Future GOES

(XGOHI, GOES-13/O/P, GOES-R+)

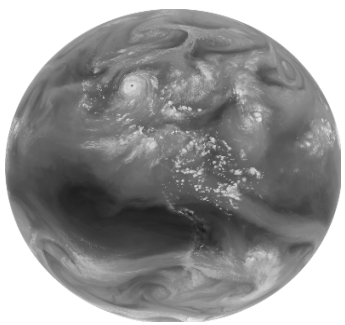
Timothy J. Schmit

NOAA/NESDIS/Satellite Applications and Research

Advanced Satellite Products Branch (ASPB)

Madison, WI

And many others

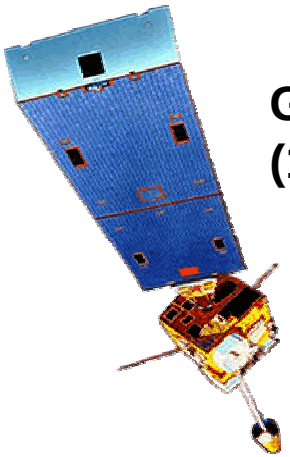


MUG Meeting
October 16, 2007

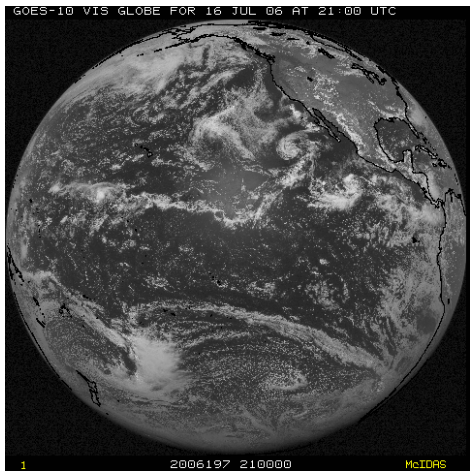
UW-Madison

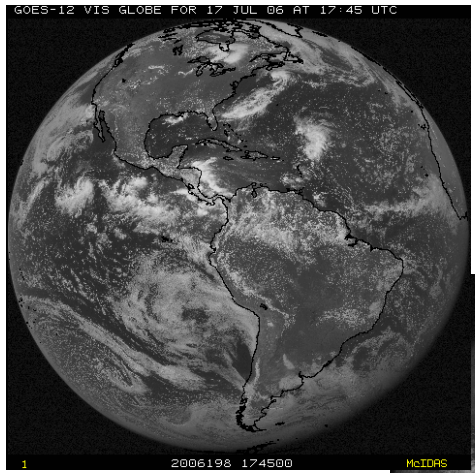
GOES Constellation

Operational

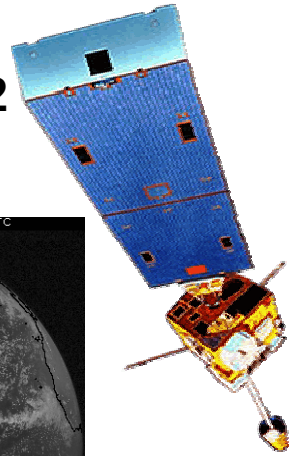


GOES-11
(135W)

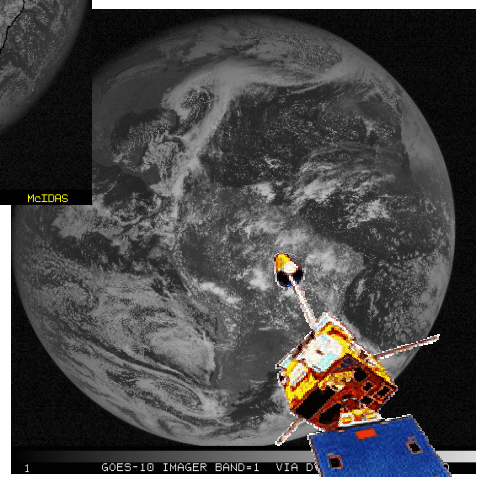


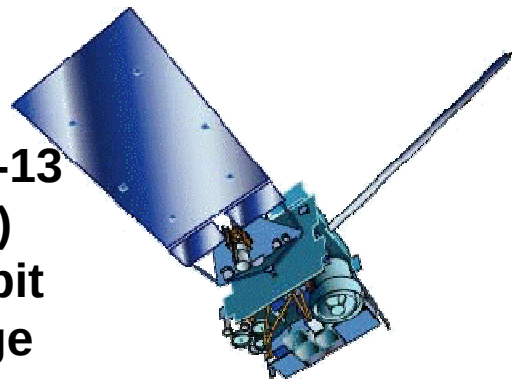


GOES-12
(75W)

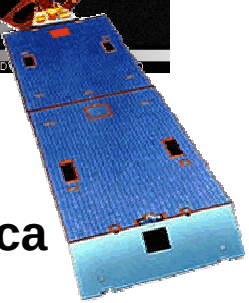


Operational





GOES-13
(105W)
On-orbit
Storage

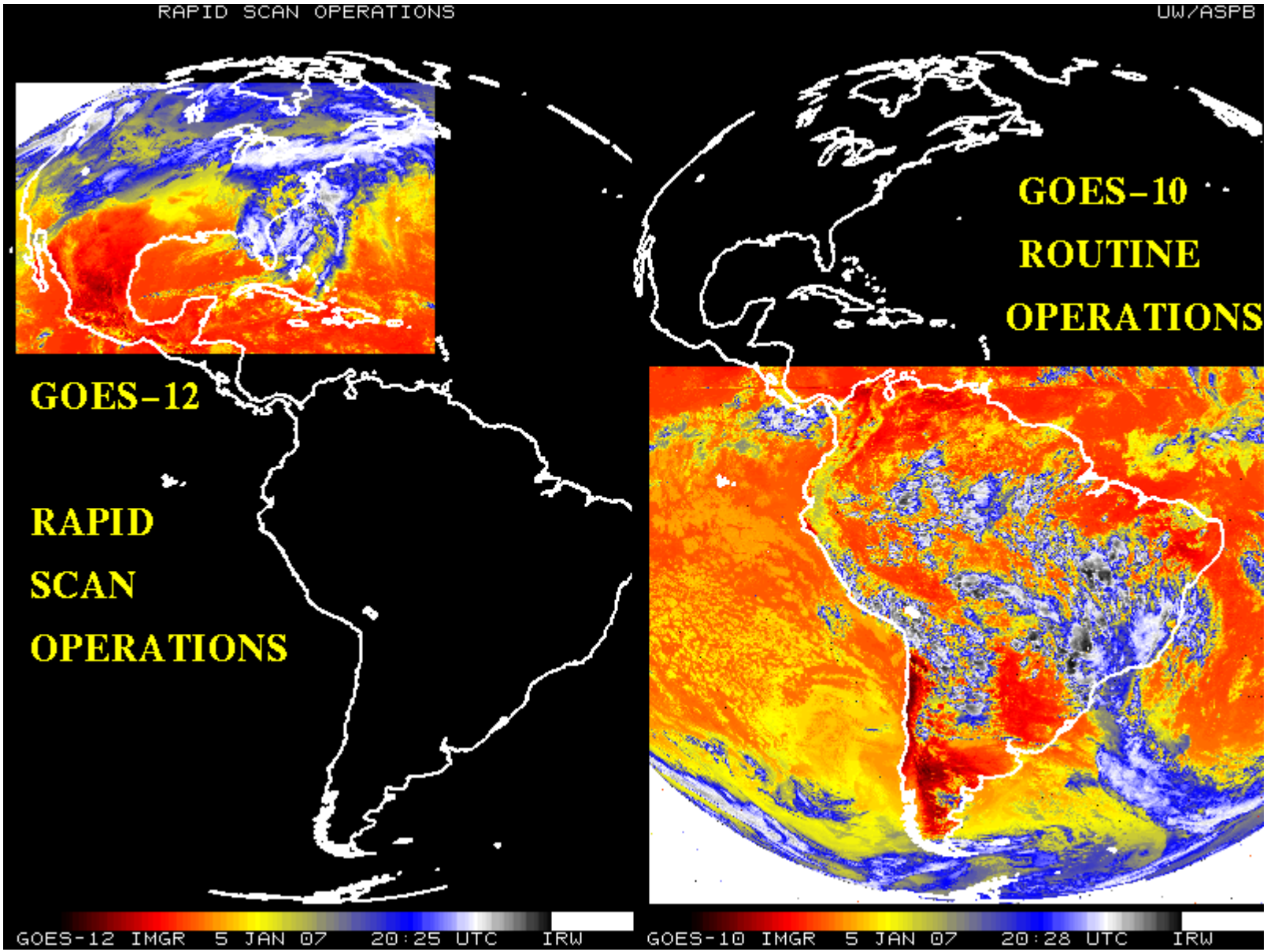


GOES-10
(60W)
South America

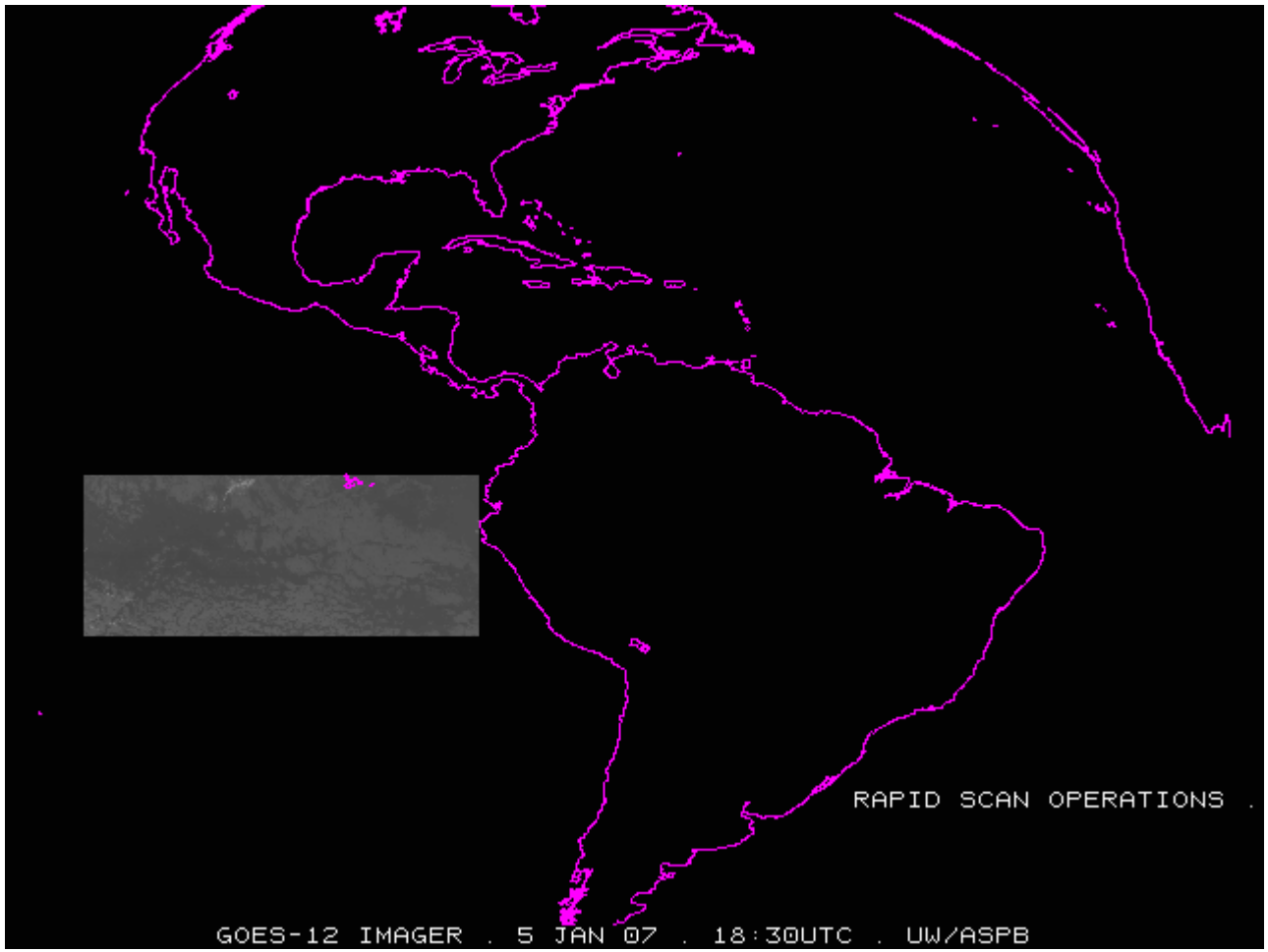
Outline

- GOES-10
  - SH support
  - XGOHI
- GOES-13
- GOES-O/P
  - 13.3 µm change
- GOES-R
  - Schedule
  - ABI
  - Intro GLM

