A Preview of Forecaster Imaging Applications from NPOESS

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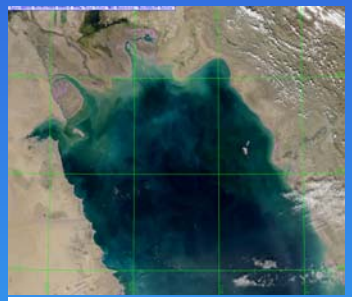
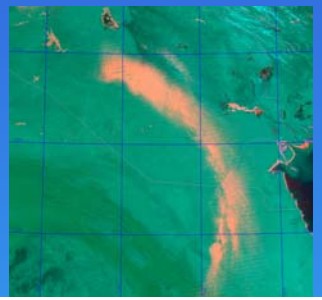
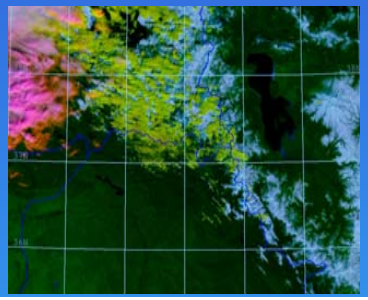
NRL's Role in Weather Satellite

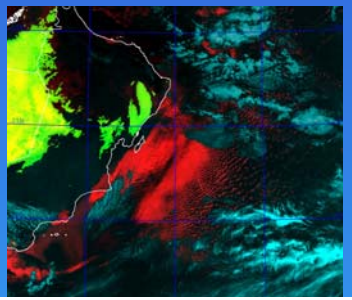
Past and present:

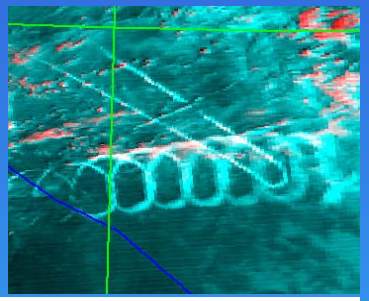
- Provide generic and experimental products
- Since 9/11: state of the art, MODIS-driven products


true color


desert dust


snow/cloud discriminator

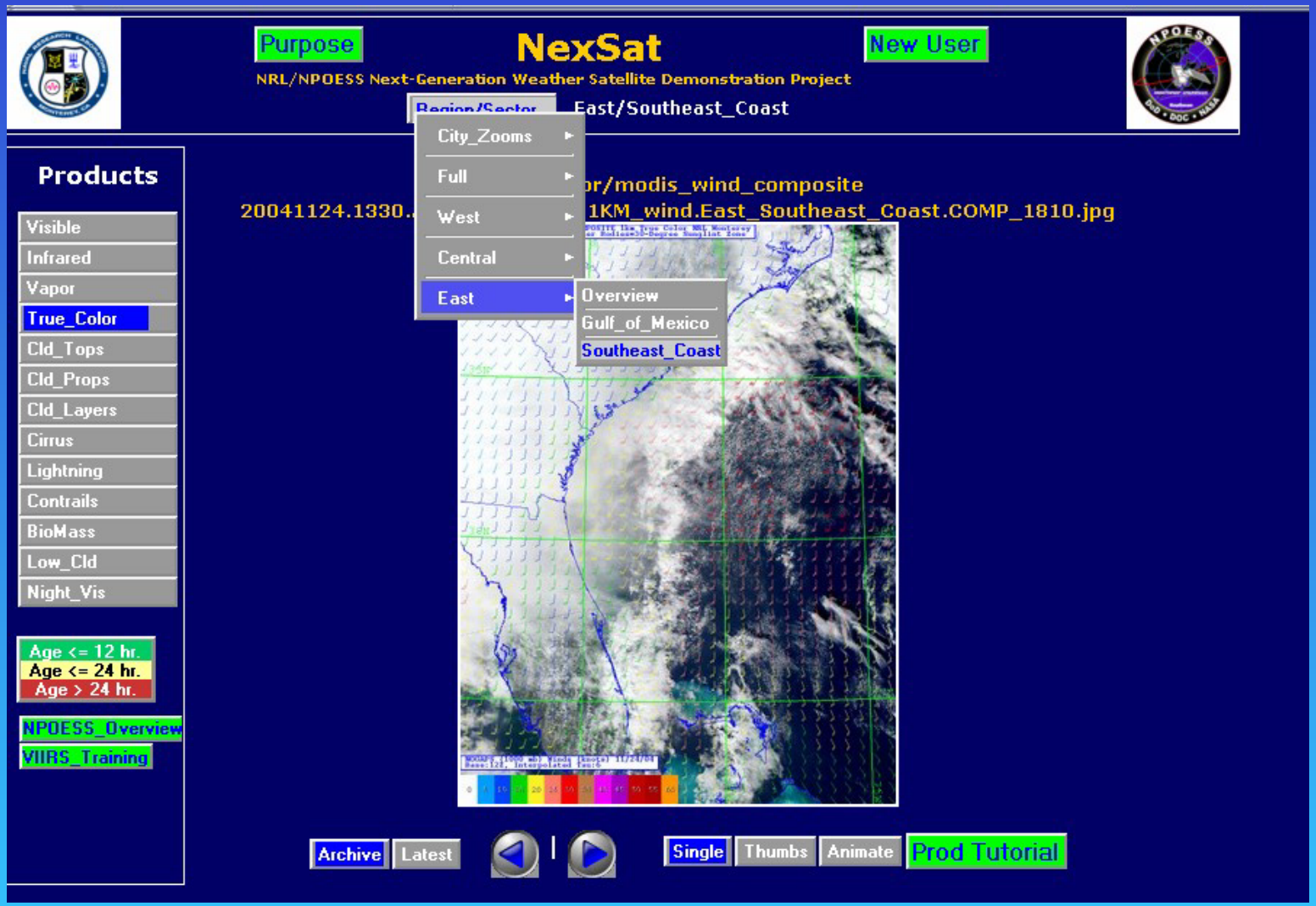

nighttime low cloud


aircraft contrails

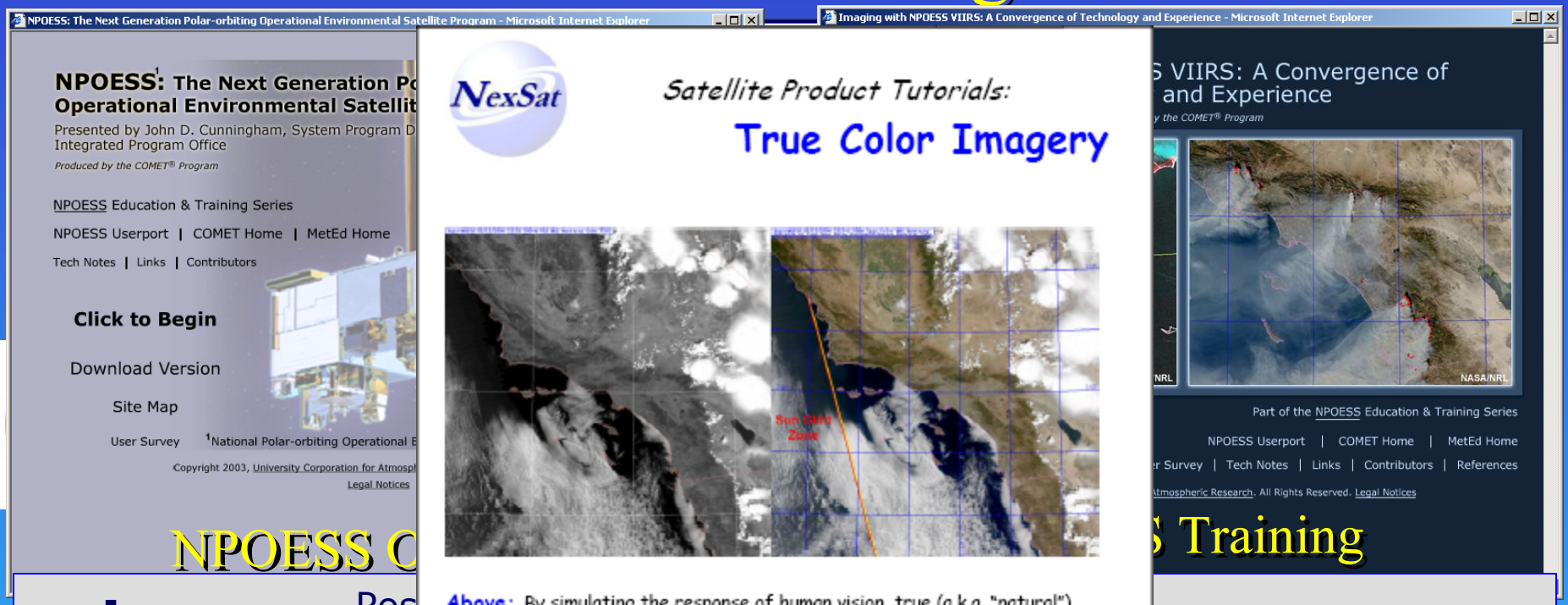
NPP/NPOESS era: "NexSat"

