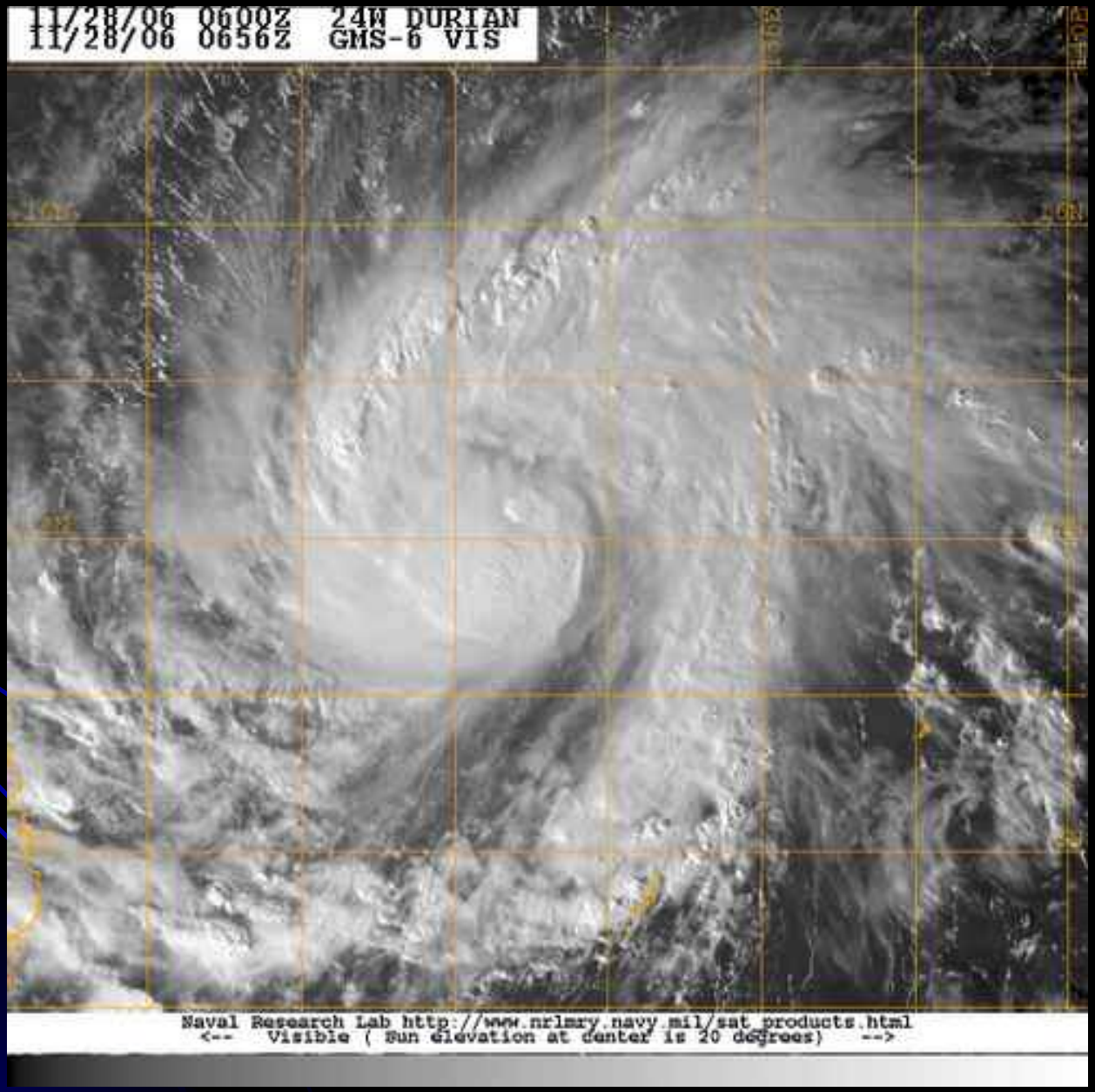
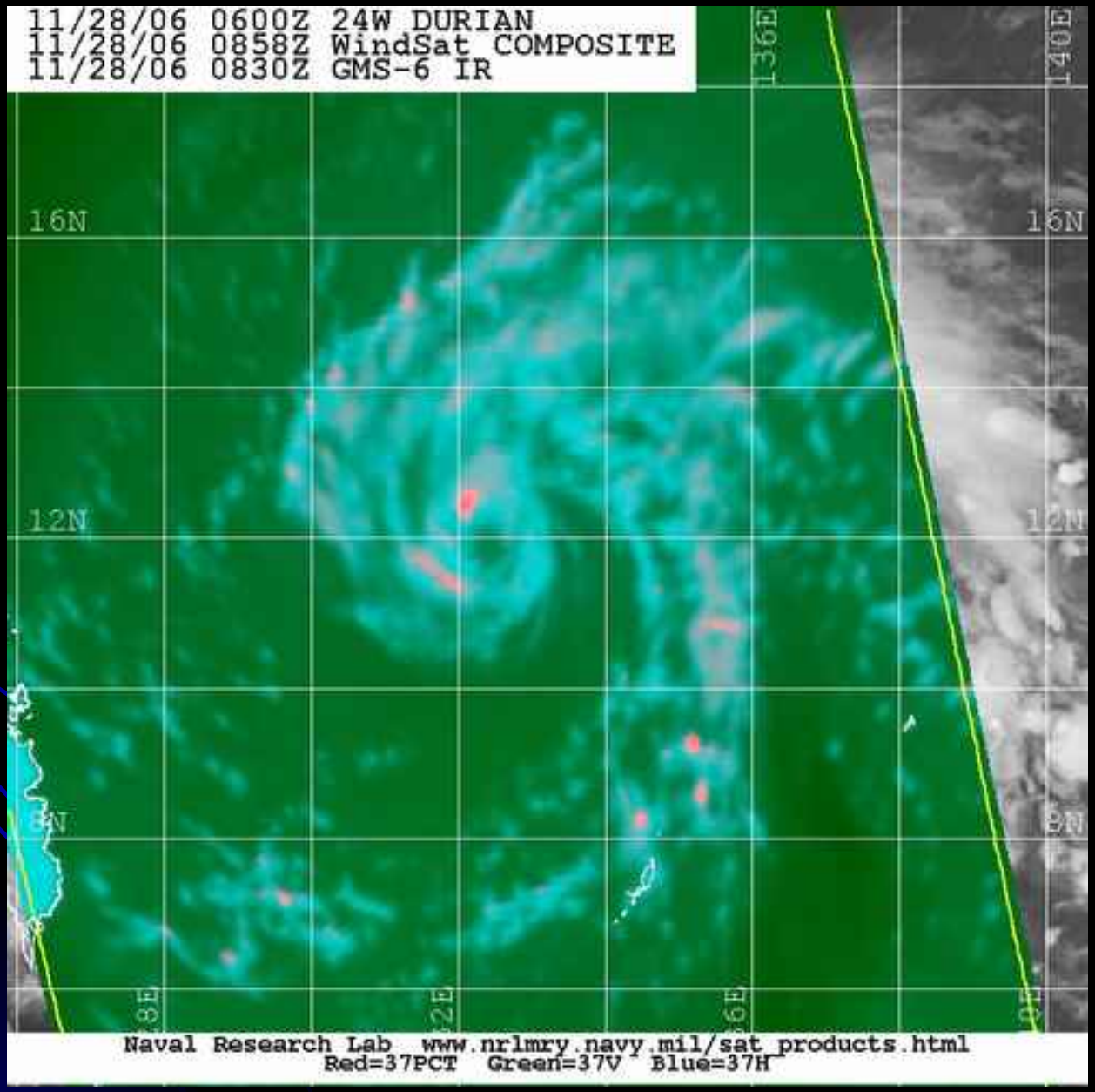
Operational Data Products Generated at FNMOC in Near Real Time
NRL-Monterey Tropical Cyclone Web Page
www.nrlmry.navy.mil/tc_pages

Conclusions

- We've previewed products/imagery from just two NPOESS Instruments
- VIIRS and MIS are both "Imagers" but both yield quantitative data (retrievals) as well
- In the NPOESS era forecasters will be able to obtain products and images much more quickly than in the present

Additional Slides

Typhoon Durian, GMS Visible



Typhoon Durian, WindSat 37 GHz