GOES-12 and GOES-10

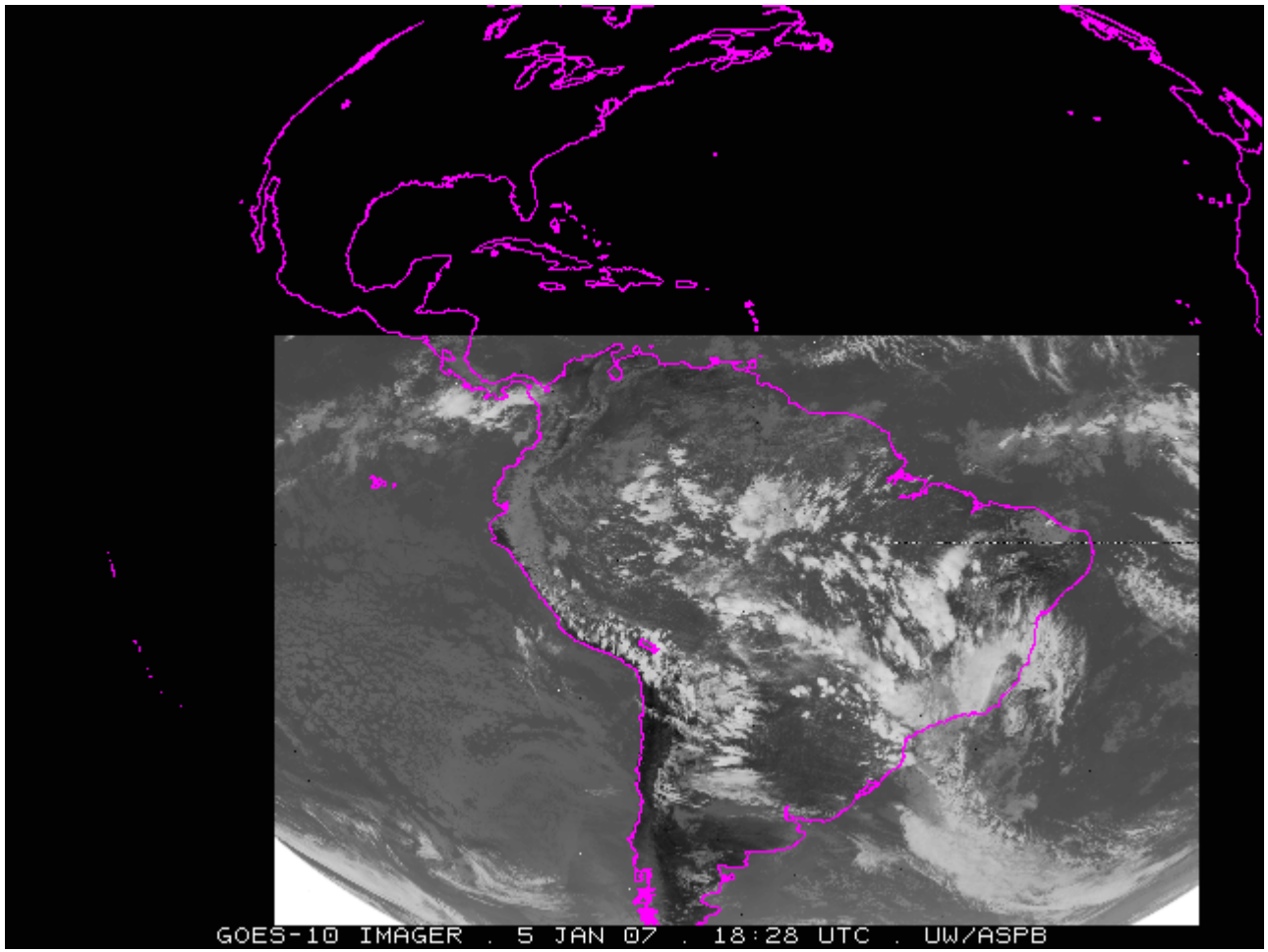


GOES-12 Imager during RSO

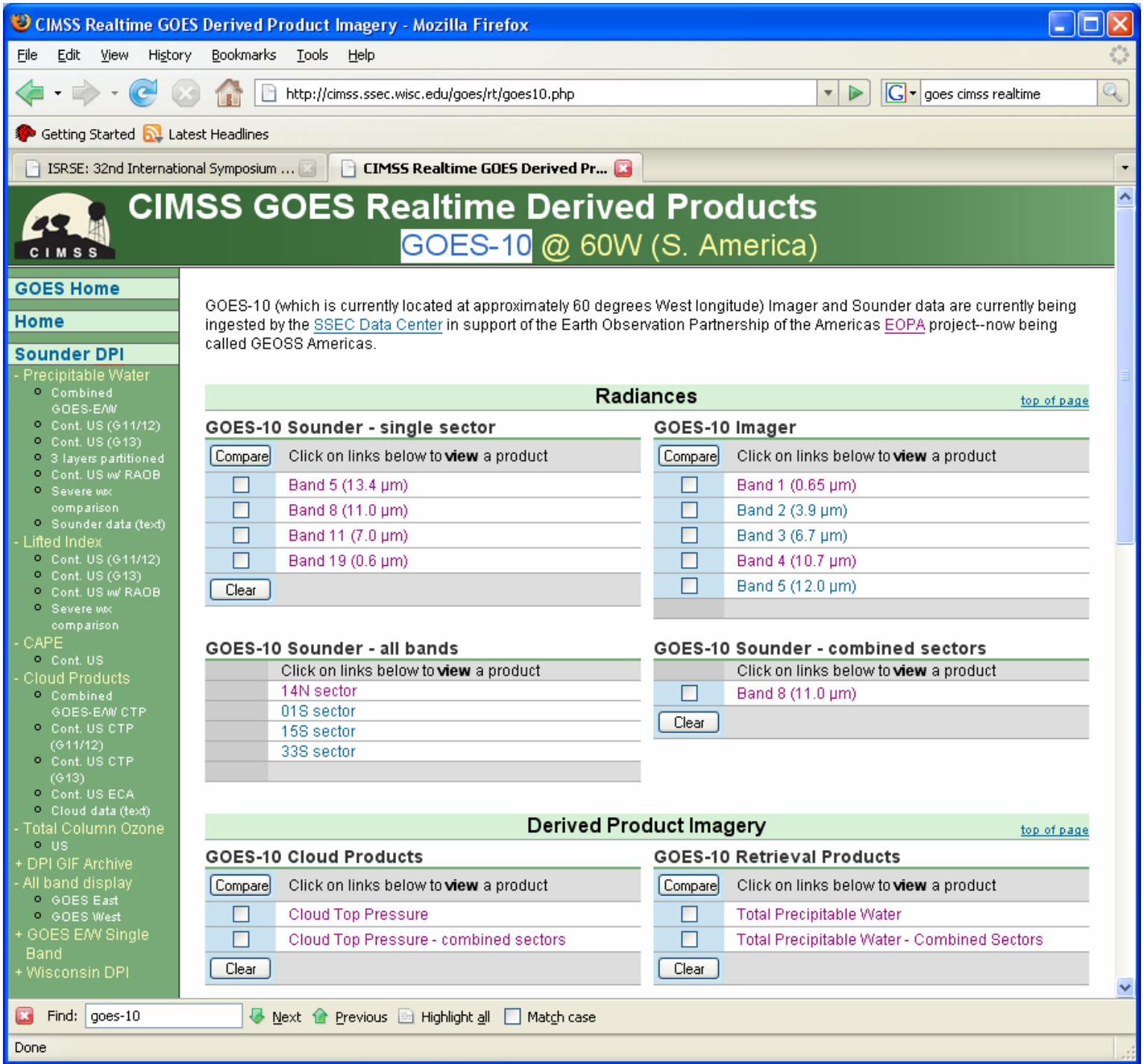


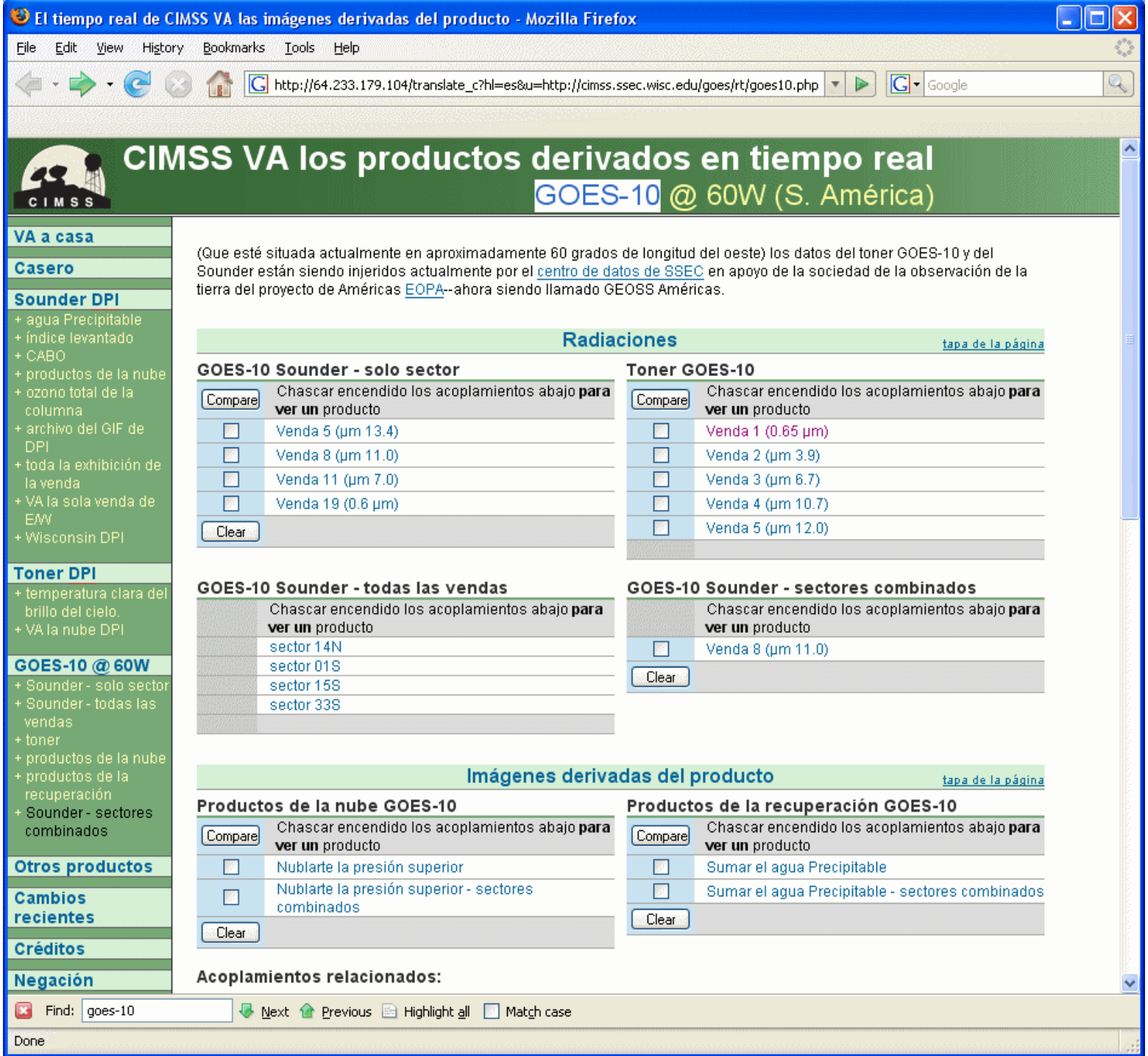
When the GOES-12 Imager is in Rapid Scan Operations, the region over South America is only scanned every 3 hours. This animation runs from 18:30 UTC to 23:02 UTC on January 5, 2007.

GOES-10 Imager



The GOES-10 Imager routinely (every 15 or 30 minutes) scans the Southern Hemisphere. This is especially important when GOES-12 is in rapid-scan mode. This animation runs from 18:28 UTC to 22:58 UTC on January 5, 2007.


CIMSS Realtime GOES Derived Product Imagery - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://cimss.ssec.wisc.edu/goes/rt/goes10.php
goes cimss realtime
Getting Started Latest Headlines
ISRSE: 32nd International Symposium ...
CIMSS Realtime GOES Derived Pr...
CIMSS GOES Realtime Derived Products
GOES-10 @ 60W (S. America)
GOES Home
Home
Sounder DPI
- Precipitable Water
Combined GOES-E/W
Cont. US (G11/12)
Cont. US (G13)
3 layers partitioned
Cont. US w/ RAOB
Severe wx comparison
Sounder data (text)
- Lifted Index
Cont. US (G11/12)
Cont. US (G13)
Cont. US w/ RAOB
Severe wx comparison
- CAPE
Cont. US
- Cloud Products
Combined GOES-E/W CTP
Cont. US CTP (G11/12)
Cont. US CTP (G13)
Cont. US ECA
Cloud data (text)
- Total Column Ozone
US
+ DPI GIF Archive
- All band display
GOES East
GOES West
+ GOES E/W Single Band
+ Wisconsin DPI
GOES-10 (which is currently located at approximately 60 degrees West longitude) Imager and Sounder data are currently being ingested by the SSEC Data Center in support of the Earth Observation Partnership of the Americas EOPA project--now being called GEOSS Americas.
Radiances
top of page
GOES-10 Sounder - single sector
Compare
Click on links below to view a product
Band 5 (13.4 µm)
Band 8 (11.0 µm)
Band 11 (7.0 µm)
Band 19 (0.6 µm)
Clear
GOES-10 Imager
Compare
Click on links below to view a product
Band 1 (0.65 µm)
Band 2 (3.9 µm)
Band 3 (6.7 µm)
Band 4 (10.7 µm)
Band 5 (12.0 µm)
GOES-10 Sounder - all bands
Click on links below to view a product
14N sector
01S sector
15S sector
33S sector
GOES-10 Sounder - combined sectors
Click on links below to view a product
Band 8 (11.0 µm)
Clear
Derived Product Imagery
top of page
GOES-10 Cloud Products
Compare
Click on links below to view a product
Cloud Top Pressure
Cloud Top Pressure - combined sectors
Clear
GOES-10 Retrieval Products
Compare
Click on links below to view a product
Total Precipitable Water
Total Precipitable Water - Combined Sectors
Clear
Find: goes-10
Next Previous Highlight all Match case
Done


El tiempo real de CIMSS VA las imágenes derivadas del producto - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://64.233.179.104/translate_c?hl=es&u=http://cimss.ssec.wisc.edu/goes/rt/goes10.php
Google
CIMSS
CIMSS VA los productos derivados en tiempo real
GOES-10 @ 60W (S. América)
VA a casa
Casero
Sounder DPI
+ agua Precipitable
+ índice levantado
+ CABO
+ productos de la nube
+ ozono total de la columna
+ archivo del GIF de DPI
+ toda la exhibición de la venda
+ VA la sola venda de E/W
+ Wisconsin DPI
Toner DPI
+ temperatura clara del brillo del cielo.
+ VA la nube DPI
GOES-10 @ 60W
+ Sounder - solo sector
+ Sounder - todas las vendas
+ toner
+ productos de la nube
+ productos de la recuperación
+ Sounder - sectores combinados
Otros productos
Cambios recientes
Créditos
Negación
(Que esté situada actualmente en aproximadamente 60 grados de longitud del oeste) los datos del toner GOES-10 y del Sounder están siendo injeridos actualmente por el centro de datos de SSEC en apoyo de la sociedad de la observación de la tierra del proyecto de Américas EOPA--ahora siendo llamado GEOSS Américas.
Radiaciones
tapa de la página
GOES-10 Sounder - solo sector
Compare
Chascar encendido los acoplamientos abajo para ver un producto
Venda 5 (µm 13.4)
Venda 8 (µm 11.0)
Venda 11 (µm 7.0)
Venda 19 (0.6 µm)
Clear
Toner GOES-10
Compare
Chascar encendido los acoplamientos abajo para ver un producto
Venda 1 (0.65 µm)
Venda 2 (µm 3.9)
Venda 3 (µm 6.7)
Venda 4 (µm 10.7)
Venda 5 (µm 12.0)
GOES-10 Sounder - todas las vendas
Chascar encendido los acoplamientos abajo para ver un producto
sector 14N
sector 01S
sector 15S
sector 33S
GOES-10 Sounder - sectores combinados
Chascar encendido los acoplamientos abajo para ver un producto
Venda 8 (µm 11.0)
Clear
Imágenes derivadas del producto
tapa de la página
Productos de la nube GOES-10
Compare
Chascar encendido los acoplamientos abajo para ver un producto
Nublarte la presión superior
Nublarte la presión superior - sectores combinados
Clear
Productos de la recuperación GOES-10
Compare
Chascar encendido los acoplamientos abajo para ver un producto
Sumar el agua Precipitable
Sumar el agua Precipitable - sectores combinados
Clear
Acoplamientos relacionados:
Find: goes-10
Next
Previous
Highlight all
Match case
Done

Sondagens - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://pindara.cptec.inpe.br:8080/sondagens/index1.html#

goes-10 ssec 1-min

El tiempo real de CIMSS VA las im... | SSEC | Satélites Meteorológicos | Sondagens

Ministério da Ciência e Tecnologia

Sondagens

Divisão de Satélites e Sistemas Ambientais

Cptec Tempo Clima Previsão Numéricas Satélite Ondas Energia Dados Observacionais Pesq & Desenvolvimento

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- GOES 10
- NOAA 18 - ATOVS
- AQUA - AIRS - IMAPP
- AQUA - AIRS - NASA
- AQUA - MODIS - IMAPP
- ACERVO

Outros Links

- Onde estão os SATÉLITES?
- P&D da DSA
- Glossário

Sondagem

- Informações Técnicas
- Grupos de Pesquisa
- Home Page ITWG
- Saiba mais sobre os PERFIS
- Sensores dos satélites

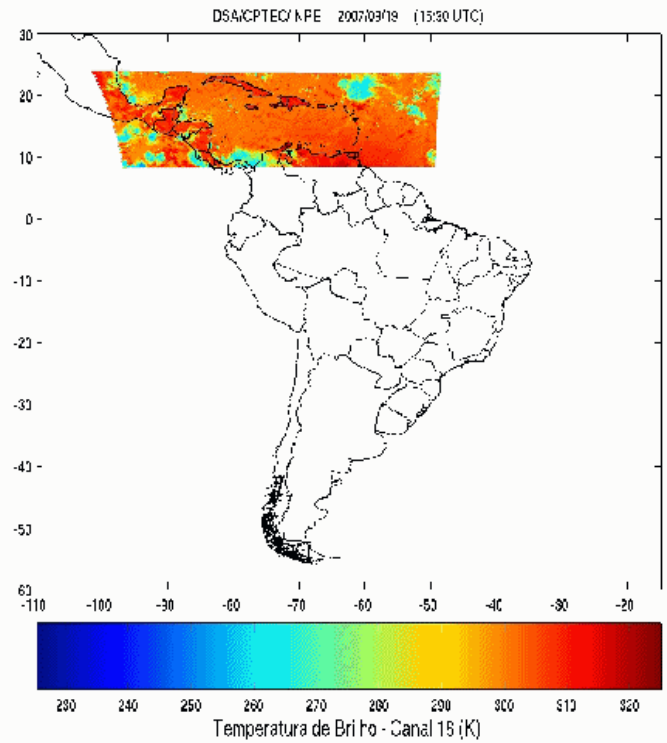
Projeto de Pesquisa

- Validação Gases Minoritários

SIGMA

SONDAGENS

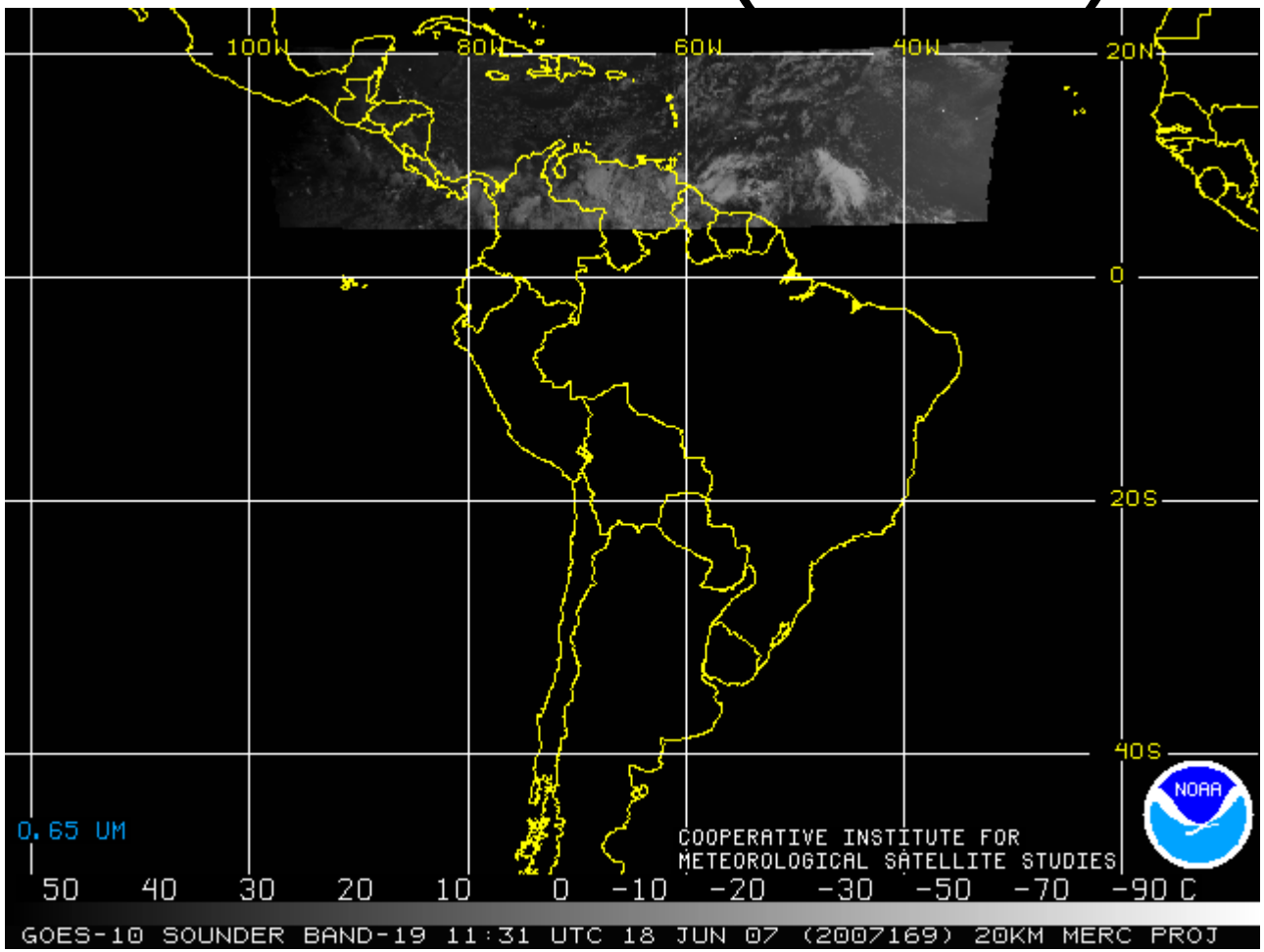
Imagem | Ampliada



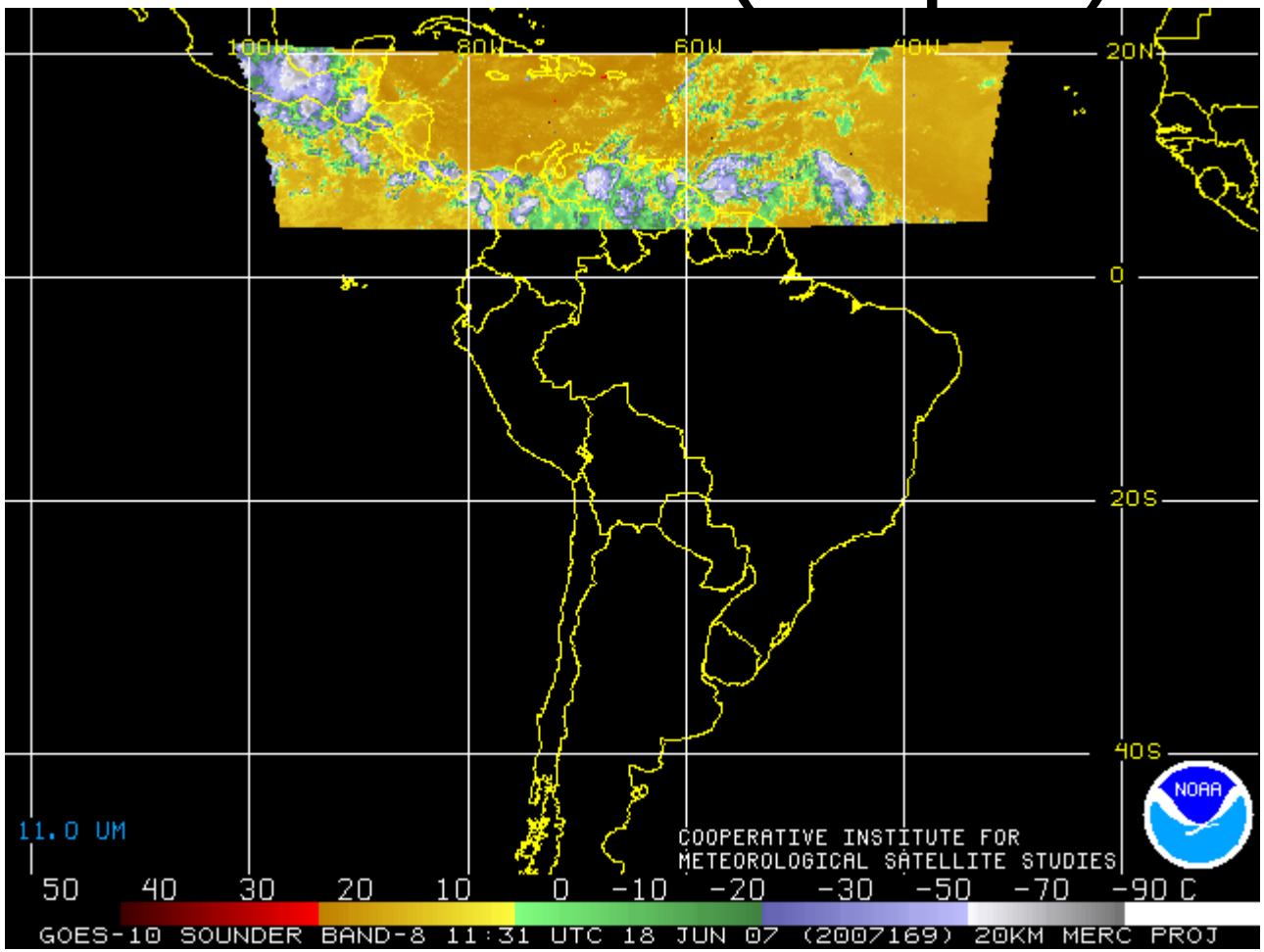
Find: goes-1 Next Previous Highlight all Match case