- Demonstrates VIIRS capabilities
- Near-real time display of products
- Educational resources

Navigating *NexSat*



NexSat: Online Training



NPOESS C… Training

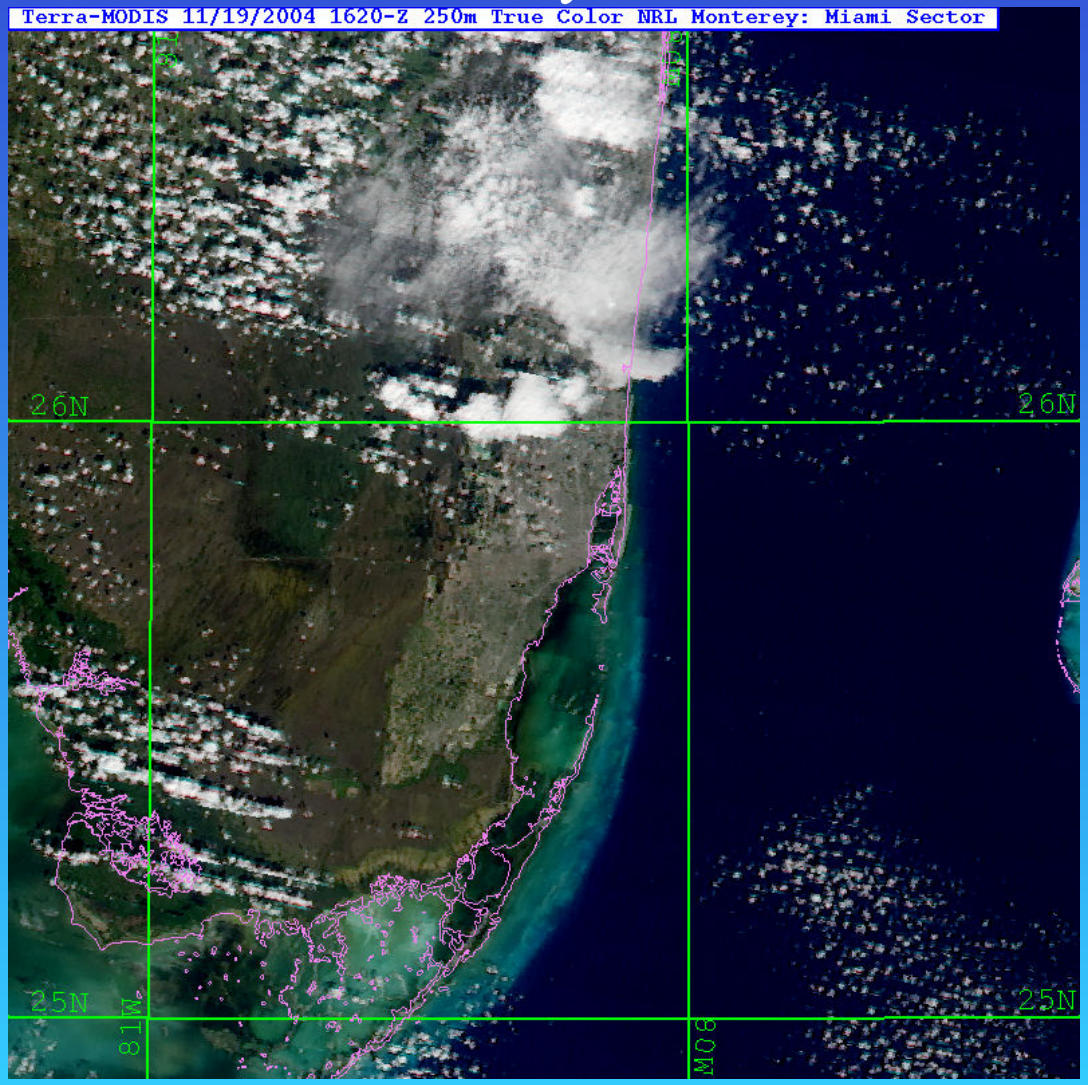
- Pos…
- NRL…
- App…
- Spo…

…ists

- **Trains users with … t-forward illustrative examples**
- **Describes how pr… ure NPOESS/VIIRS capabilities.**