Done

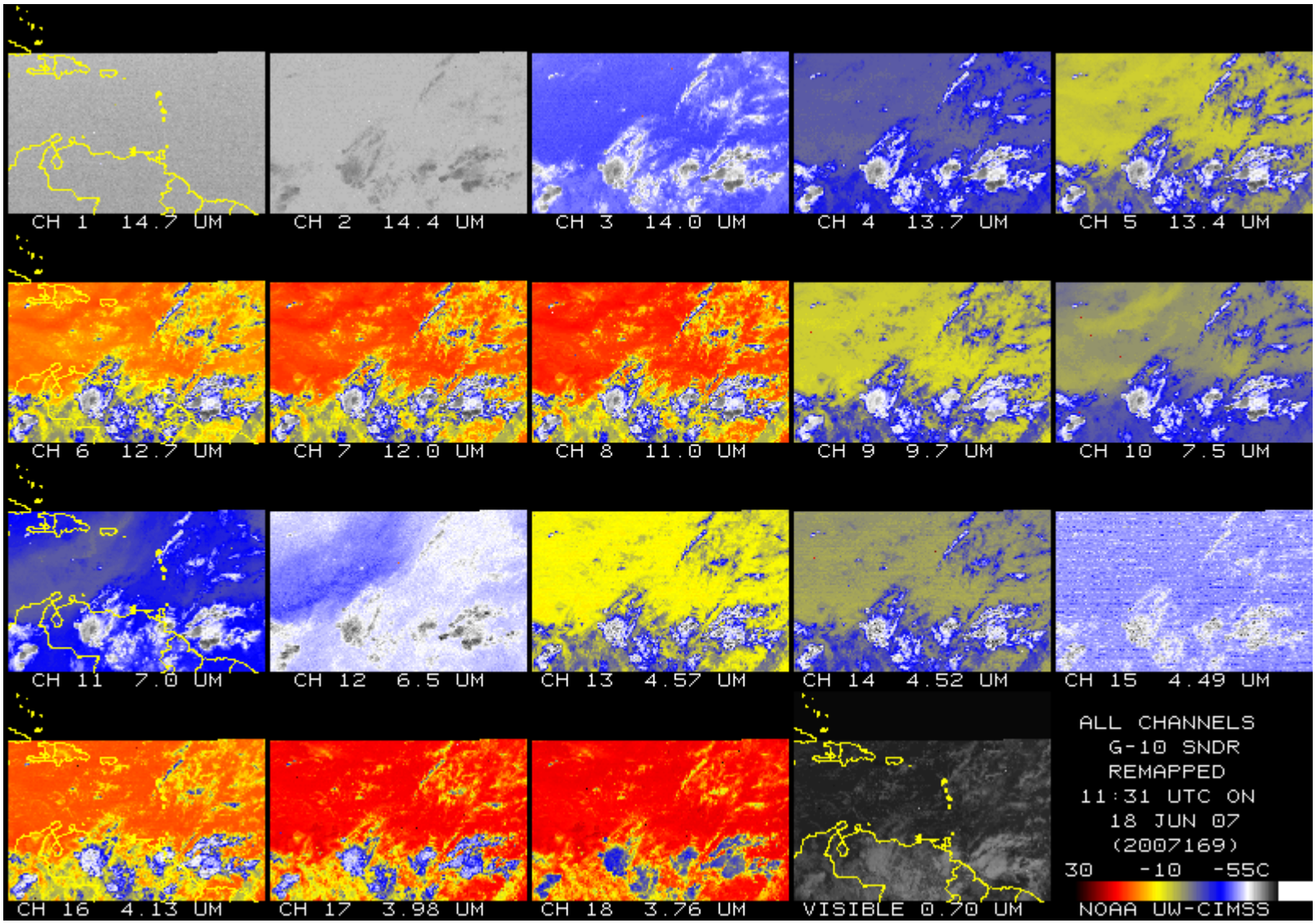
Radiances (visible)



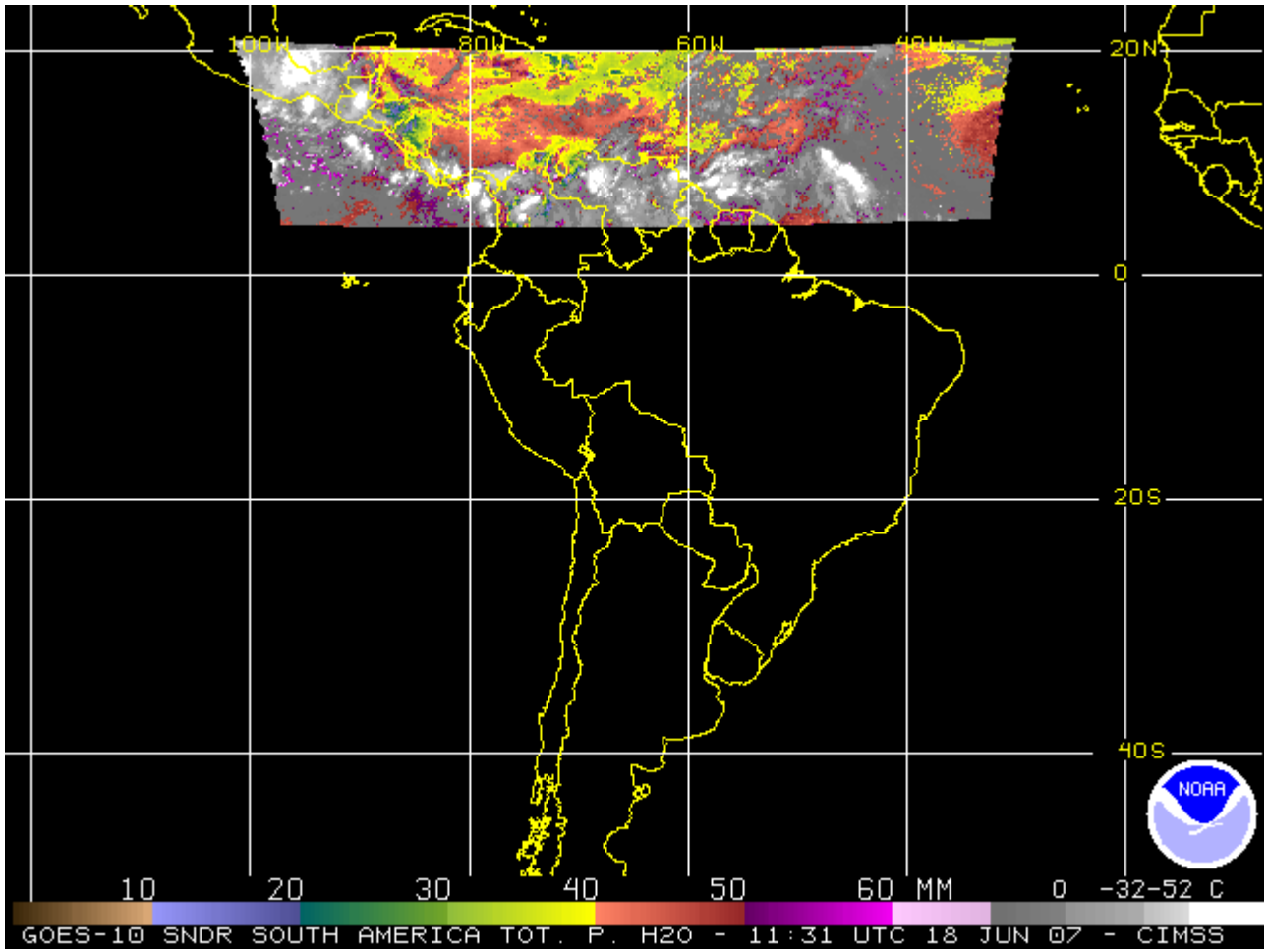
Radiances (11 μm)



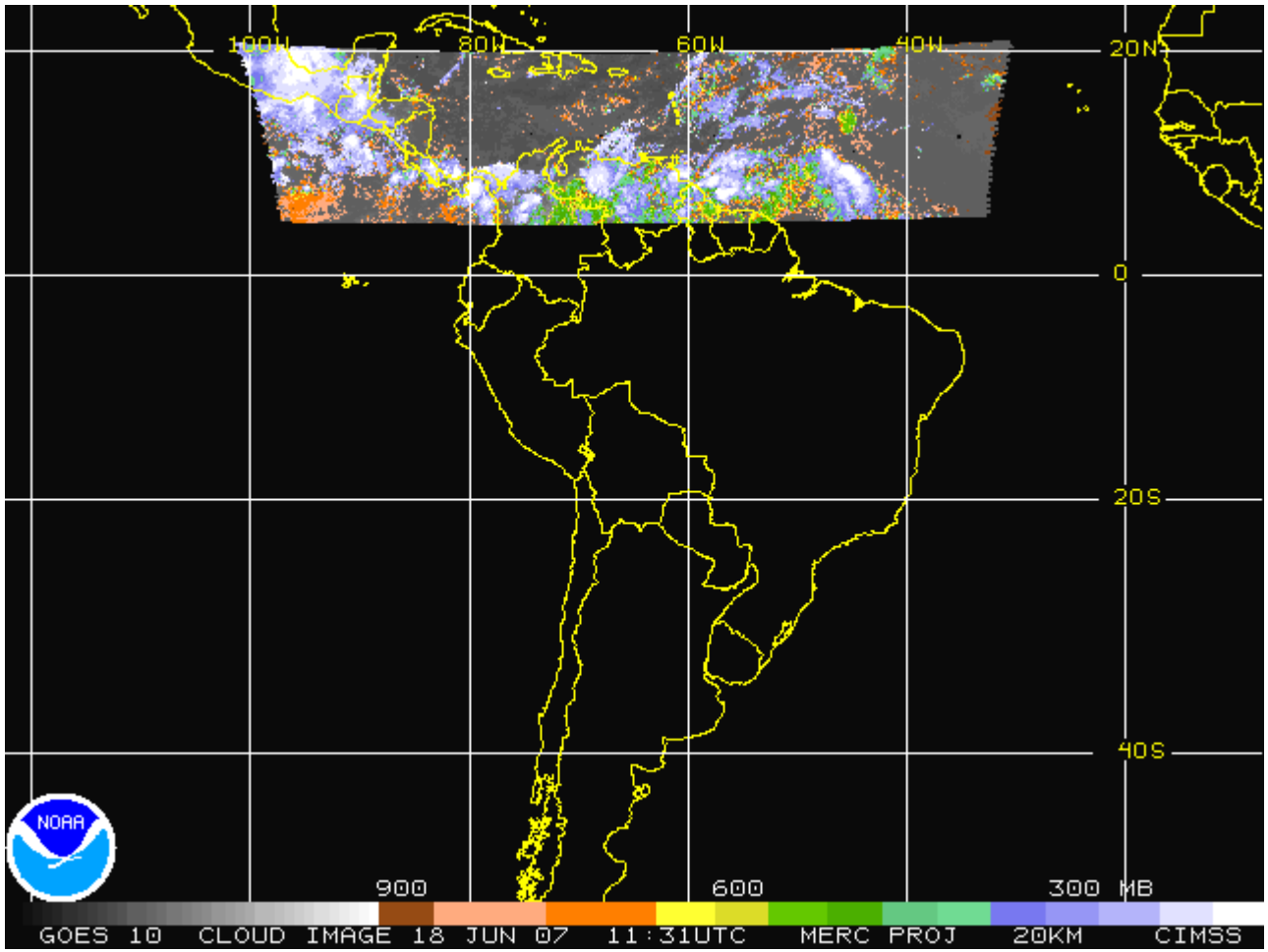
Radiances


CH 1 14.7 UM
CH 2 14.4 UM
CH 3 14.0 UM
CH 4 13.7 UM
CH 5 13.4 UM
CH 6 12.7 UM
CH 7 12.0 UM
CH 8 11.0 UM
CH 9 9.7 UM
CH 10 7.5 UM
CH 11 7.0 UM
CH 12 6.5 UM
CH 13 4.57 UM
CH 14 4.52 UM
CH 15 4.49 UM
CH 16 4.13 UM
CH 17 3.98 UM
CH 18 3.76 UM
VISIBLE 0.70 UM
ALL CHANNELS
G-10 SNDR
REMAPPED
11:31 UTC ON
18 JUN 07
(2007169)
30 -10 -55C
NOAA UW-CIMSS

TPW


100W
80W
60W
40W
20N
0
20S
40S
NOAA
10
20
30
40
50
60 MM
0
-32-52 C
GOES-10 SNDR SOUTH AMERICA TOT. P. H2O - 11:31 UTC 18 JUN 07 - CIMSS

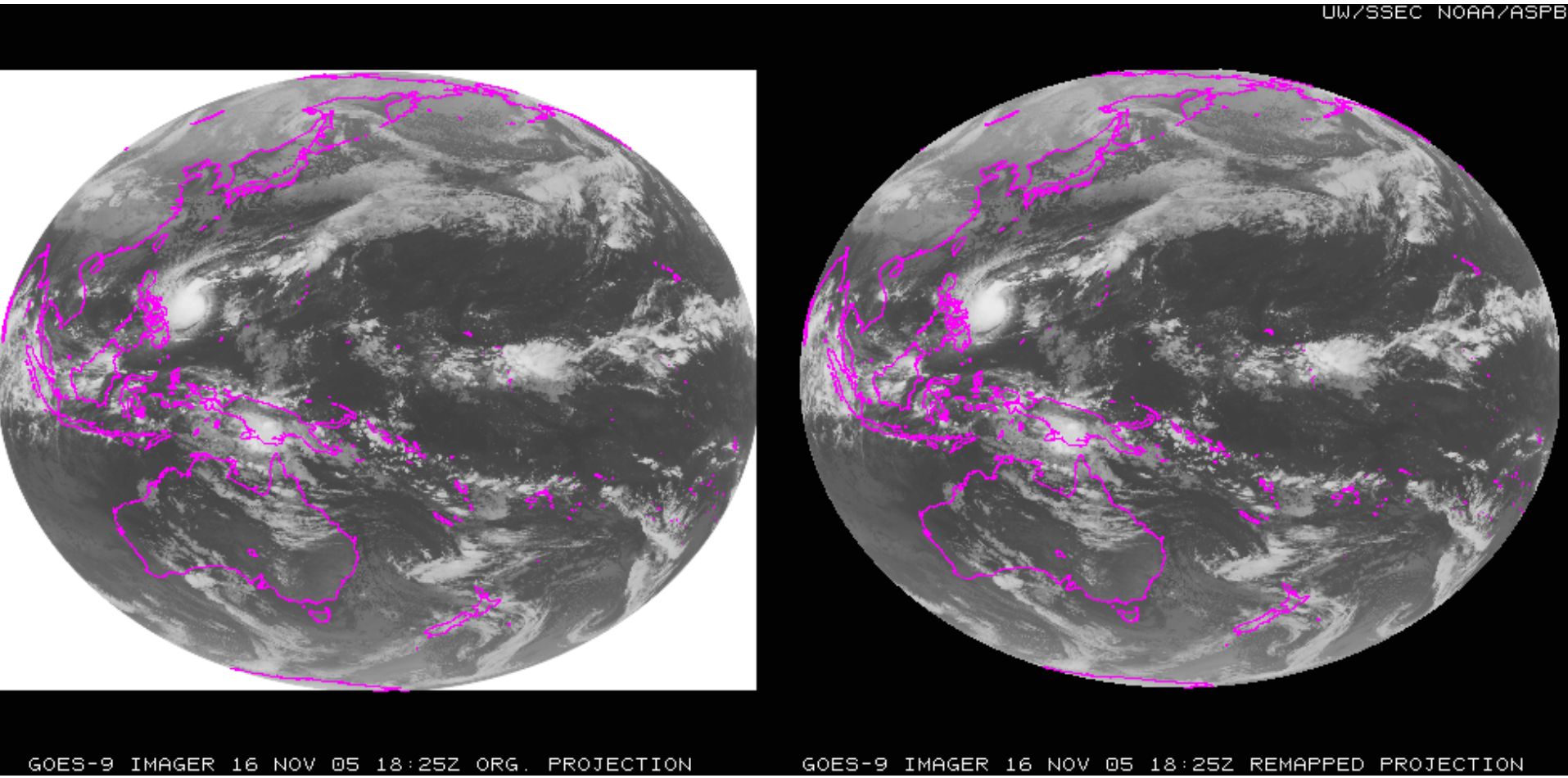
Clouds


100W
80W
60W
40W
20N
0
20S
40S
NOAA
900
600
300 MB
GOES 10 CLOUD IMAGE 18 JUN 07 11:31UTC MERC PROJ 20KM CIMSS

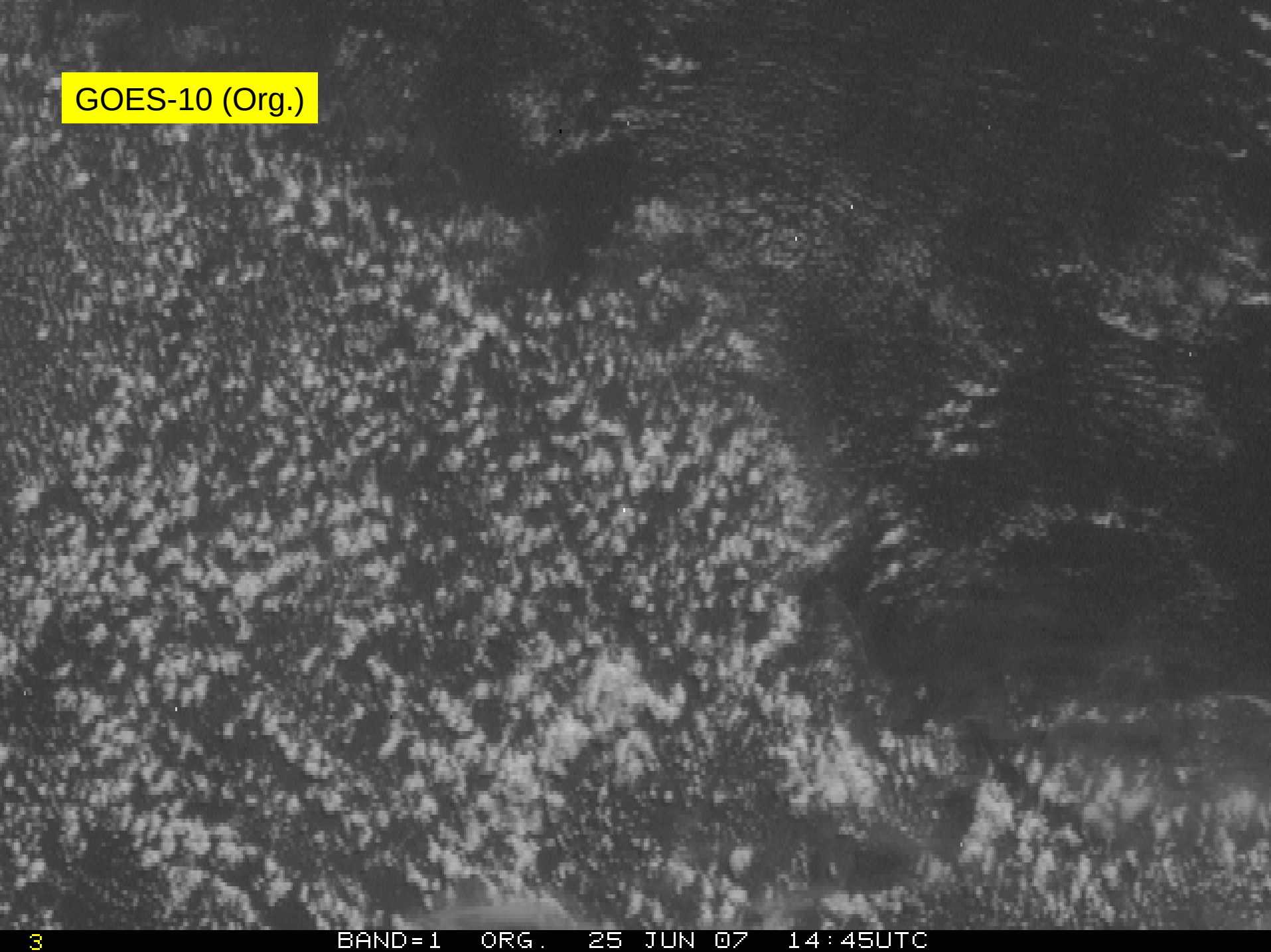
XGOHI

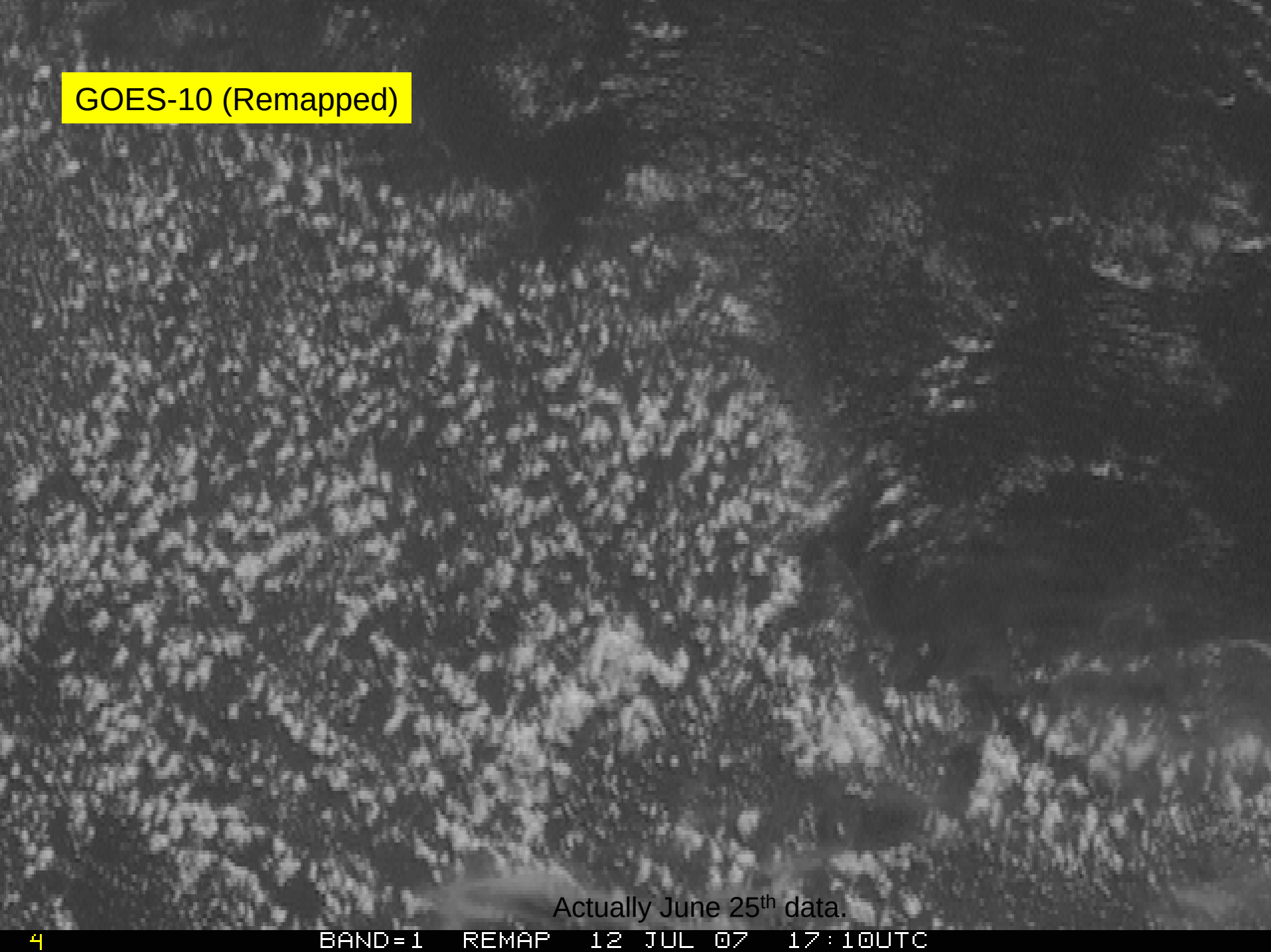
- XGOHI = eXtended GOes High Inclination operations (only Imager)
- Due to a large satellite inclination, a remap (before) GVAR distribution for GOES-10 Imager data are being considered. [IMC “saturates” at 2 degree inclination.]
- Remapped GOES-10 GVAR data from 25-June-2007 and via the satellite re-broadcast (12-July-2007, 23-July-2007) were investigated.
- Without XGOHI, the growing satellite inclination would continue to cause loops with an ever increasing ‘wobble’.
- There’s no meteorological reason the NOAA/NESDIS should not remap the GOES-10 Imager data.
- Care must be taken to monitor the fire products.
- Given the current remapping parameters, the pro’s of XGOHI (steady image loops) outweigh the con’s (slightly changed hot spot detection).
- GOES-10 Imager XGOHI operations started at 19:13UTC on October 2, 2007

GOES-9 High Inclination Movie

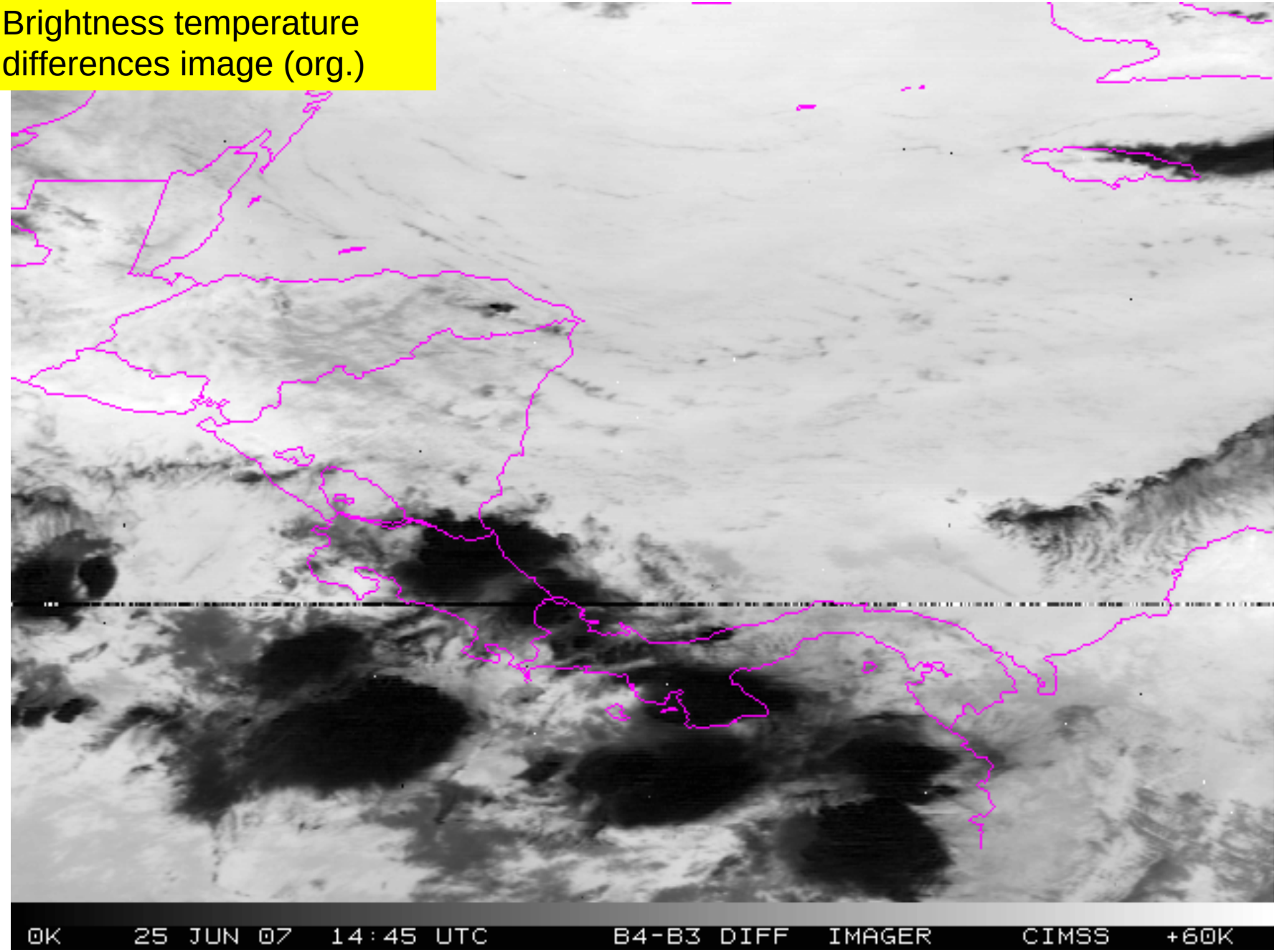


Inclination of approximately 1.8 degrees

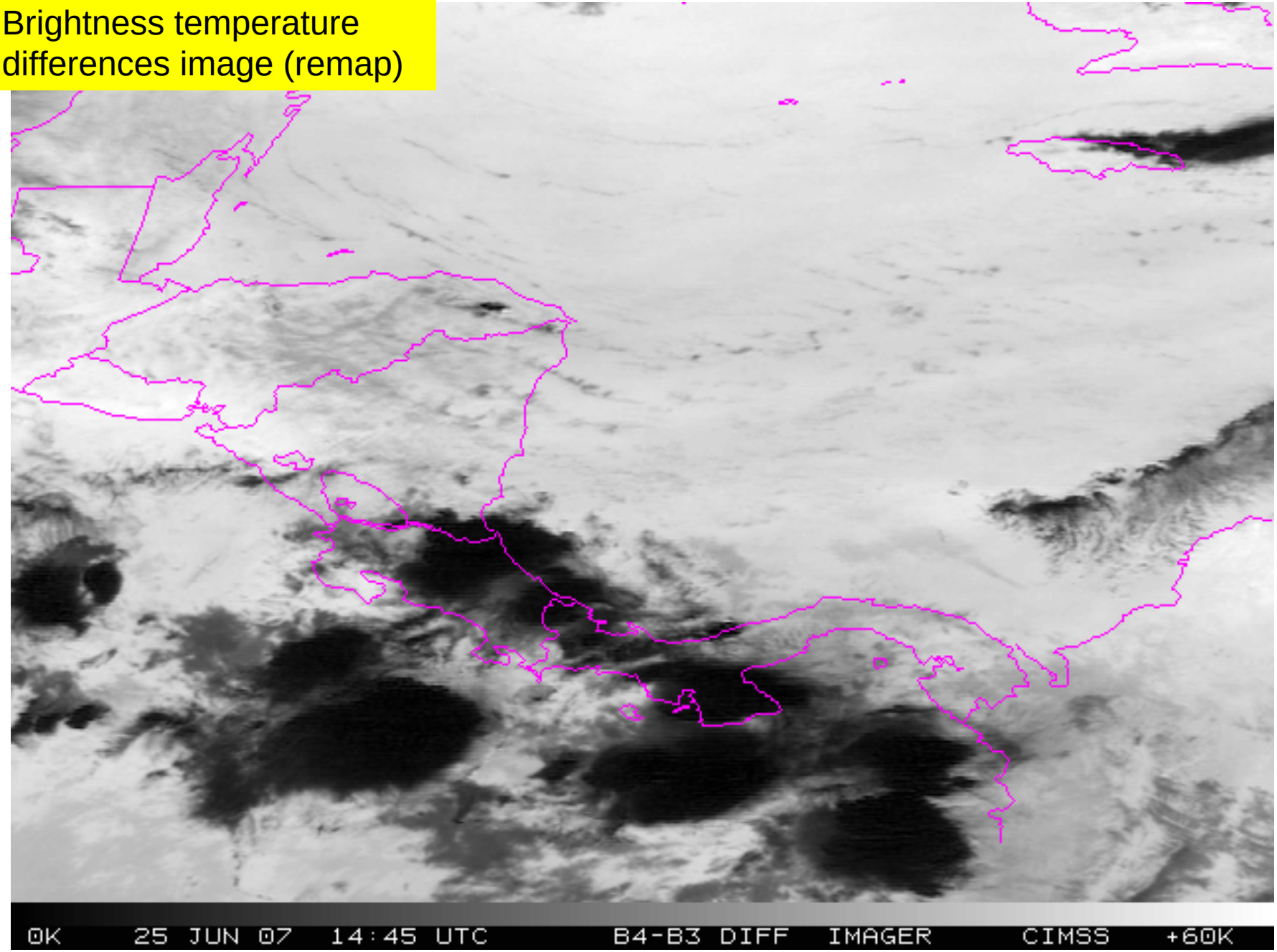

GOES-10 (Org.)
3
BAND=1 ORG. 25 JUN 07 14:45UTC


GOES-10 (Remapped)
Actually June 25th data.
4 BAND=1 REMAP 12 JUL 07 17:10UTC

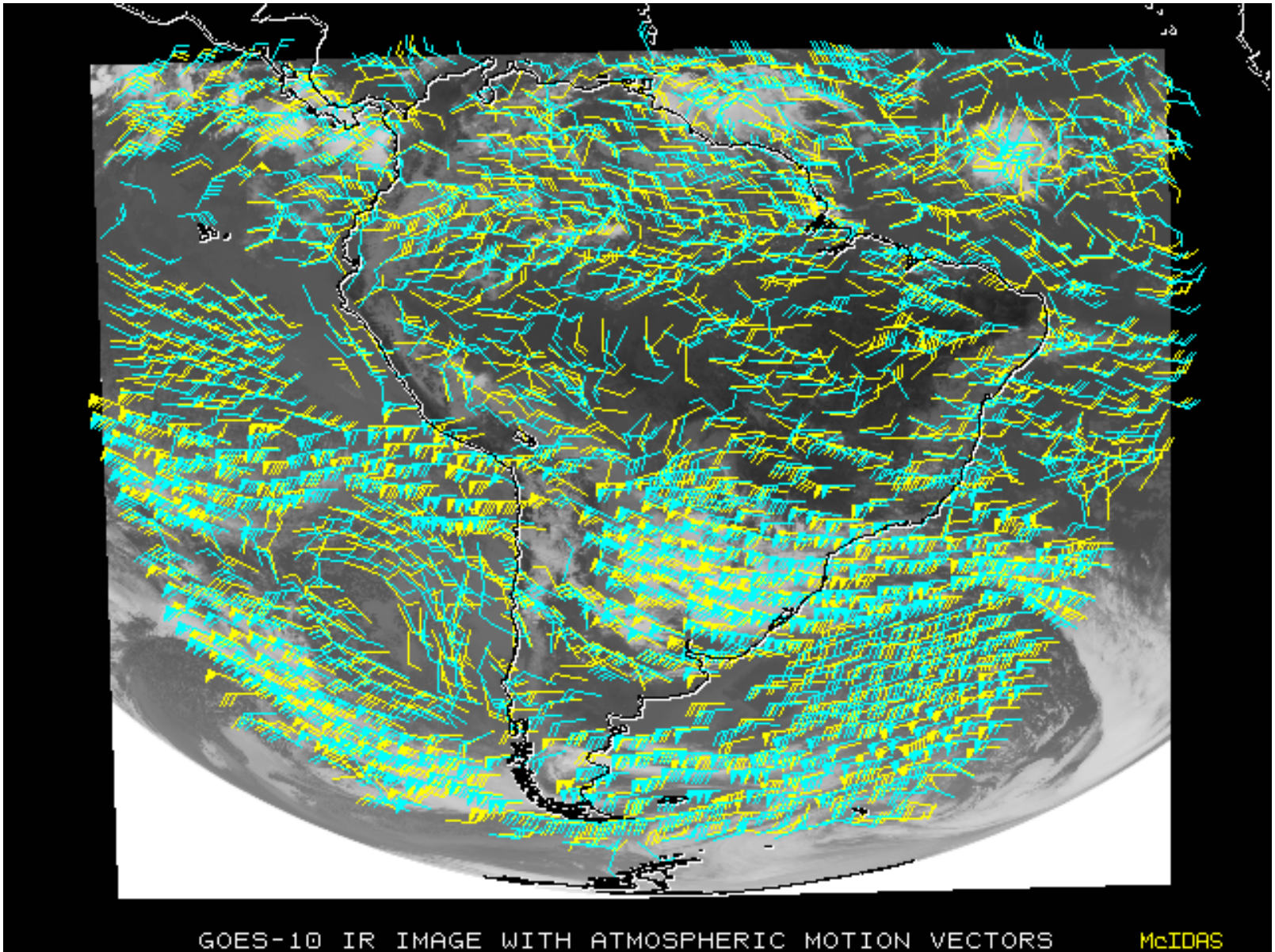
Brightness temperature differences image (org.)



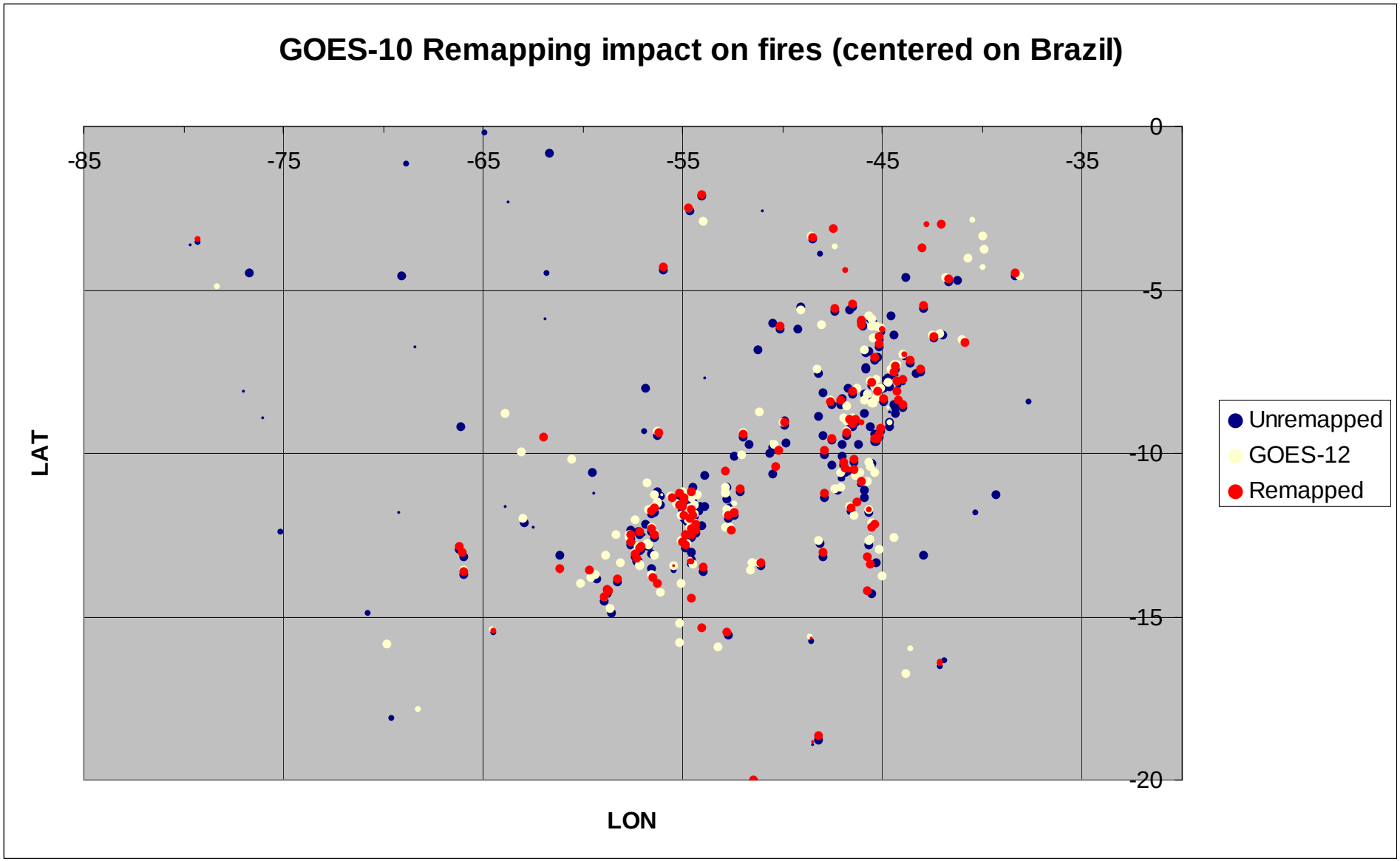
Brightness temperature differences image (remap)