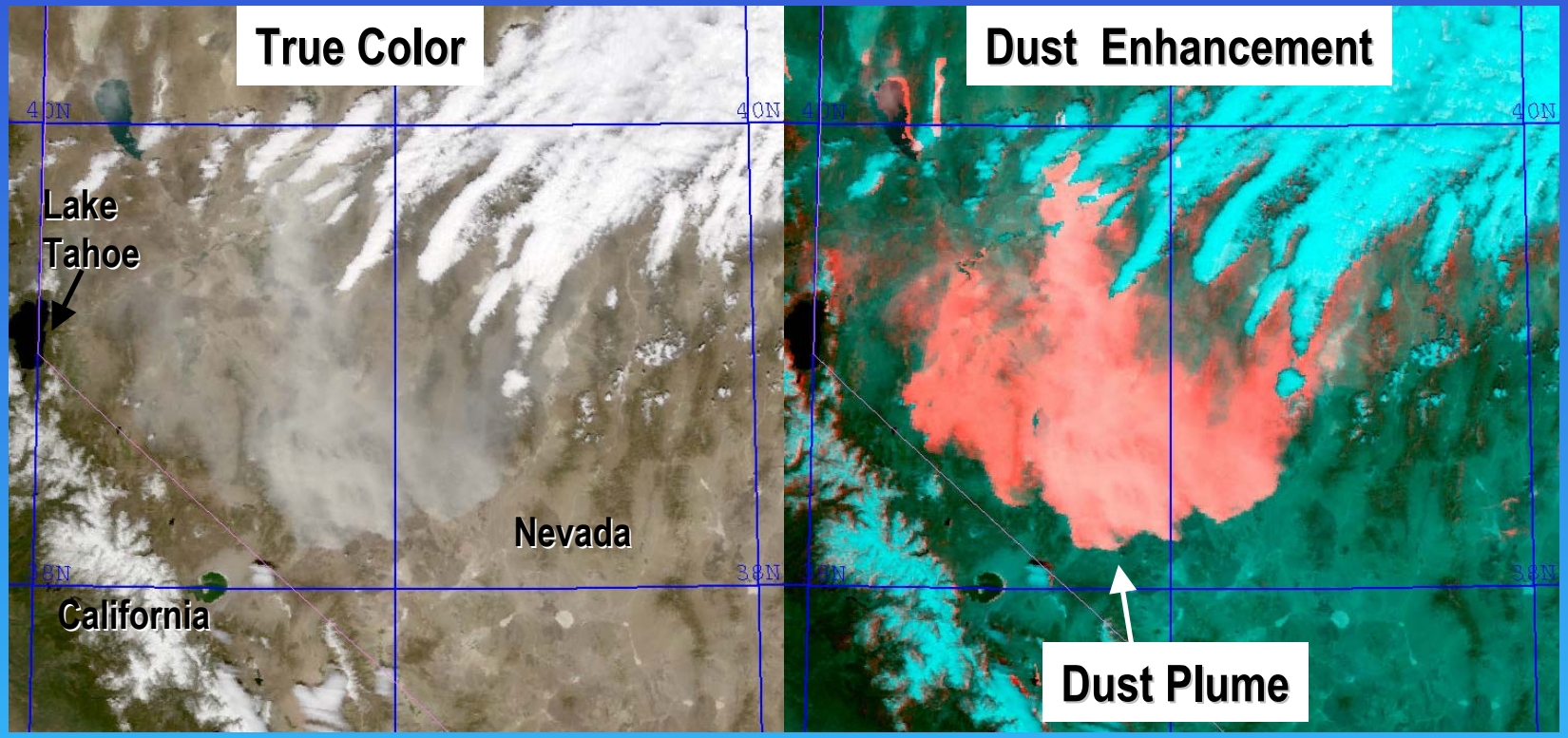
NexSat Product Examples

250 m City Zooms



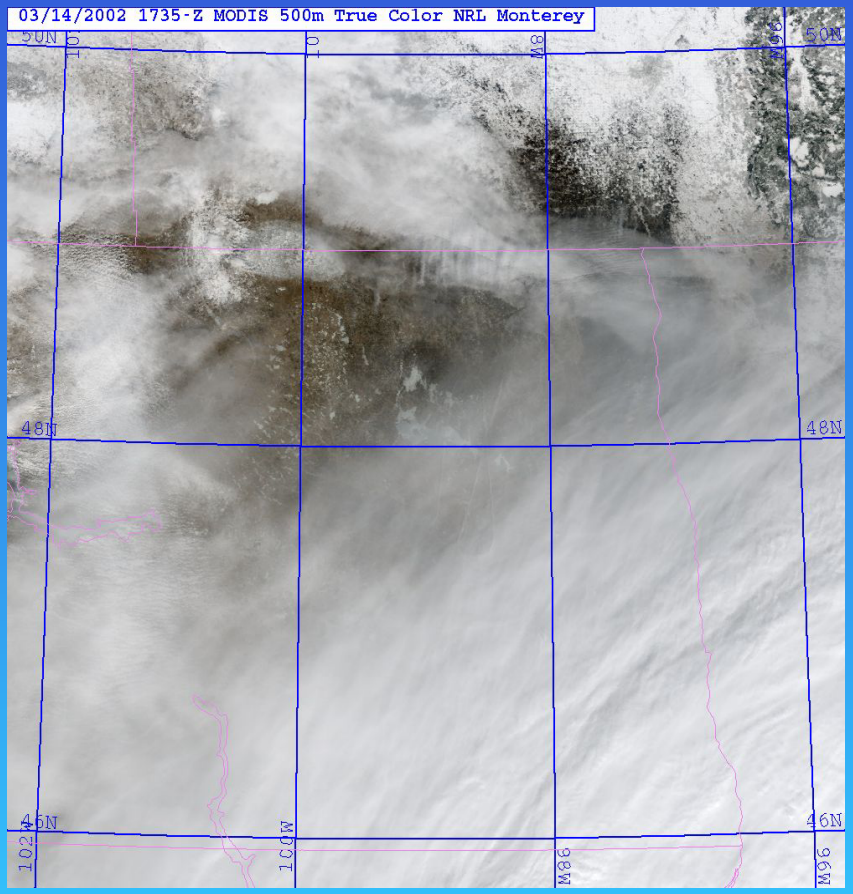
NexSat Product Examples

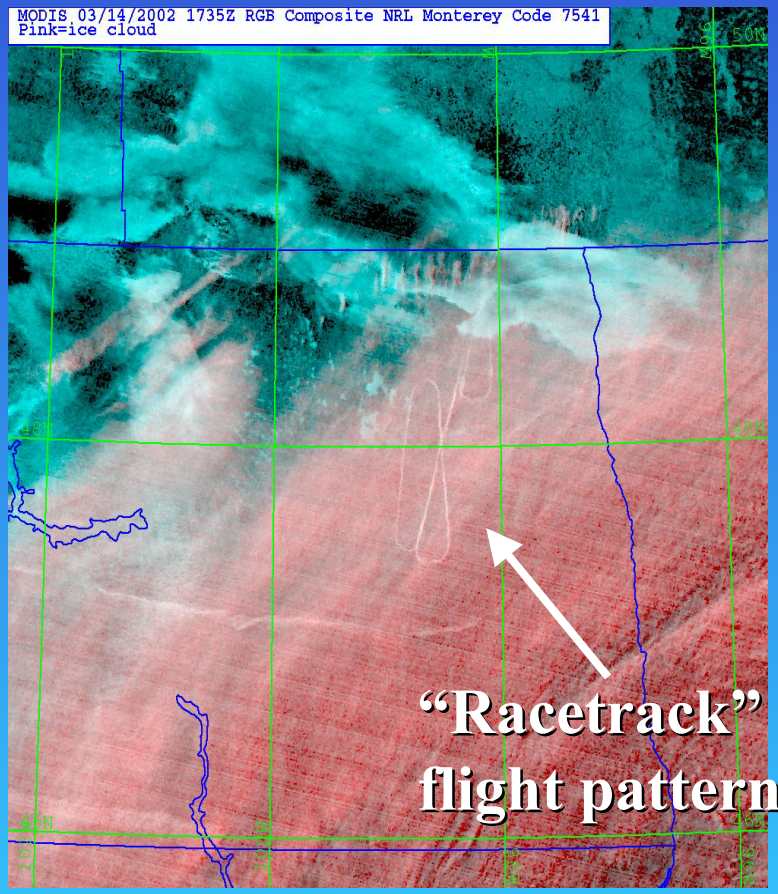
Dust Detection



NexSat Product Examples

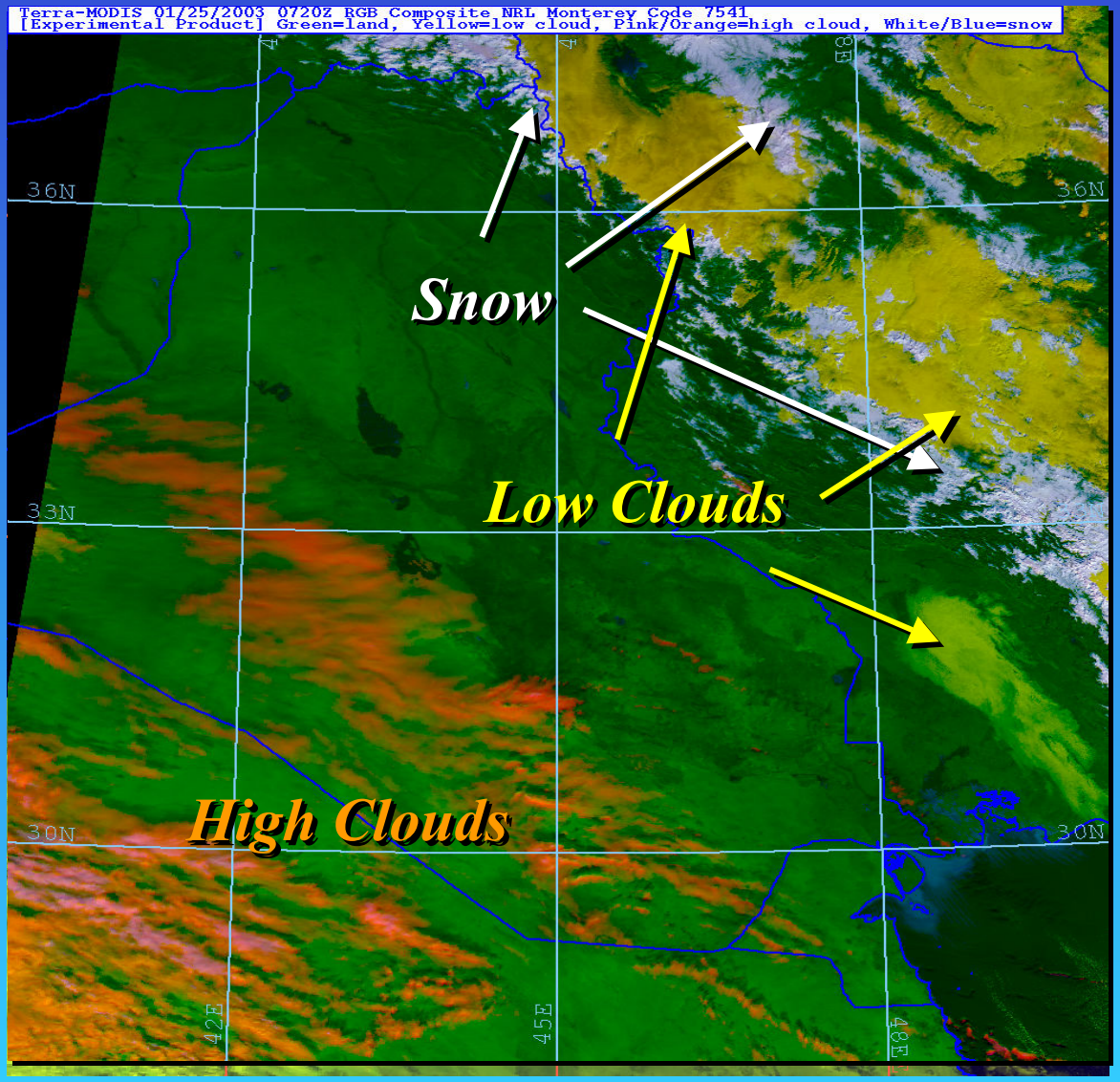
Aircraft Contrails





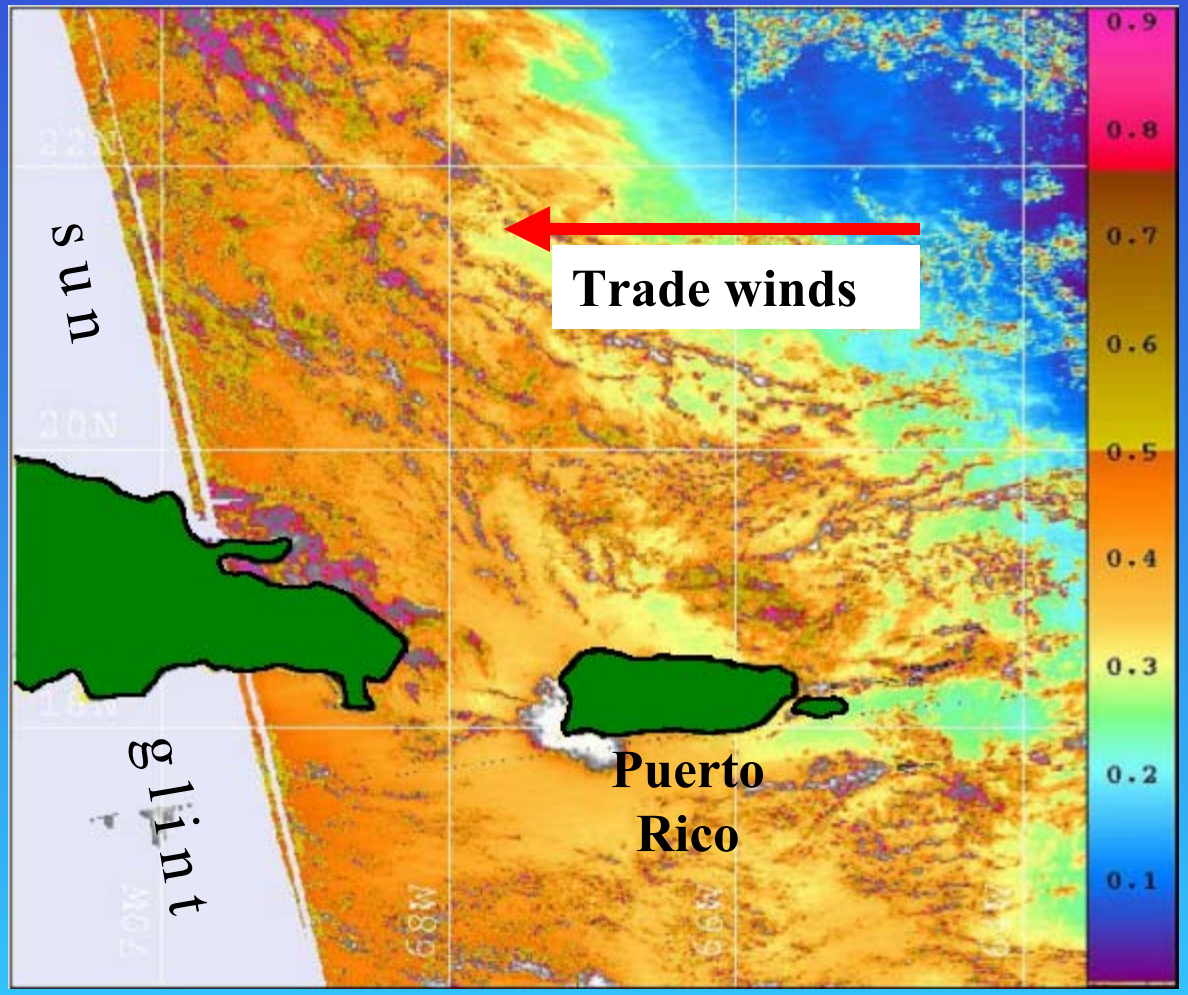
NexSat Product Examples

Cloud/Snow Discrimination



NexSat Product Examples

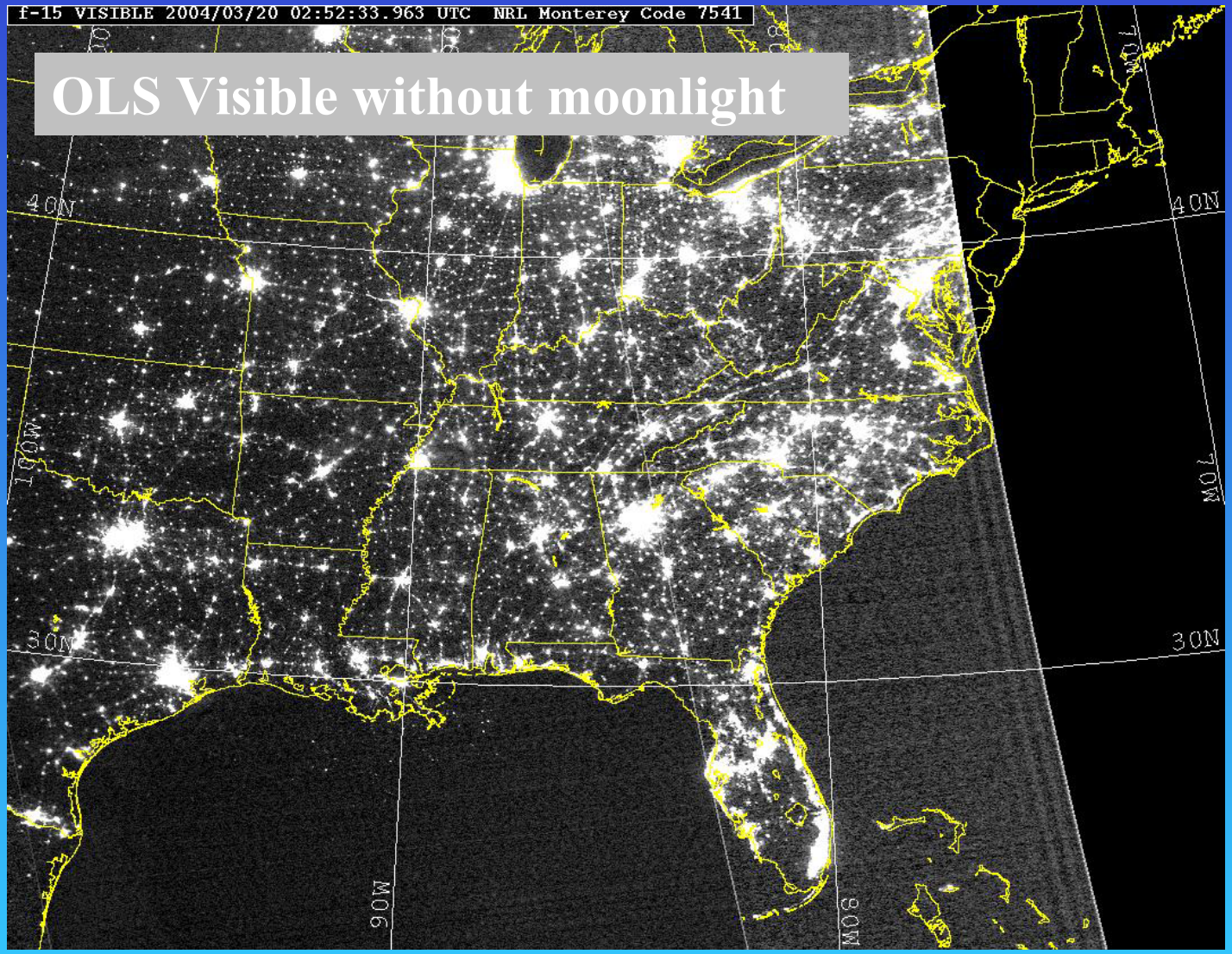
Tracking Saharan Dust using MODIS



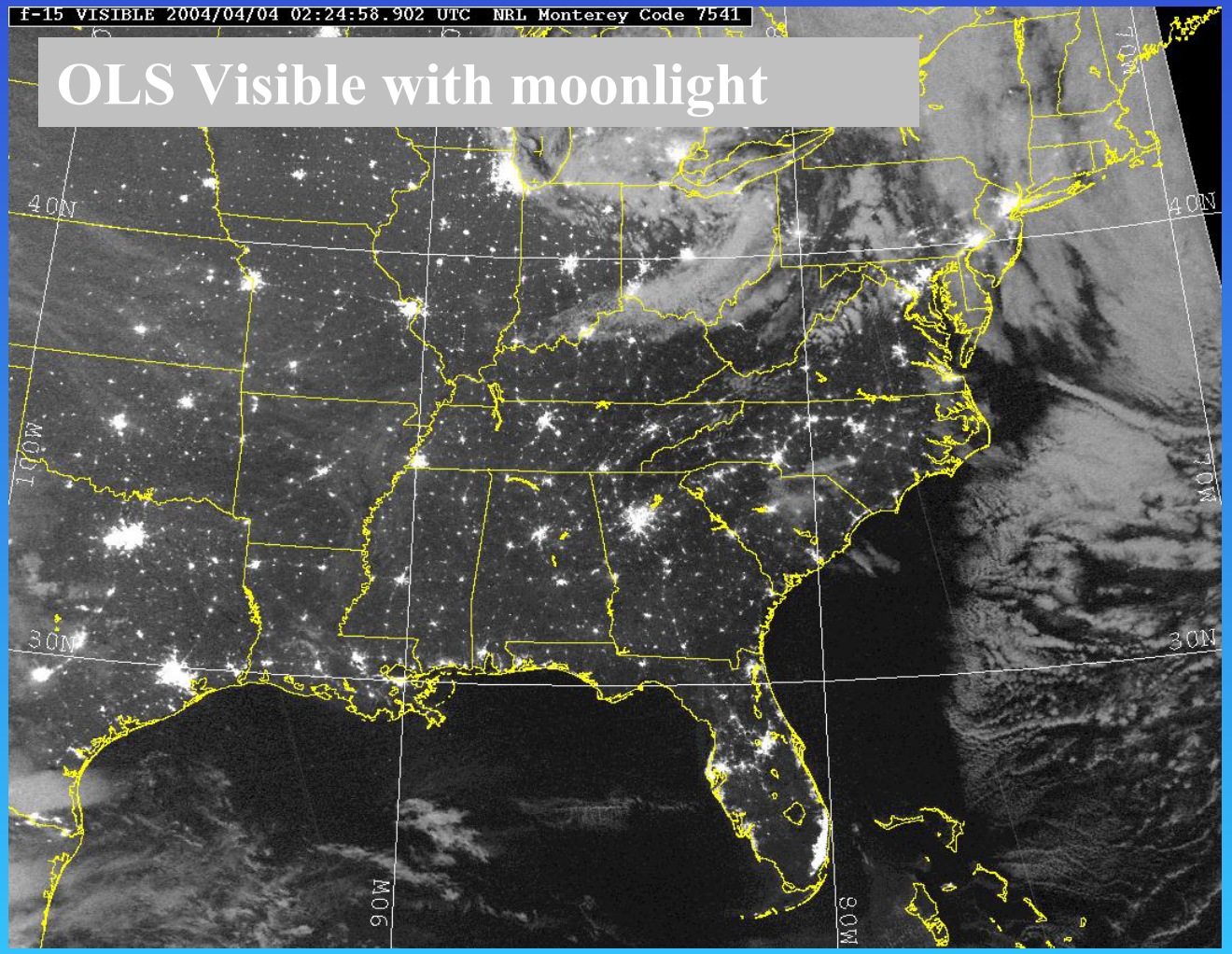
VIIRS DayNight Band (DNB)

- Purpose: Replicate DMSP OLS Capability but with updated technology, especially including nighttime visible capabilities
- 0.5 -- 0.9 μm Broadband Visible
- 4096 gray shades vs 64 in DMSP OLS vis
- Reduced artifacts to provide smooth transition between day/night scenes