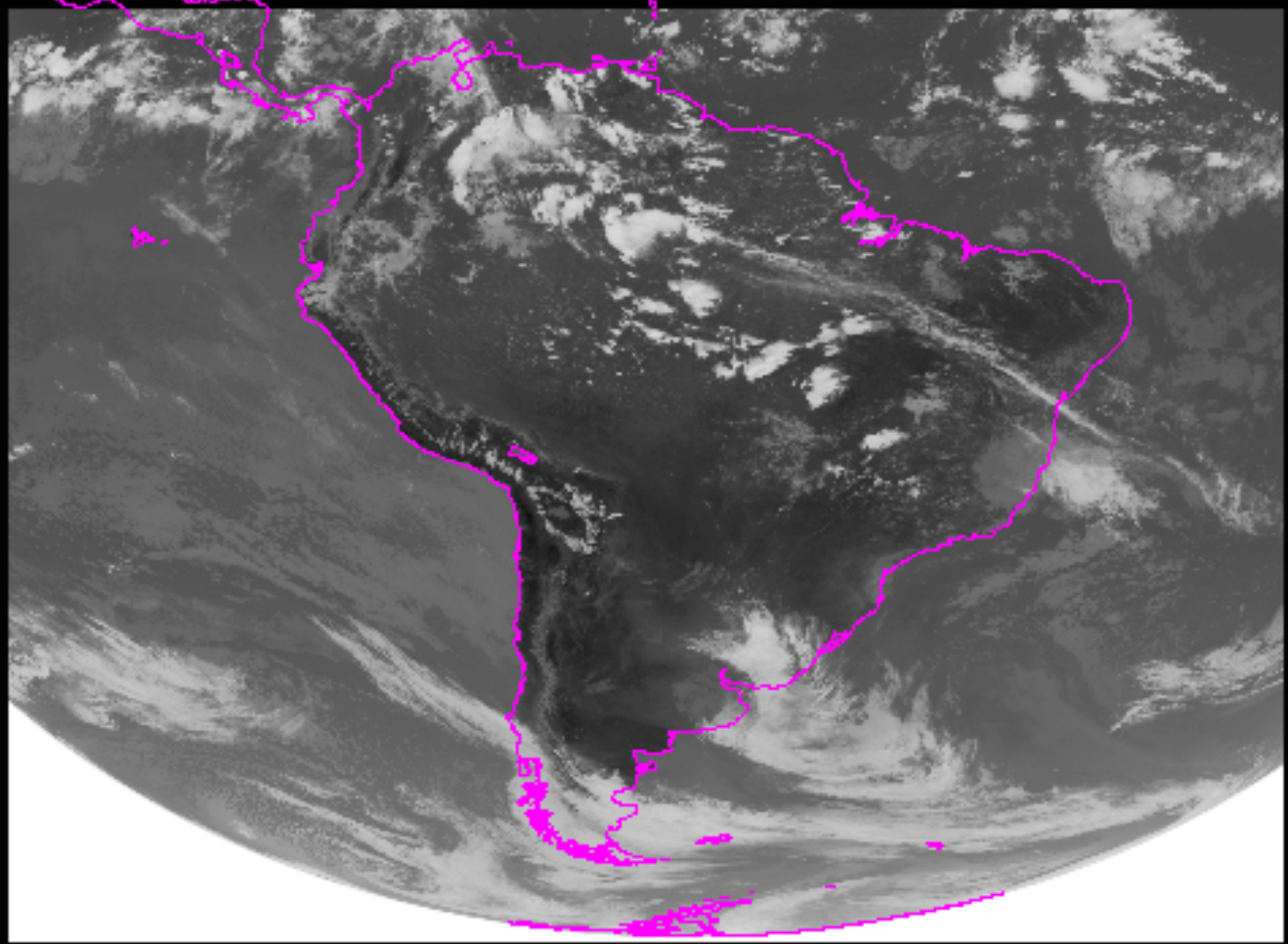
AMV (both sets, thinned)



GOES-10 Unremapped vs GOES-10 Remapped vs GOES-12

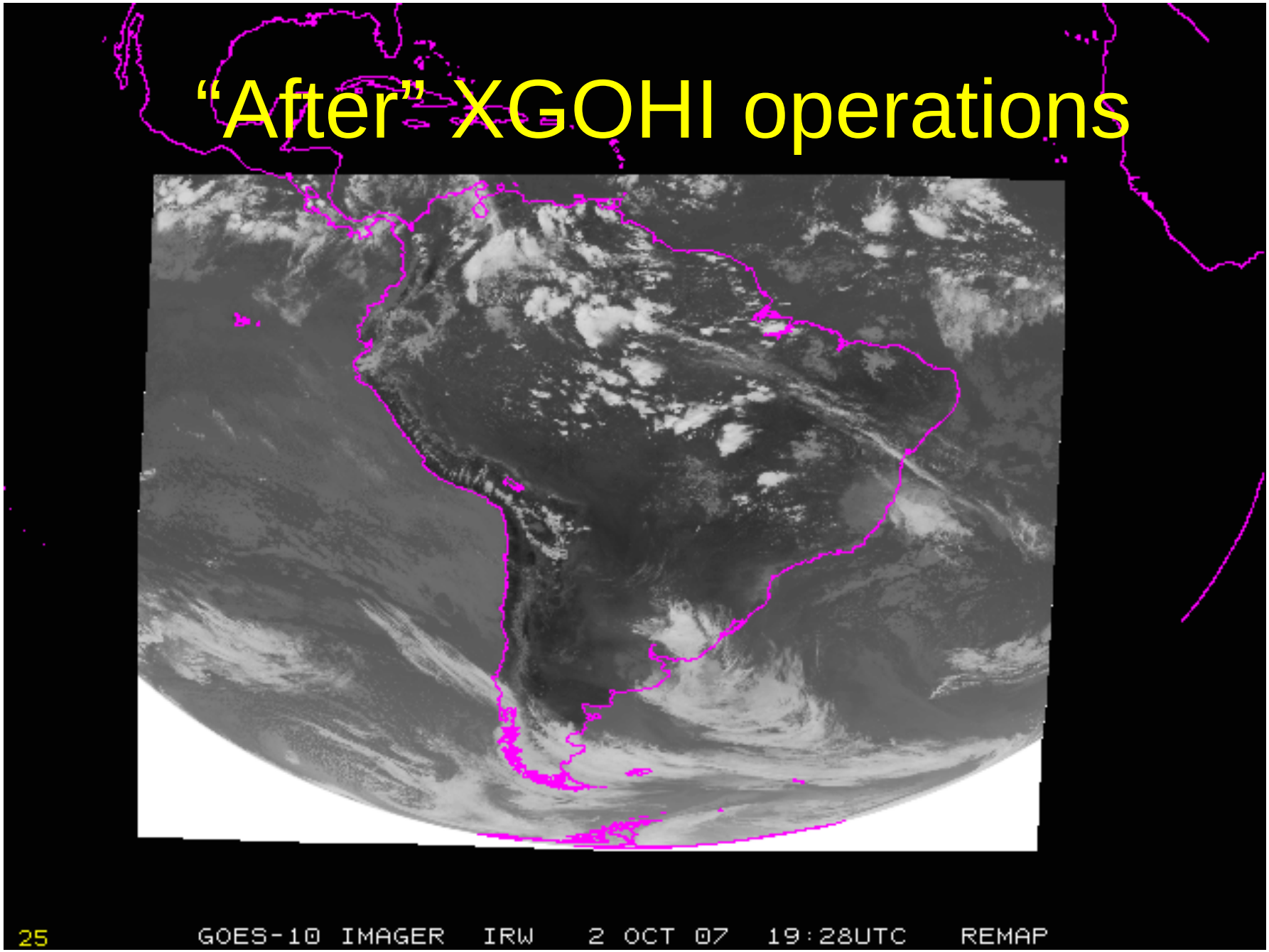


“Before” XGOHI operations



24 GOES-10 IMAGER IRW 2 OCT 07 18:45UTC ORG.

“After” XGOHI operations



Outline

- GOES-10
  - SH support
  - XGOHI
- **GOES-13**
- GOES-O/P
  - 13.3 μm change
- GOES-R
  - Schedule
  - ABI
  - Intro GLM

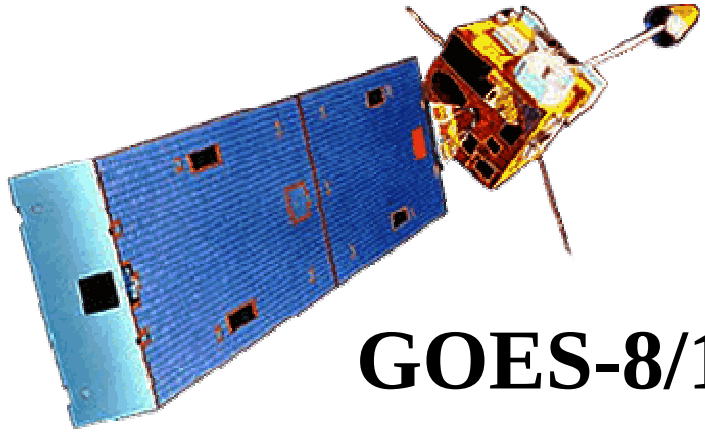
GOES-13

GOES-13/O/P will have similar instruments to GOES-8-12, but on a different spacecraft bus.

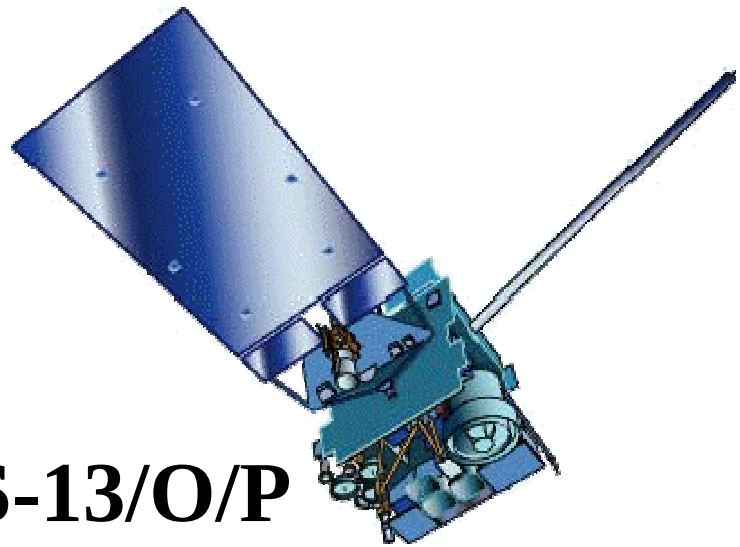
Spring and fall eclipse outages will be avoided by larger onboard batteries.

Improved navigation

Improved radiometrics

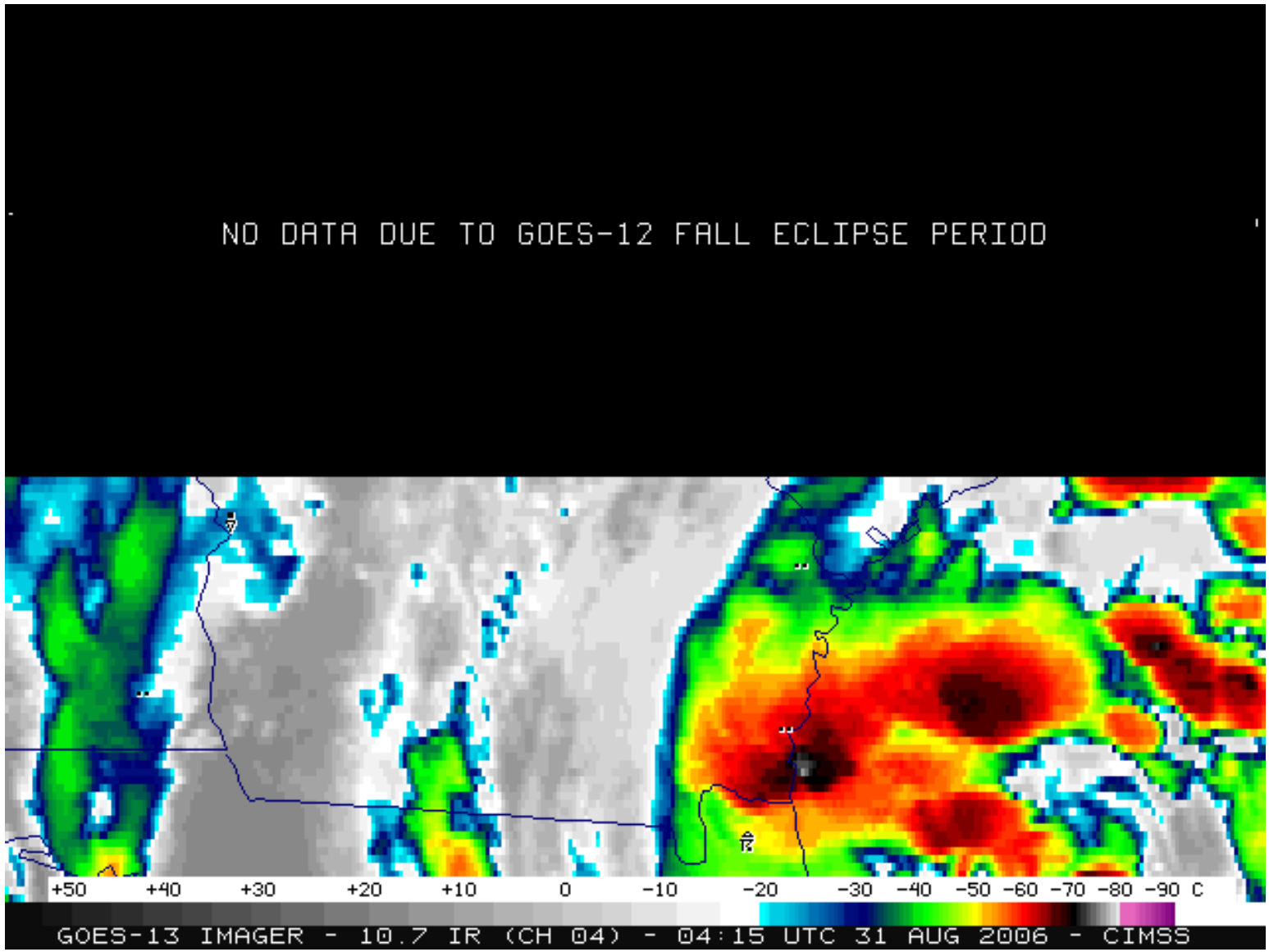


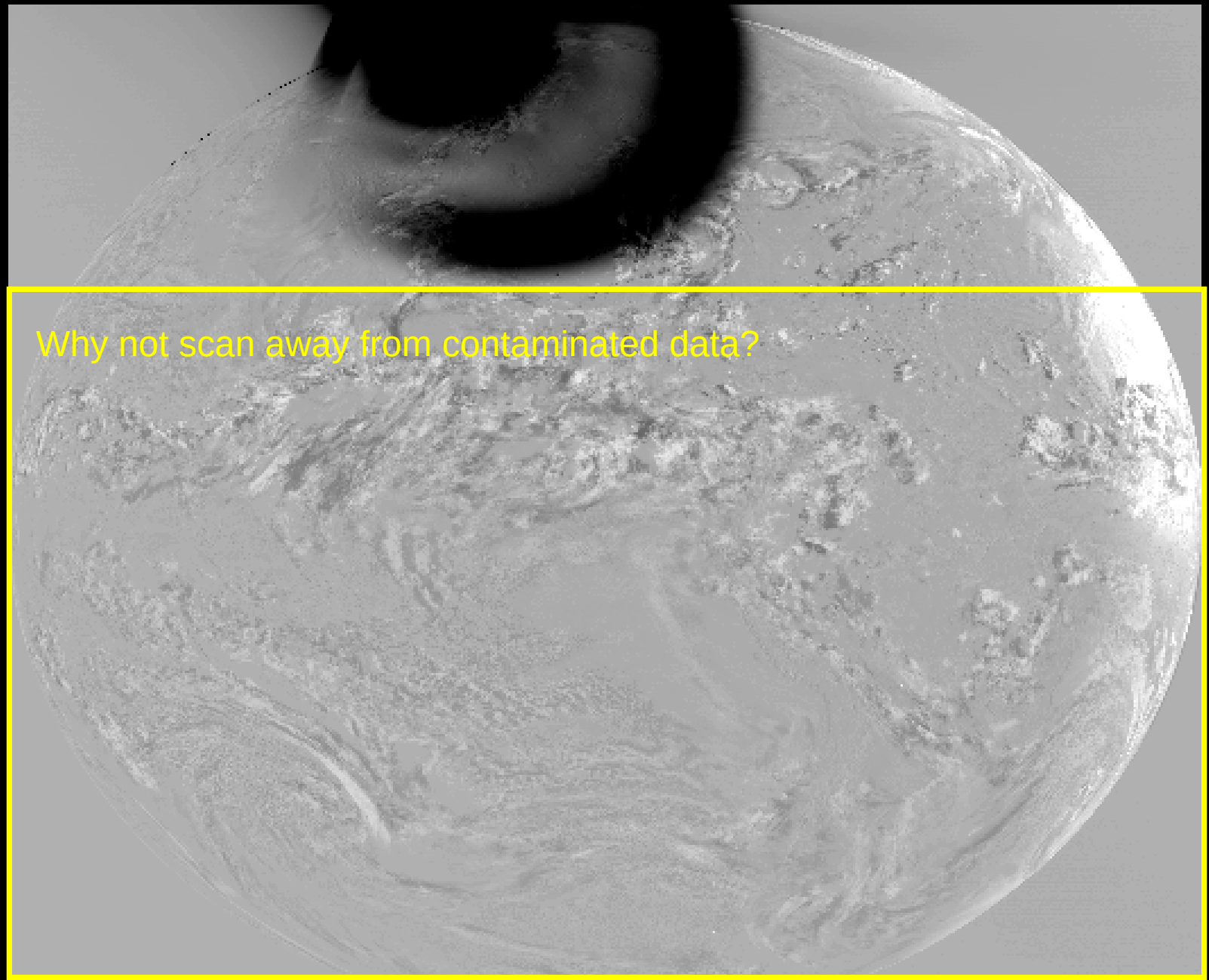
GOES-8/12



GOES-13/O/P

GOES-12/13 (During eclipse)

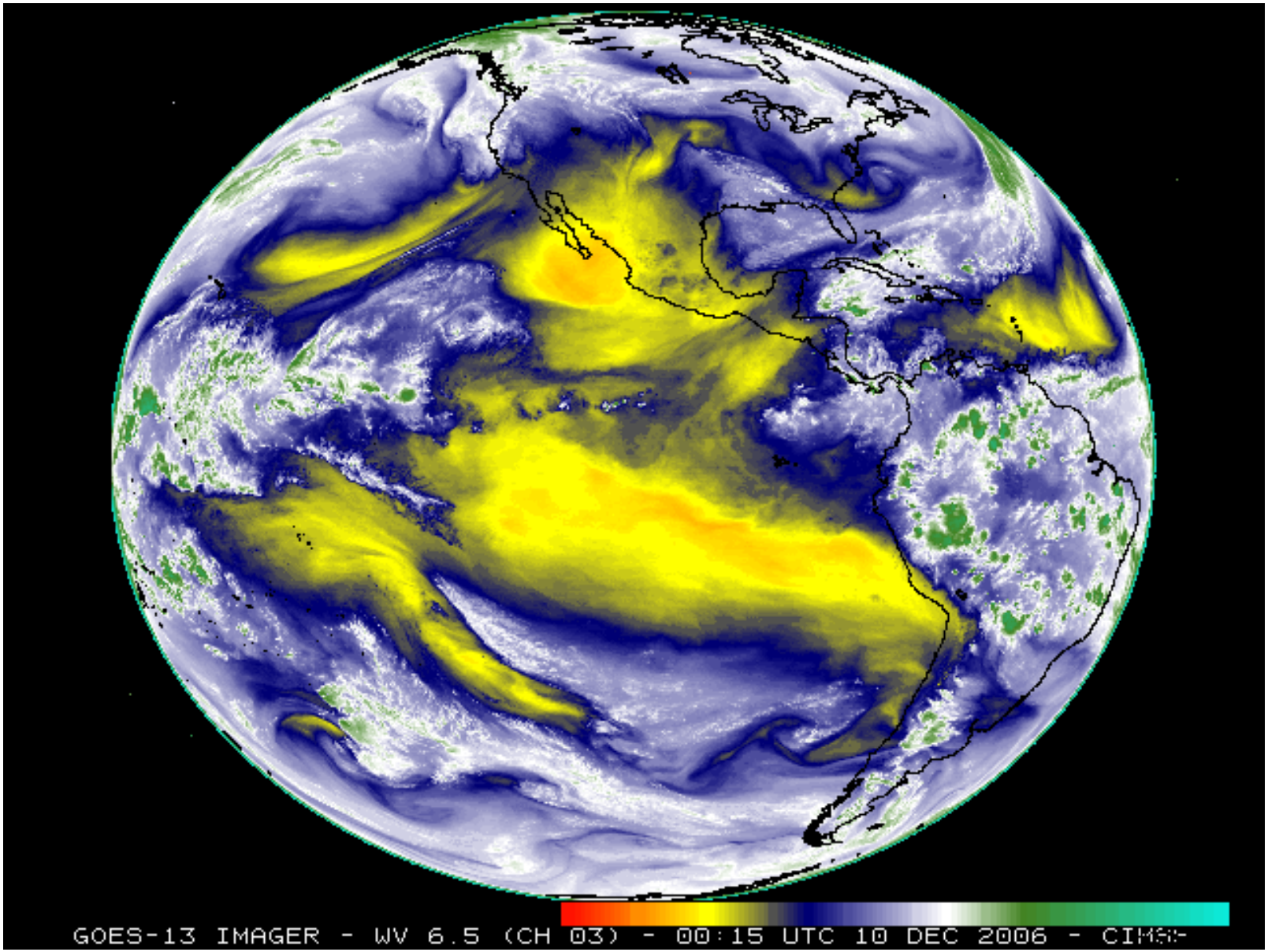




-500COUNTS +500COUNTS

GOES-13 TIME DIFFERENCE SWW 31 AUG 06 UW/ASPB

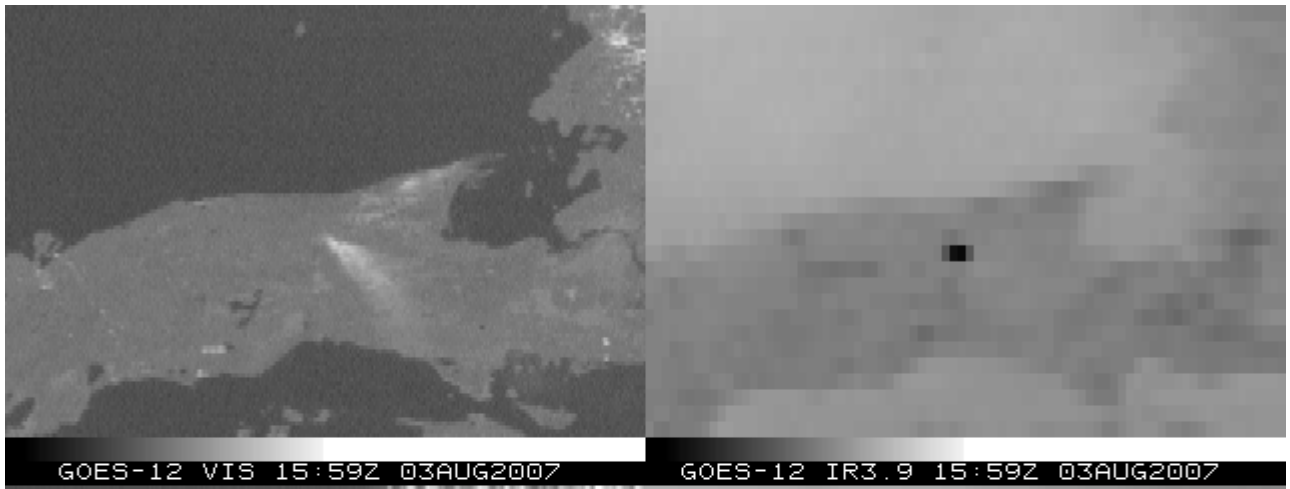
GOES-13 (Full Disk)



MI Fires

Visible Shortwave Window

GOES-12:



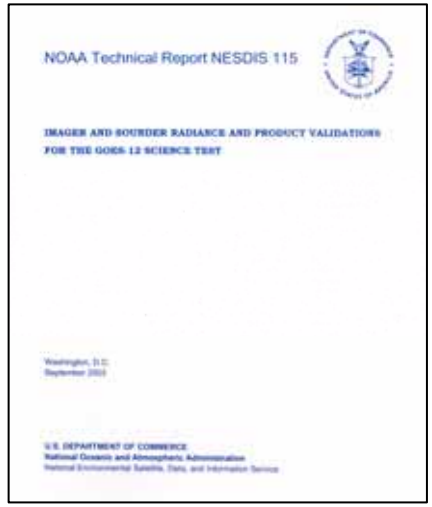
GOES-13:

3-Aug-2007

S. Bachmeier, CIMSS

NOAA Tech Memos

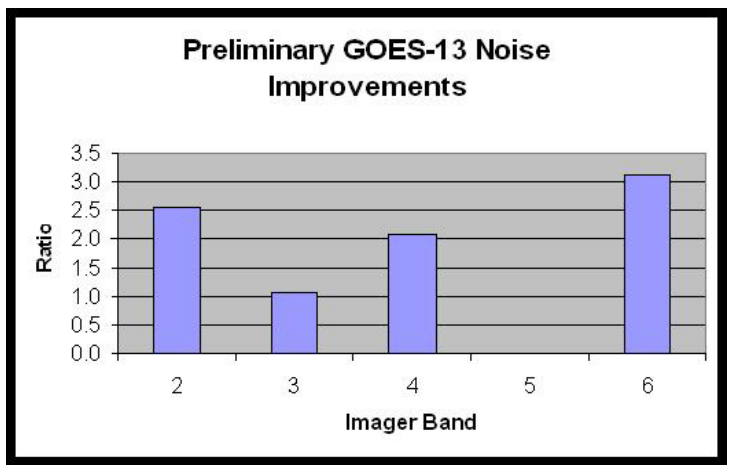
- GOES-11 (#103)
- GOES-12 (#115)
  - *http://rammb.cira.colostate.edu/research/calibration/goes_12_science_test_report.asp*
- GOES-13 (#125)

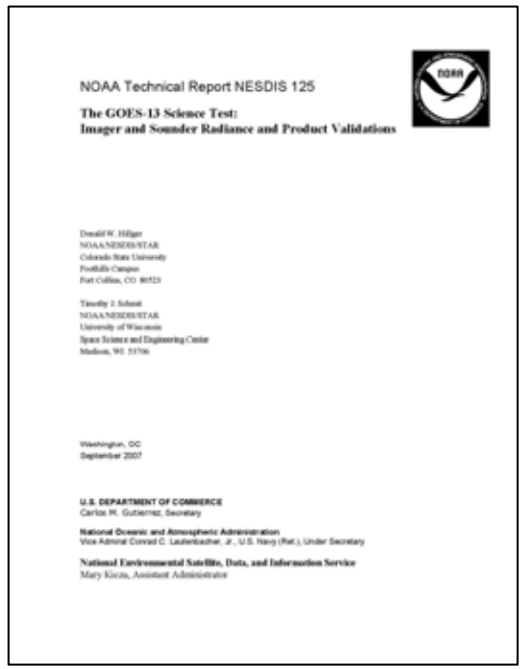

NOAA Technical Report NESDIS 115

IMAGER AND SOUNDER RADIANCE AND PRODUCT VALIDATIONS FOR THE GOES-12 SCIENCE TEST

Washington, D.C.
September 2003

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Environmental Satellite, Data, and Information Service




NOAA Technical Report NESDIS 125

The GOES-13 Science Test:
Imager and Sounder Radiance and Product Validations

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Washington, DC
September 2007

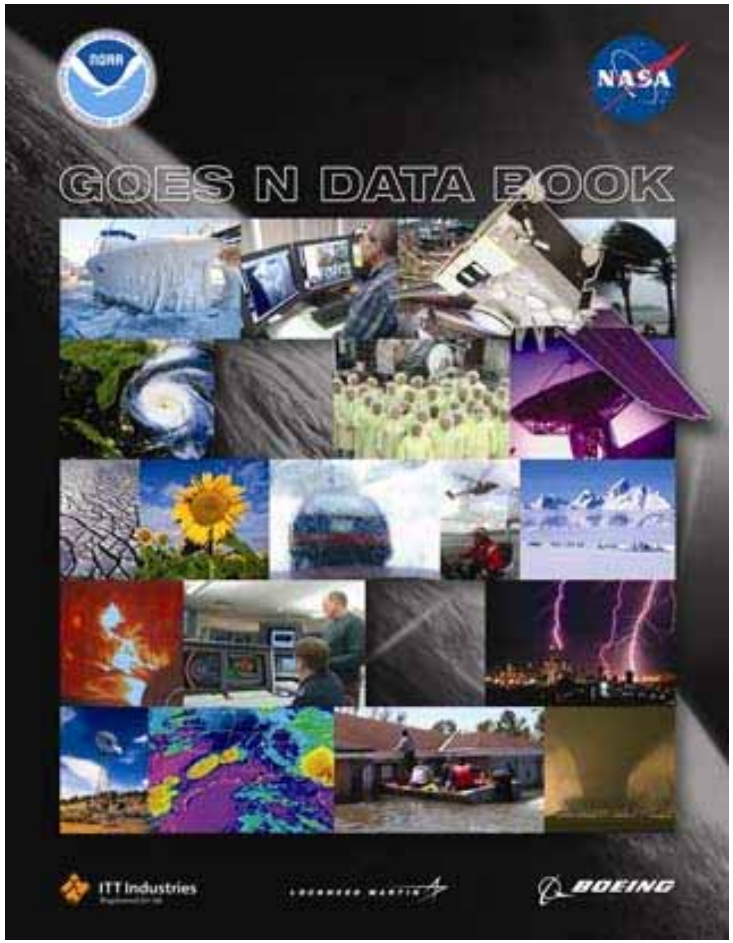
U.S. DEPARTMENT OF COMMERCE
Carlos M. Gutierrez, Secretary

National Oceanic and Atmospheric Administration
Vice Admiral Conrad C. Lautenbacher, Jr., U.S. Navy (Ret.), Under Secretary

National Environmental Satellite, Data, and Information Service
Mary Kicza, Assistant Administrator

GOES Databooks

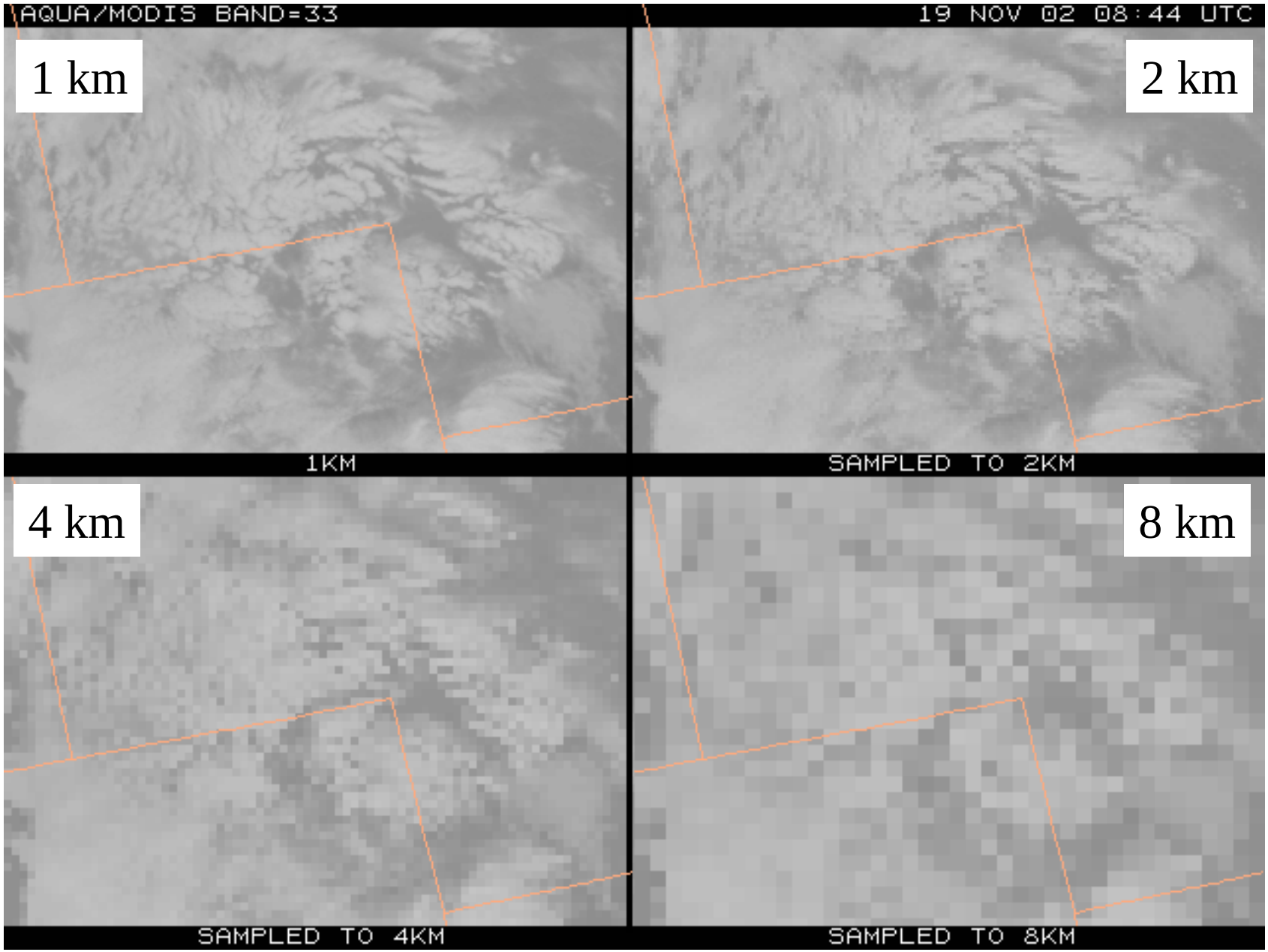
- *http://goes.gsfc.nasa.gov/text/goes.databook.html*
- *http://goes.gsfc.nasa.gov/text/goes.databookn.html*



Outline

- GOES-10
  - SH support
  - XGOHI
- GOES-13
- **GOES-O/P (GVAR change)**
  - 13.3 µm with ~4km IGFOV
- GOES-R
  - Schedule
  - ABI
  - Intro GLM

GOES-O – improved spatial resolution of the 13.3 µm band.



GOES-0

- To better prepare for the GVAR changes, plans call for sample GOES-O GVAR data (from thermal vacuum testing) to be posted.
- Sample GVAR date availability is TDB
- Launch date *may* be June of 2008

GOES Launch - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://www.osd.noaa.gov/GOES/goes-launch.htm

babelfish

ABI | GOES Launch | GOES-O STATUS | eoPortal directory: GOE... | http://ggt.c...archall.asp | http://babel...babelfish/tr

Monday, October 1st, 2007

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- Publications/Downloads
- GVAR Download
- Organization Charts
- Contacts OSD
- Related Website

GOES Planned Launch Schedule

Updated as of April 27, 2006

*** Current ***

Spacecraft	Launch Need Date	Planning Launch Date
GOES - O	April 2008	April 2008
GOES - P	October 2008	April 2009

*** Future Launch ***

Spacecraft	Launch Need Date	Planning Launch Date
GOES - O	February 2007	April 2007
GOES - P	January 2008	October 2008
GOES - R	September 2012	September 2012
GOES - S	April 2014	April 2014

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GVAR | Publications | Contact Us | Related Website

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GOES Program

- System Info.
- GOES Launch Schedule
- GOES-N Spacecraft
- GOES-N Photo
- GOES-M Status
- GOES-8 Status
- GOES-9 Status
- GOES-10 Status
- GOES-11 Status
- Daily Status
- System Status
- GVAR Download

Find: goes-o Next Previous Highlight all Match case

Done

To be launched by NASA for the Missile Defense Agency (MDA).

April 1 — STSS

STSS B06 is a midcourse tracking technology demonstrator and is part of an evolving ballistic missile defense system. STSS is capable of tracking objects after boost phase and provides trajectory information to other sensors and interceptors.
To be launched by NASA for the MDA.

April 21 * — GOES-O

NASA and the National Oceanic and Atmospheric Administration (NOAA) are actively engaged in a cooperative program, the multimission Geostationary Operational Environmental Satellite series N-P. This series will be a vital contributor to weather, solar and space operations, and science. GOES-O is a NASA/NOAA mission that will launch off a ULA Delta IV launch vehicle from Launch Complex 37.

April 24 + — STS-124

Space Shuttle Discovery on mission STS-124 will transport the Kibo Japanese Experiment Module - Pressurized Module (JEM-PM) and the Japanese Remote Manipulator System (JEM RMS) to the International Space Station.

The launch window opens 7 July 2007 at 22:30 GMT (6:30 pm EDT)

GOES-O STATUS **last update 20 March 2006**

Spacecraft

In the spring of 2004, the GOES-O spacecraft was under construction, and went through thermal-vac testing in the spring of 2005. As of mid-2005, it is in pre-launch storage at Boeing Space Systems (BSS).

As of March 2006, the GOES-O launch date is planned for 7 July 2007.

Imager

Imager SN09 was constructed and tested at ITT in Fort Wayne, Indiana in the late 1990's. It was delivered to Boeing Space Systems (BSS) and integrated onto GOES-O in 2003/4. There are no significant issues with the Imager.

Sounder

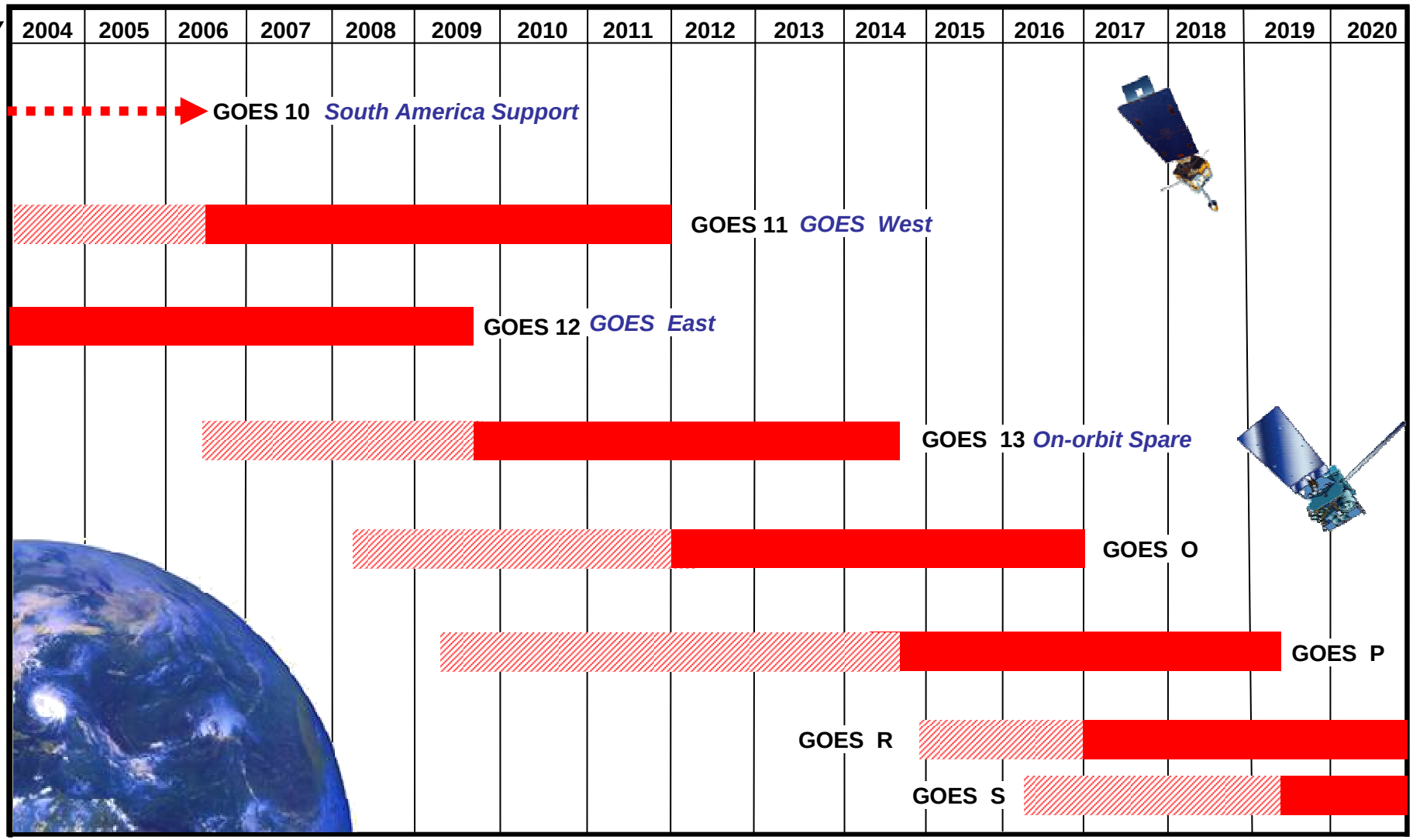
Sounder SN09 was constructed and tested at ITT in Fort Wayne, Indiana in the late 1990's. It was delivered to Boeing Space Systems (BSS) and integrated onto GOES-O in 2003/4. There are no significant issues with the Sounder.