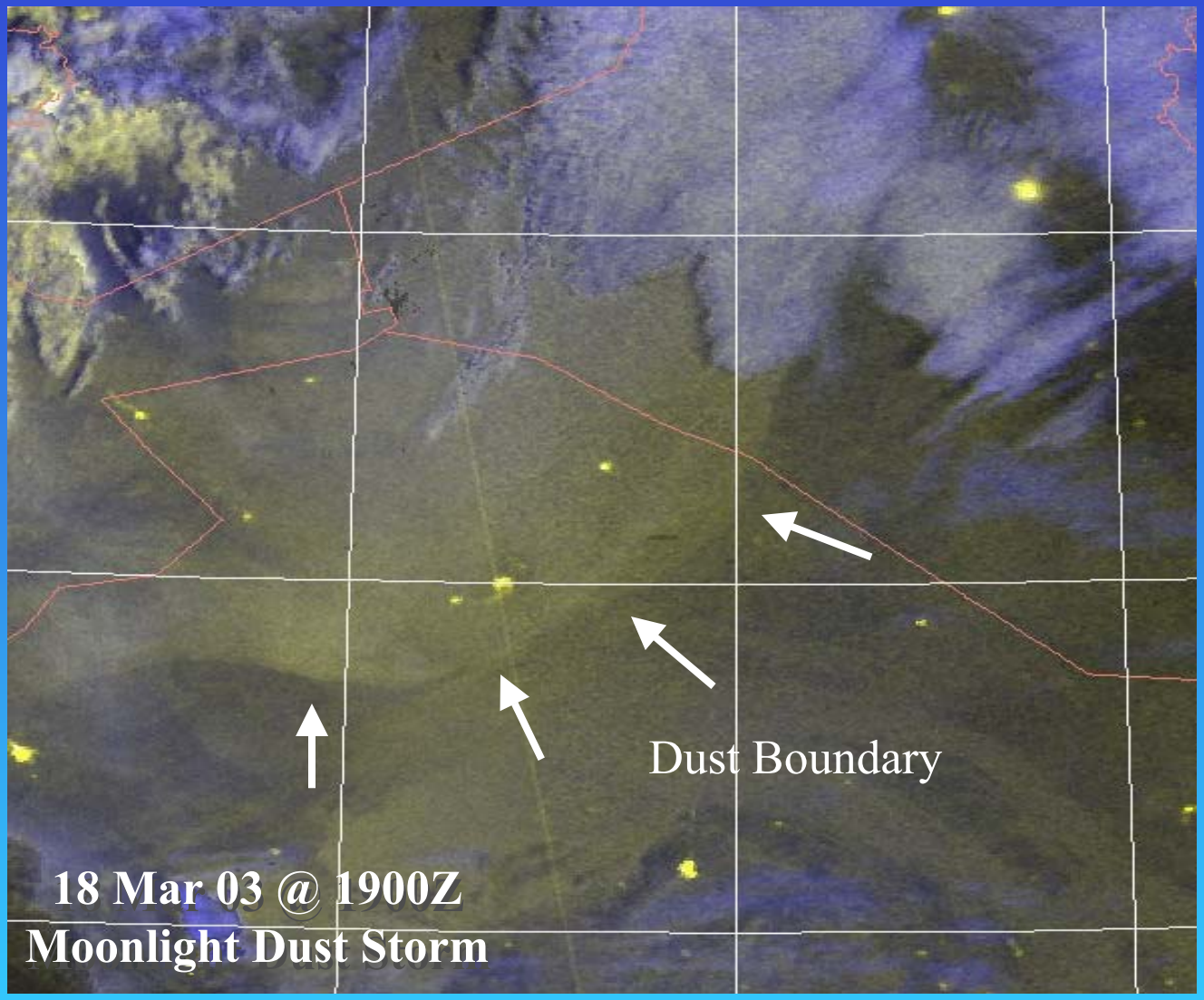
DMSP Nighttime Detection City Lights



DMSP Nighttime Detection City Lights and clouds

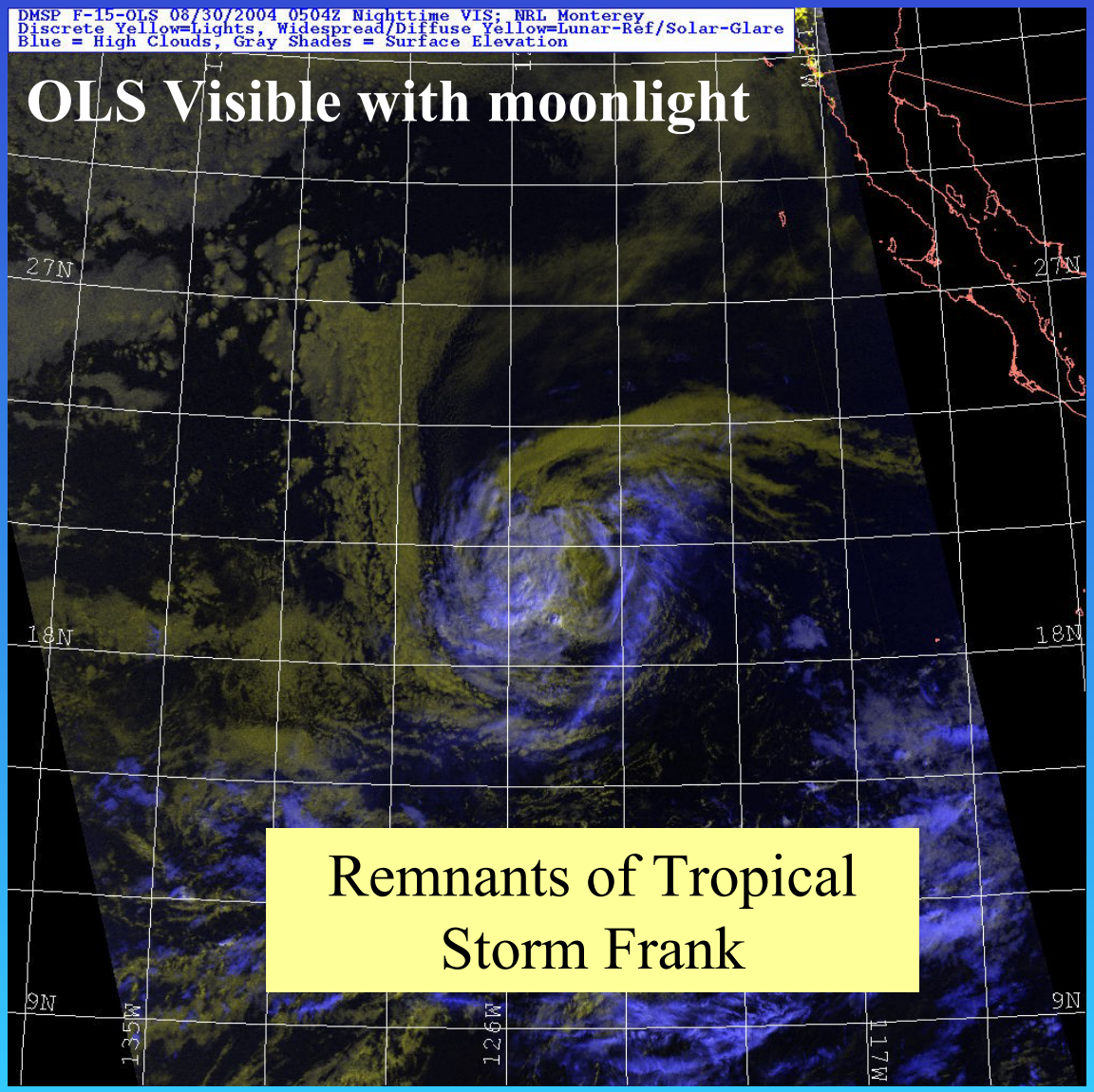


DMSP (F15) Nighttime Visible

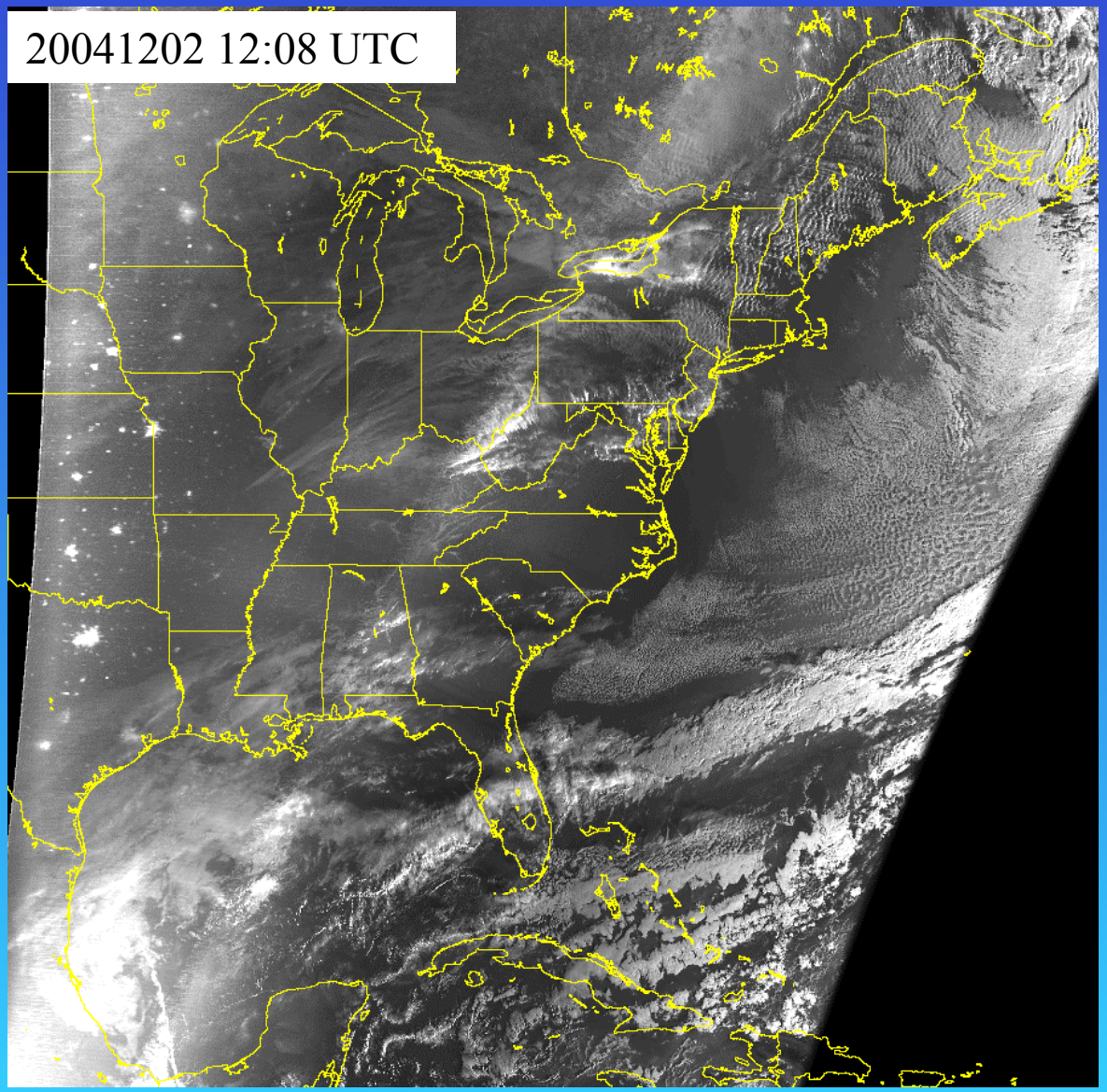


Courtesy: Steve Miller and Tom Lee, NRL

Low Clouds Via Lunar Reflection



DMSP (F13) Terminator Image



Comparing Pixel Sampling

Wavelength	AVHRR	VIIRS	
.63 µm			Imagery, Clouds, Snow, Dust
.86 µm			Terrain, vegetation, water
1.6 µm			Snow, Cirrus Properties
3.7 µm			Low Clouds, SST
10.8 µm			Images, Cloud height, SST
11.8 µm			Volcanic Ash, Split Window