Launch

Outline

- GOES-10
  - SH support
  - XGOHI
- GOES-13
- GOES-O/P
  - 13.3 μm change
- **GOES-R**
  - Schedule
  - ABI
  - Intro GLM

Continuity of GOES Operational Satellite Program



Critical Products to the Nation

- **Advanced Baseline Imager (ABI)**
  - Monitors and tracks severe weather, winds, hurricanes, hazards, etc.
  - Images clouds to support forecasts
  - Aerosols for Air Quality & Climate Applications
  - Volcanic ash tracking, fire and smoke detection, winds and icing detection

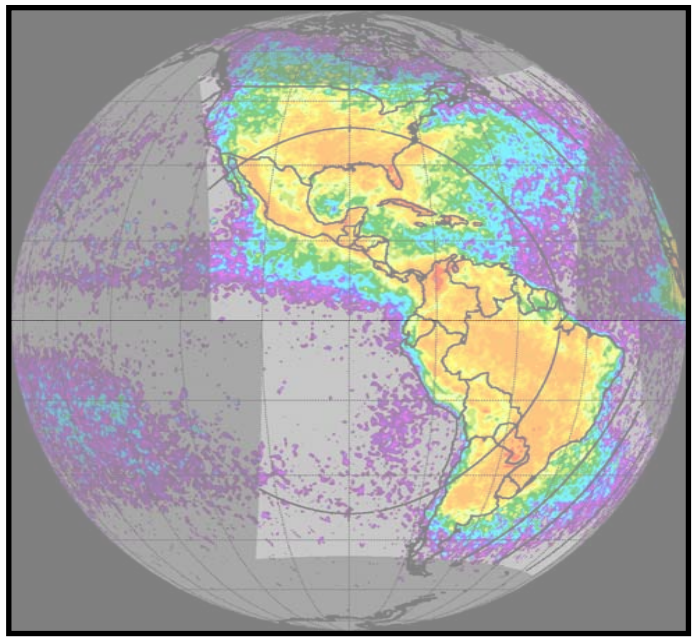
- **Hyperspectral Environmental Suite (HES)**
  - Provides atmospheric moisture and temperature profiles to support environmental models, forecasts and climate monitoring
  - Monitors coastal regions for ecosystem health, water quality, coastal erosion, harmful algal blooms, sea surface temperature
  - Geostationary sampling of ocean color allows coastal resource management

- **Geostationary Lightning Mapper (GLM)**
  - Detects lightning strikes as an indicator of severe storms
  - Previous capability only existed on polar satellites

- **EXIS – (EUV and X-Ray Irradiance Sensors) and Space Environmental In-Situ Suite (SEISS)**
  - Images the sun and measures solar output to monitor solar storms (SUVI/EXIS)
  - Measures magnetic fields and charged particles (SEISS)
  - Enables early warnings for satellite and power grid operations, telecom services, astronauts, and airlines

- **Auxiliary Services**
  - Environmental Data Relay
  - Search and Rescue

Geostationary Lightning Mapper (GLM)



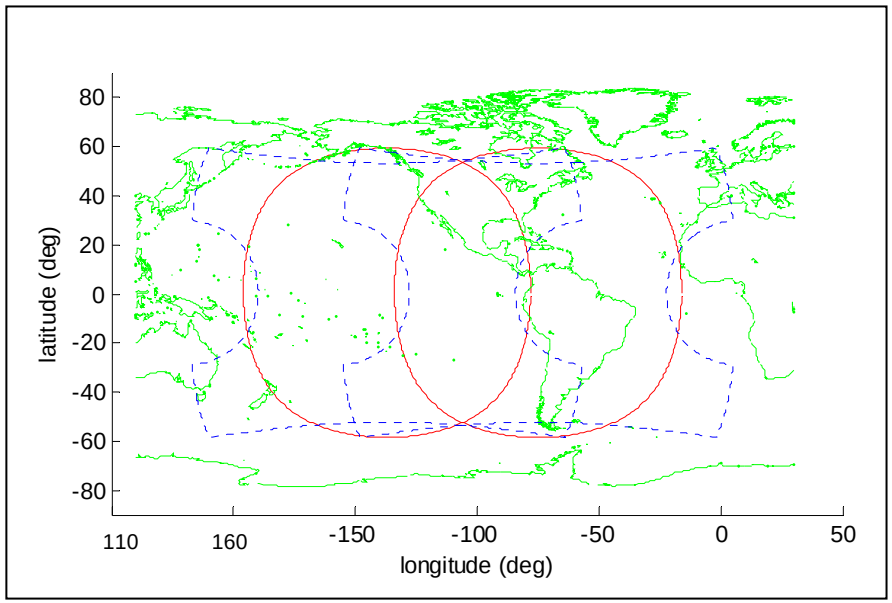
- **Detects total strikes: in cloud, cloud to cloud, and cloud to ground**
  - **Complements today's land based systems that only measure cloud to ground (about 15% of the total lightning)**
- **Increased coverage over oceans and land**
  - **Currently no ocean coverage, <u>and</u> limited land coverage in dead zones**

GLM Objectives:

Provide continuous, full-disk lightning measurements for storm warning and nowcasting.

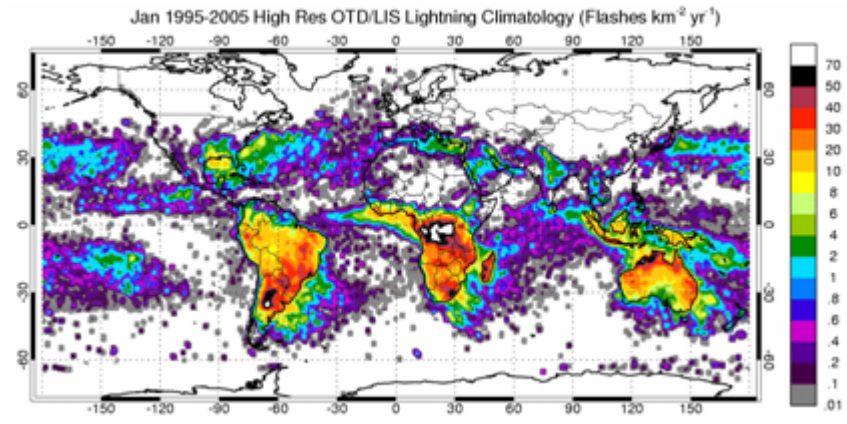
Provide early warning of tornadic activity.

GOES-E and GOES-W GLM View of CONUS and Adjacent Oceans

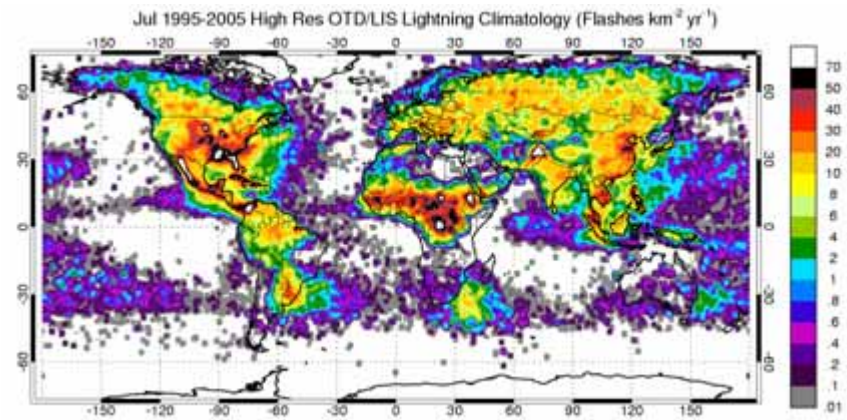


The GLM full-disk is defined as the intersection of circular and square Earth-centered fields-of-view having minimum diameter 16.0^{o} and minimum length 15.1^{o} respectively.

First geostationary LM!



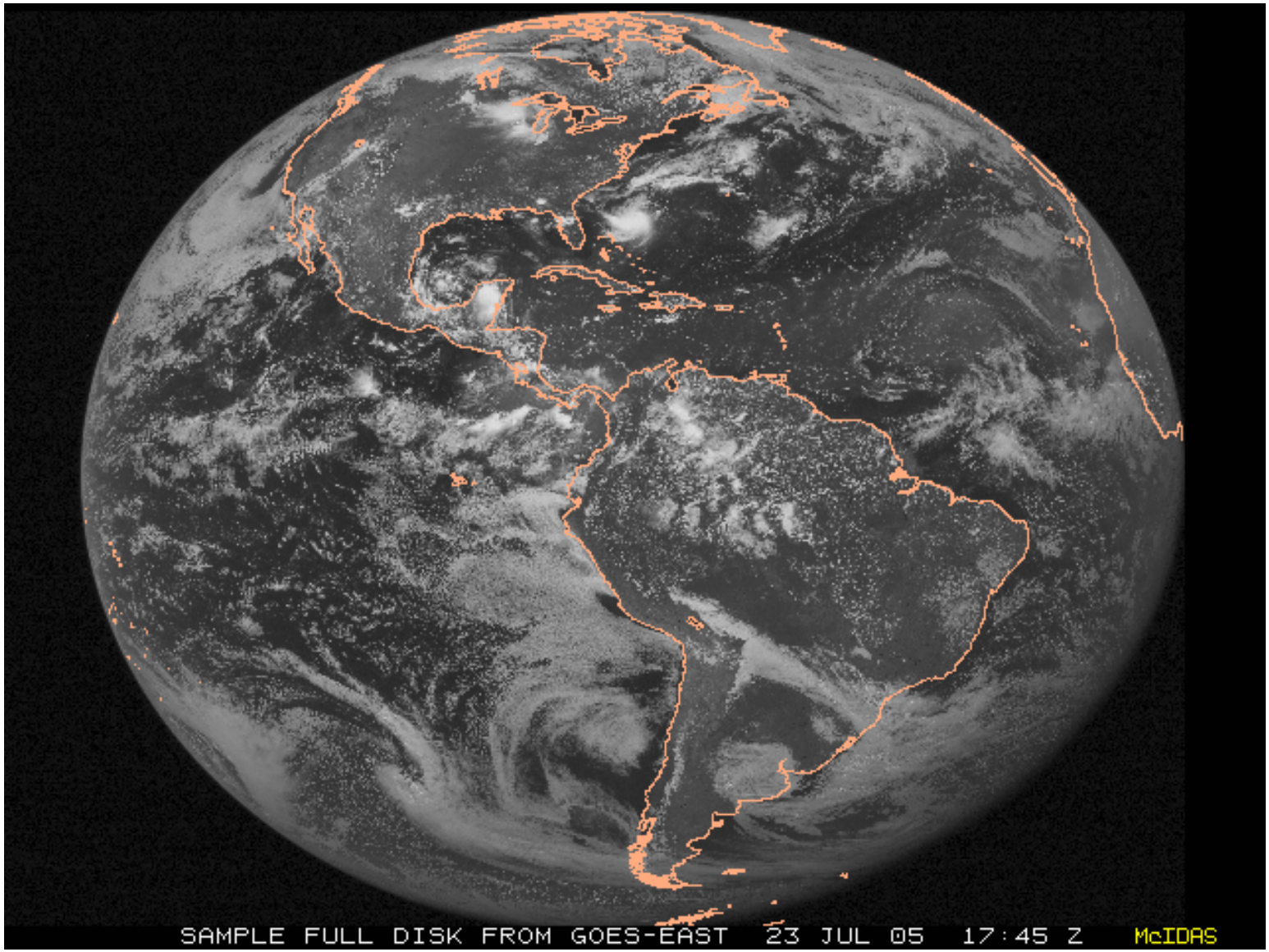
Combined 10-yr LIS/OTD for January



Combined 10-yr LIS/OTD for July

The Advanced Baseline Imager:

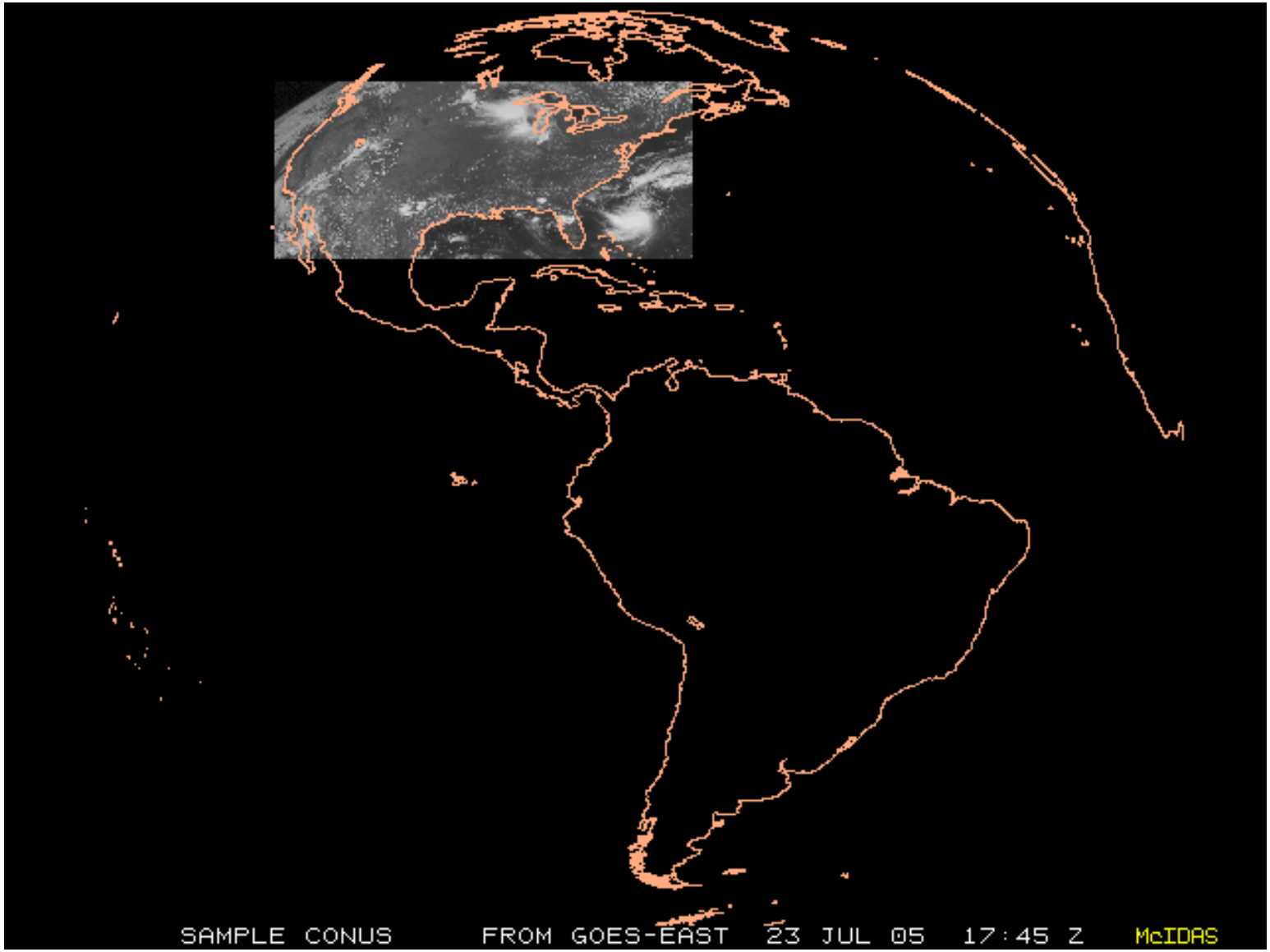
	ABI	Current
Spectral Coverage		
	16 bands	5 bands
Spatial resolution		
0.64 μm Visible	0.5 km	Approx. 1 km
Other Visible/near-IR	1.0 km	n/a
Bands (>2 μm)	2 km	Approx. 4 km
Spatial coverage		
Full disk	4 per hour	Every 3 hours
CONUS	12 per hour	~4 per hour
Mesoscale	Every 30 sec	n/a
Visible (reflective bands)		
On-orbit calibration	Yes	No



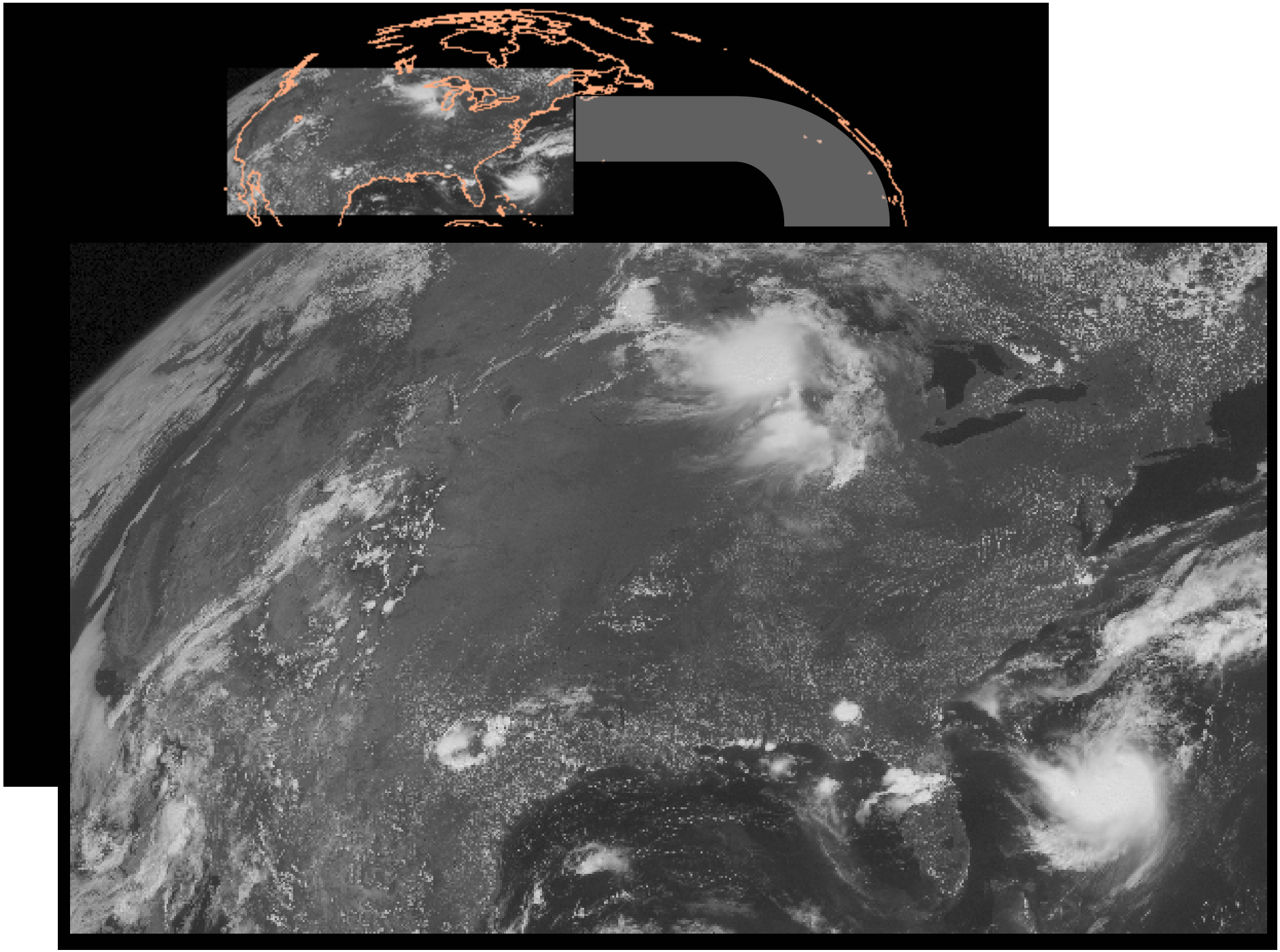
ABI scans about 5 times faster than the current GOES imager