.37 km

1.1 km

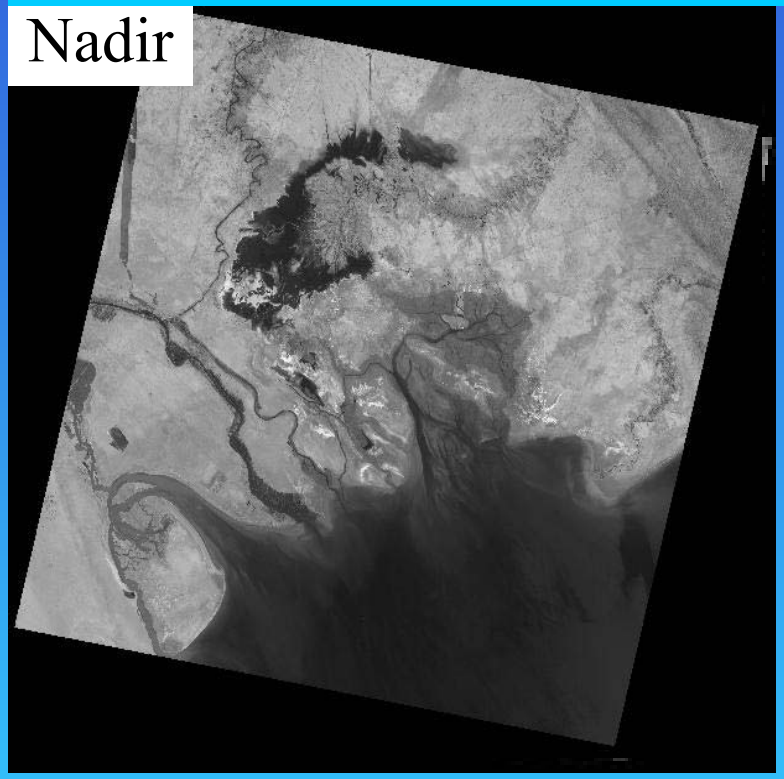
.74 km

VIIRS has 22 channels in all, 4096 gray shades vs 1024

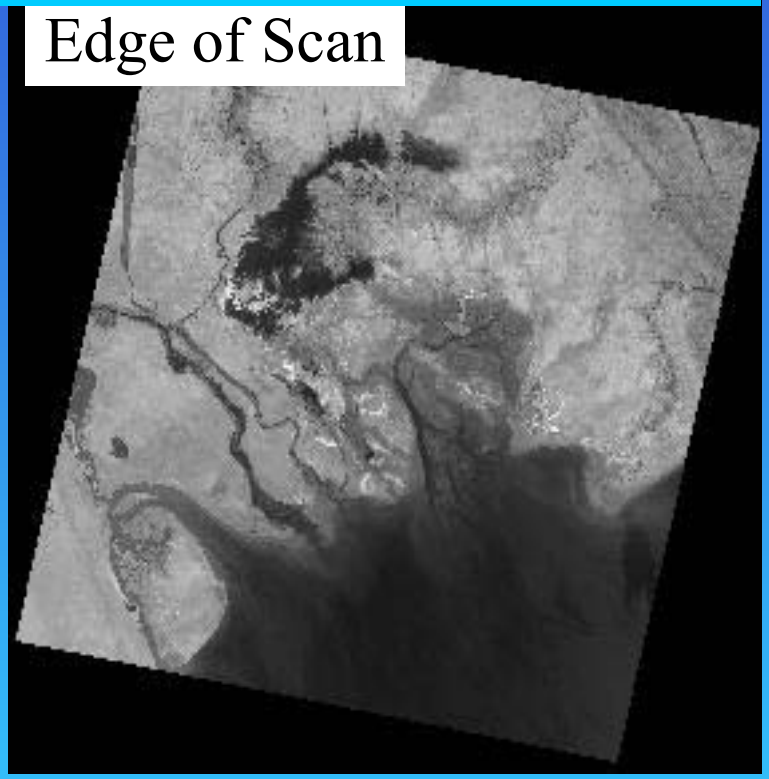
Comparisons of Pixel Sampling

VIIRS VISIBLE SIMULATION

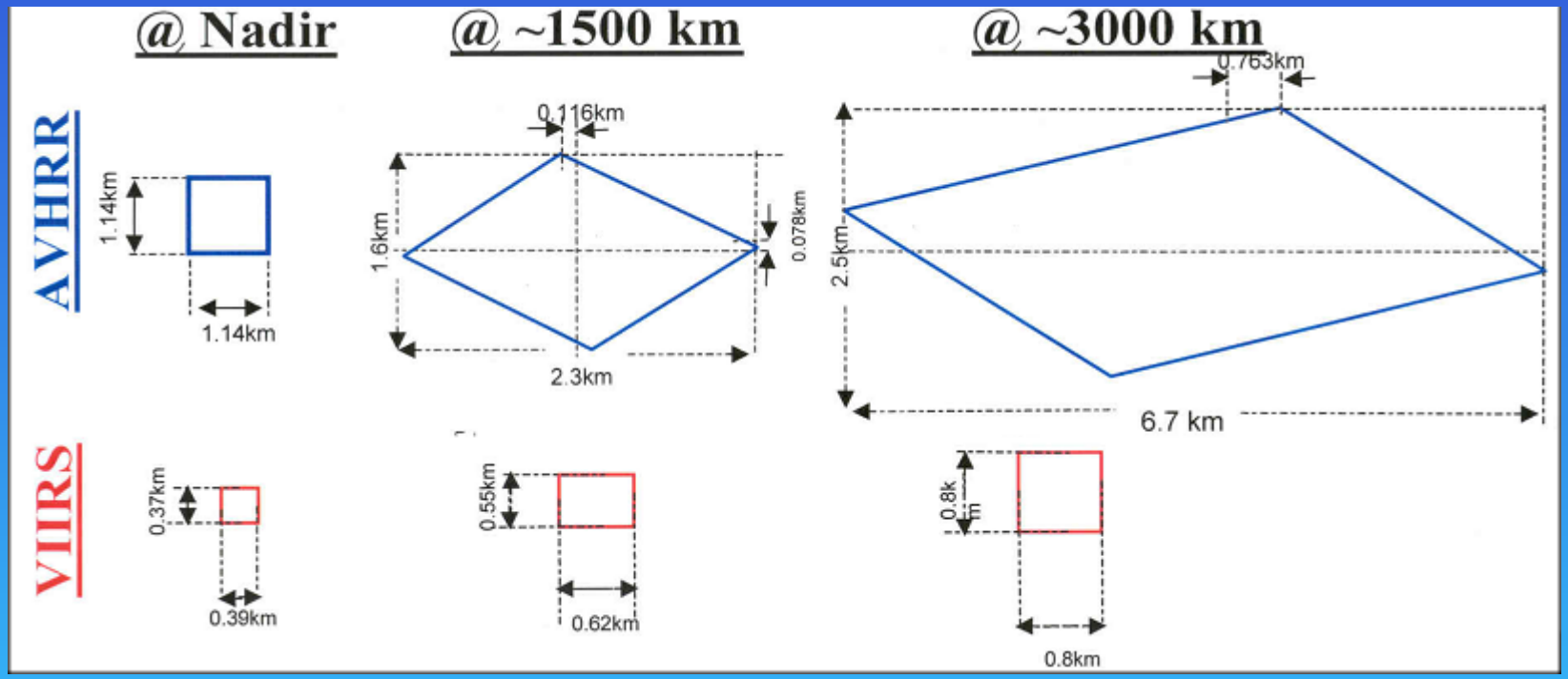
Nadir



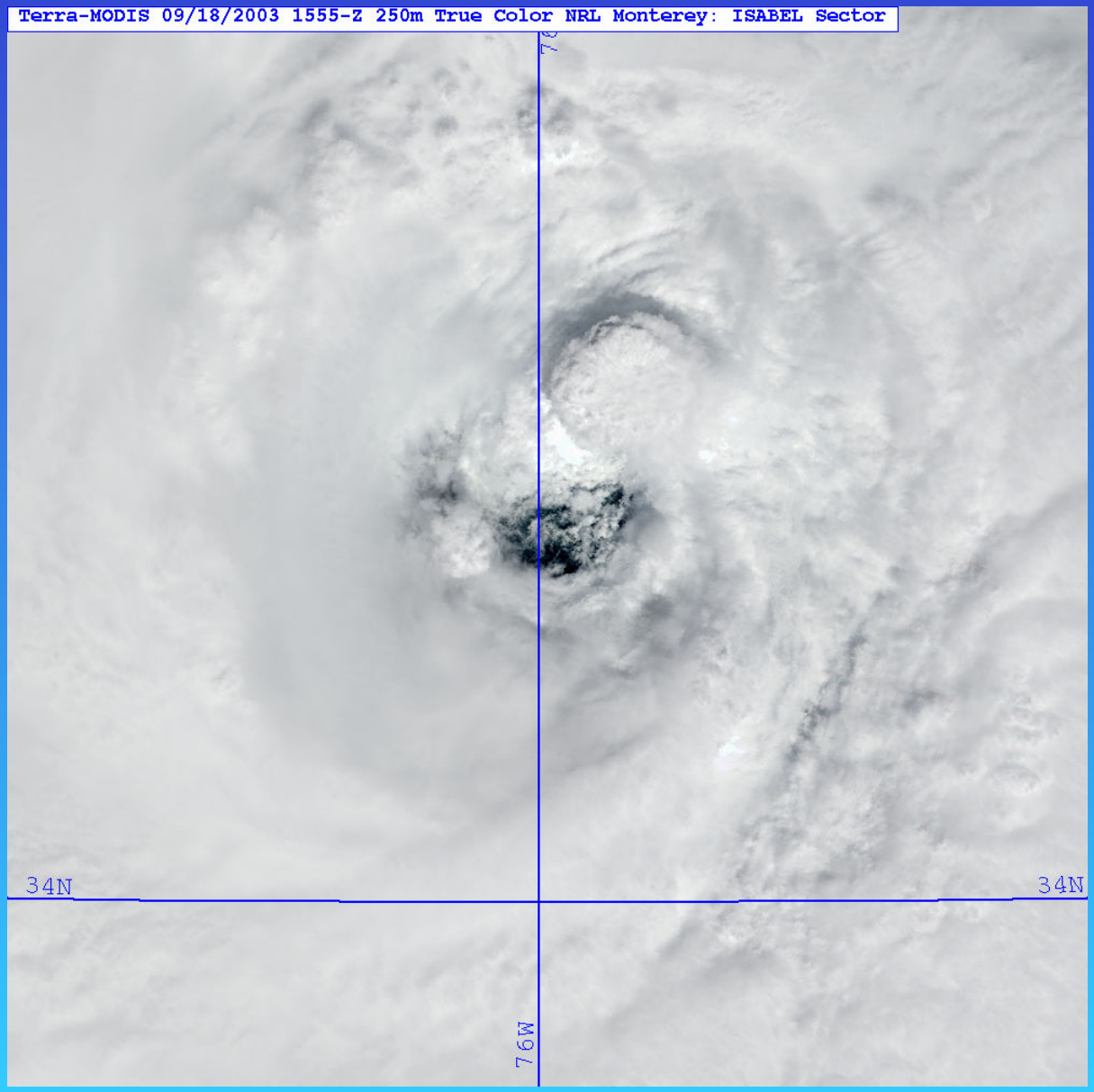
Edge of Scan



Comparisons of Pixel Sampling



Improved Spatial Resolution

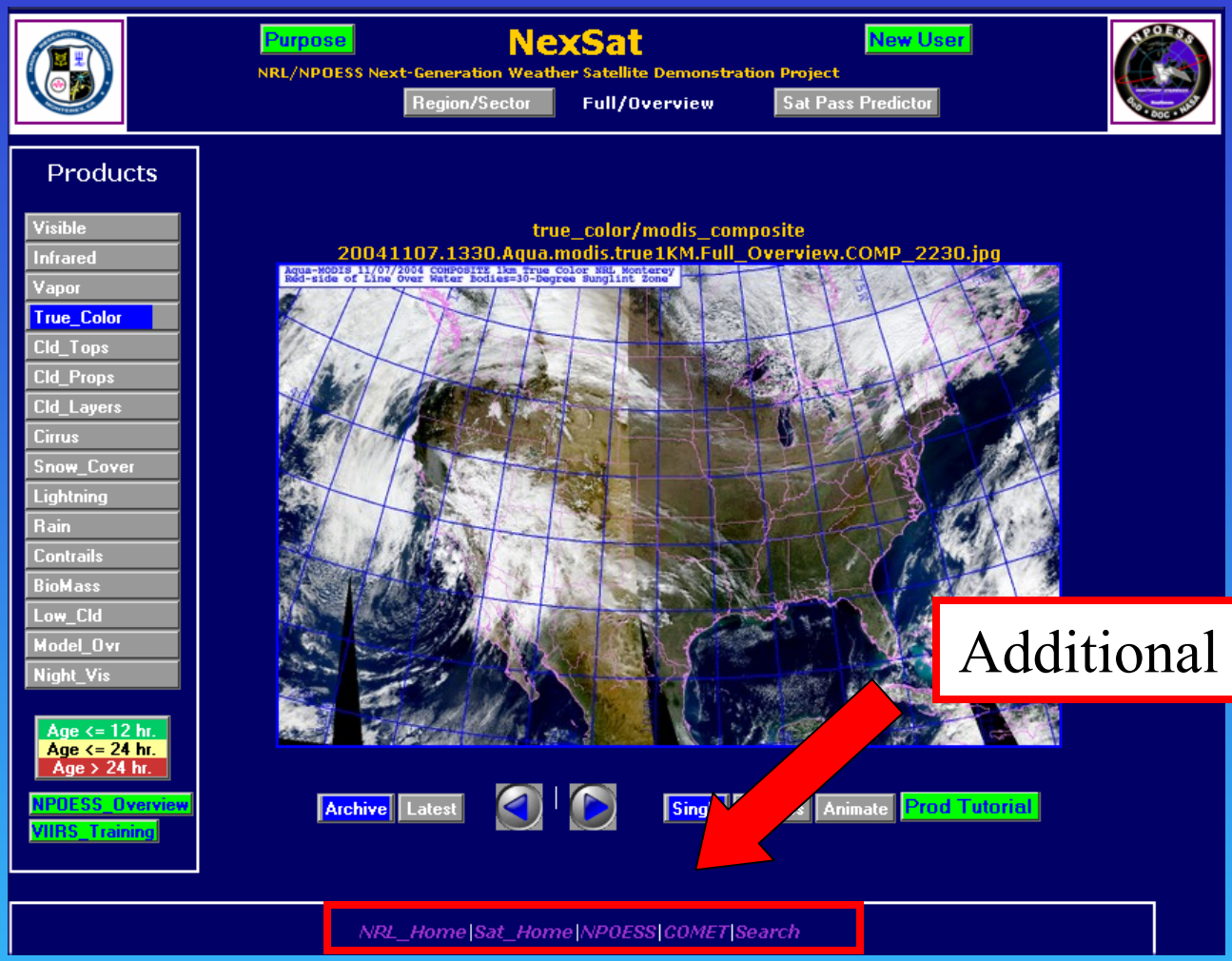


MODIS

Hurricane

Isabel

Further Information



Additional Links

http://www.nrlmry.navy.mil/nexsat_pages/nexsat_home.html

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NexSat Web Page

Purpose | **NexSat** | New User

NRL/NPOESS Next-Generation Weather Satellite Demonstration Project

Region/Sector | Full/Overview | Sat Pass Predictor

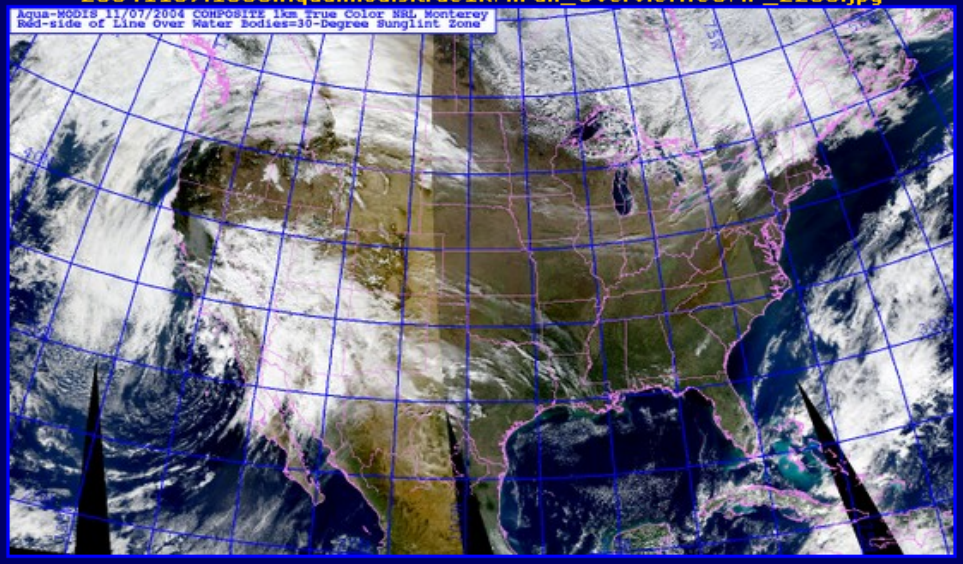
Products

- Visible
- Infrared
- Vapor
- True_Color
- Cld_Tops
- Cld_Props
- Cld_Layers
- Cirrus
- Snow_Cover
- Lightning
- Rain
- Contrails
- BioMass
- Low_Cld
- Model_Ovr
- Night_Vis

Age <= 12 hr.
Age <= 24 hr.
Age > 24 hr.

NPOESS_Overview
VIIRS_Training

true_color/modis_composite
20041107.1330.Aqua.modis.true1KM.Full_Overview.COMP_2230.jpg



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http://www.nrlmry.navy.mil/nexsat_pages/nexsat_home.html

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