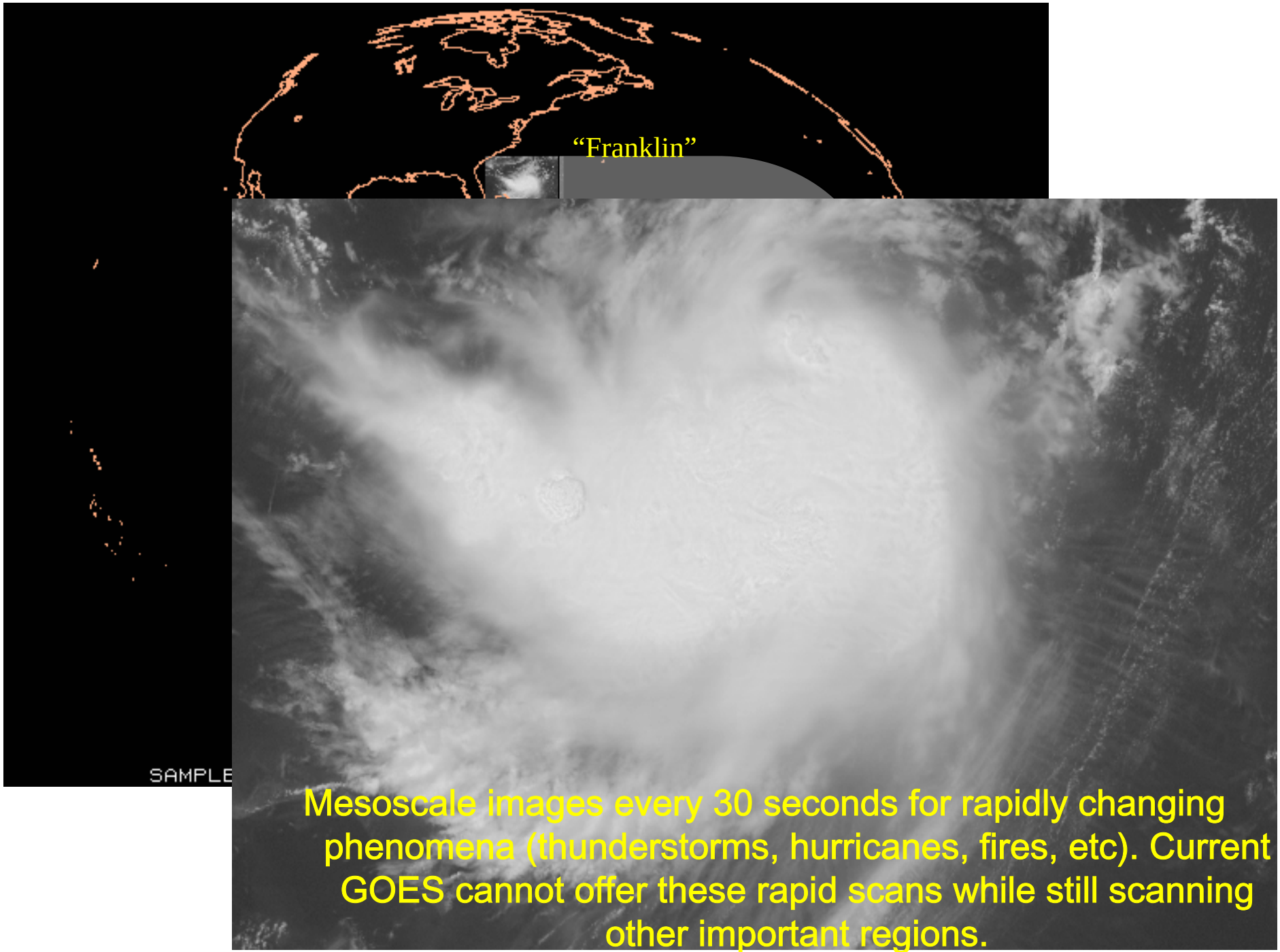
There are two anticipated scan modes for the ABI:

- Full disk images every 15 minutes + 5 min CONUS images + mesoscale.
 or - Full disk every 5 minutes.

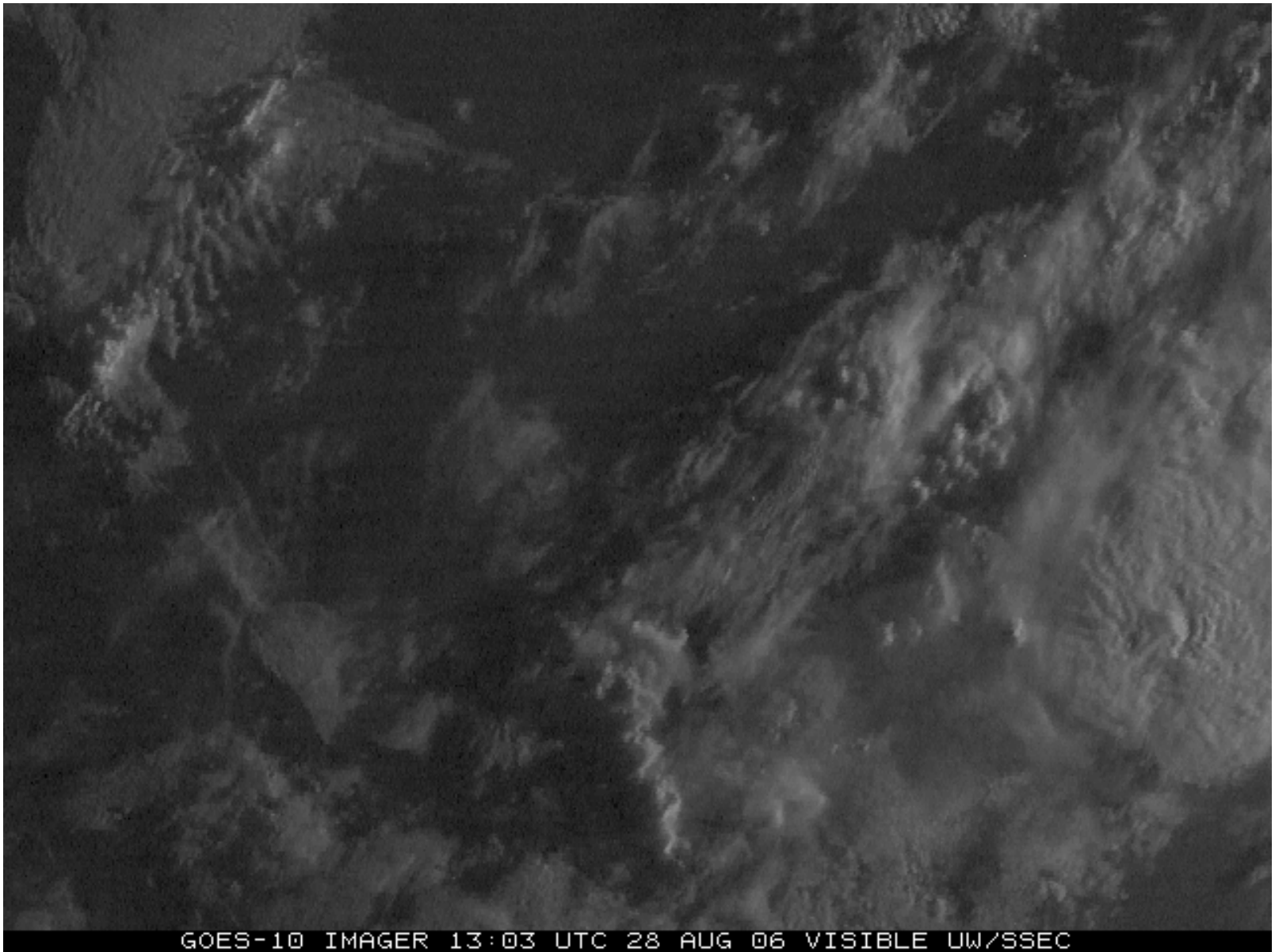


ABI can offer Continental US images every 5 minutes for routine monitoring of a wide range of events (storms, dust, clouds, fires, winds, etc). This is every 15 or 30 minutes with the current GOES in routine mode.

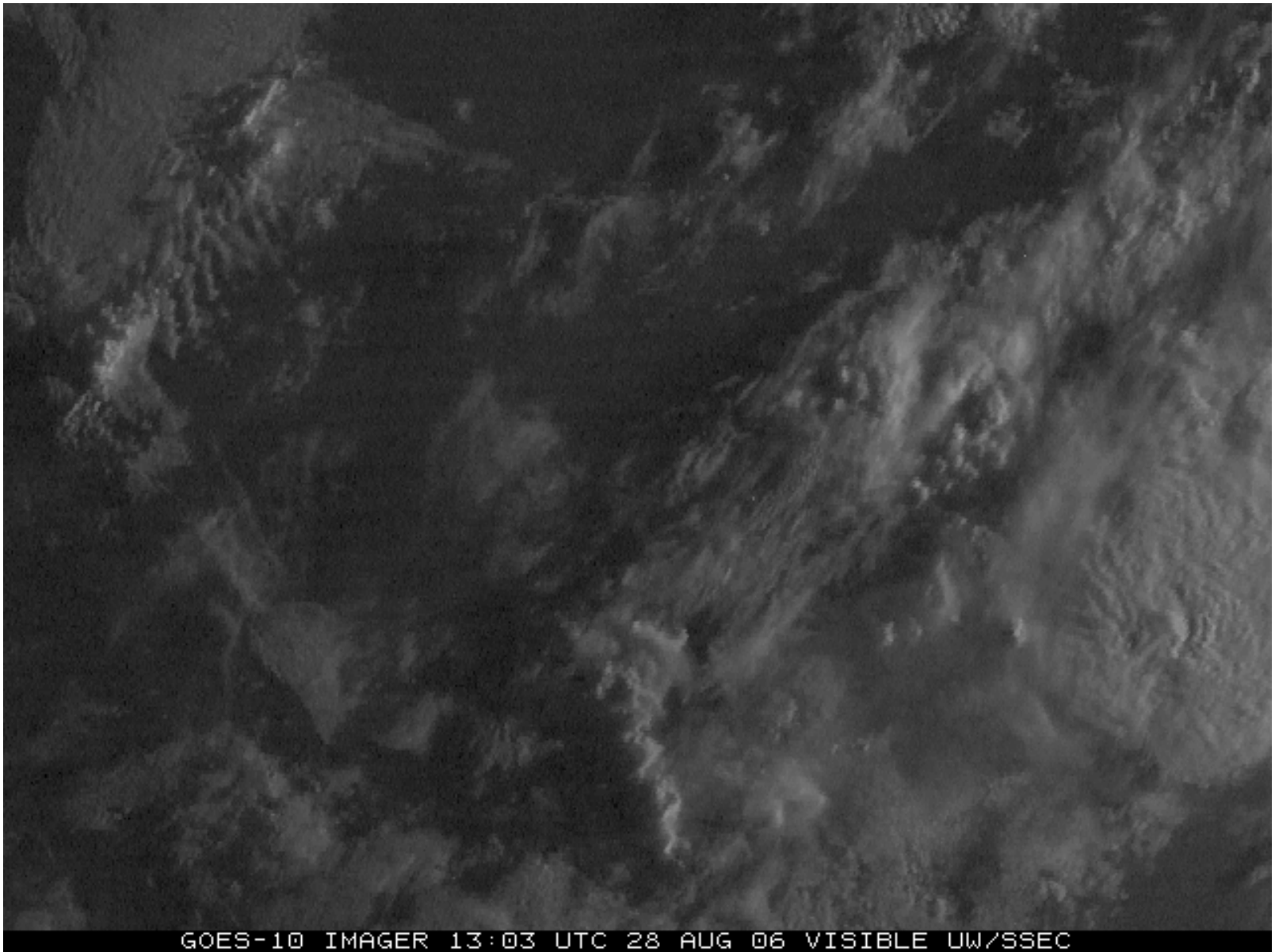



"Franklin"
SAMPLE
Mesoscale images every 30 seconds for rapidly changing phenomena (thunderstorms, hurricanes, fires, etc). Current GOES cannot offer these rapid scans while still scanning other important regions.

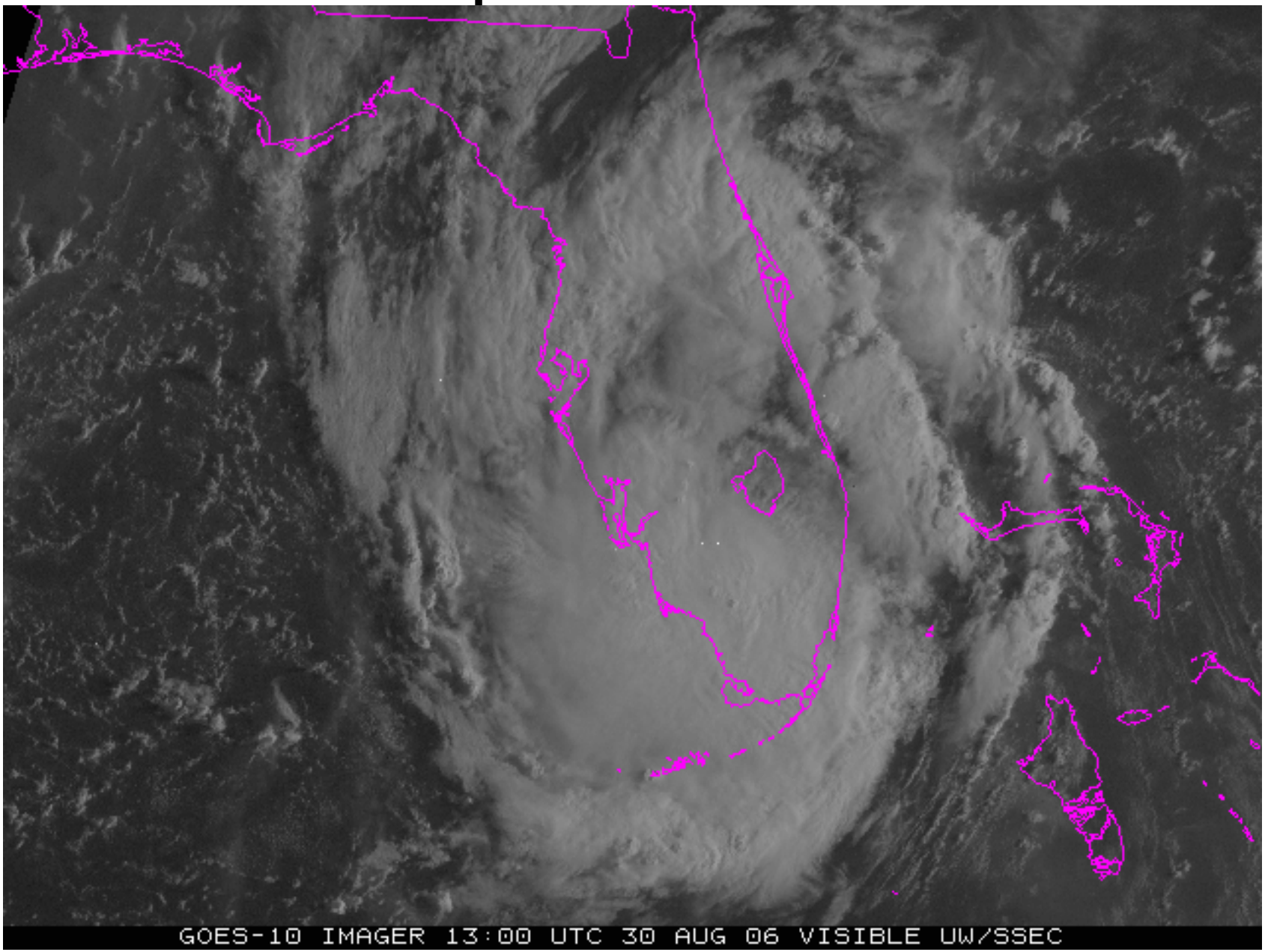
15-min time resolution “loop”



1-min time resolution loop



Ernesto – Special GOES-10 data



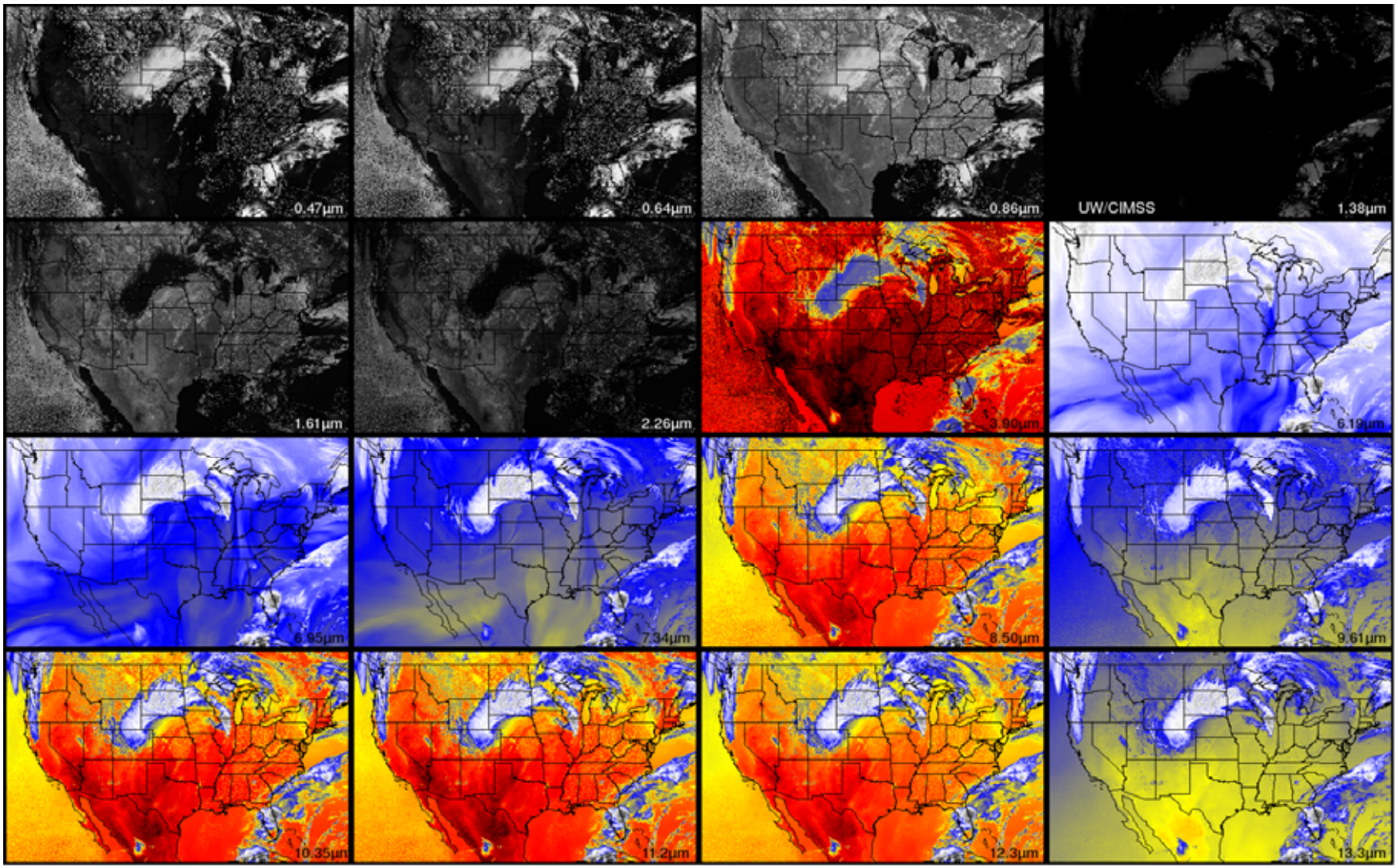
ABI Visible/Near-IR Bands

Future GOES imager (ABI) band	Wavelength range (μm)	Central wavelength (μm)	Nominal subsatellite IGFOV (km)	Sample use
1	0.45–0.49	0.47	1	Daytime aerosol over land, coastal water mapping
2	0.59–0.69	0.64	0.5	Daytime clouds fog, insolation, winds
3	0.846–0.885	0.865	1	Daytime vegetation/burn scar and aerosol over water, winds
4	1.371–1.386	1.378	2	Daytime cirrus cloud
5	1.58–1.64	1.61	1	Daytime cloud-top phase and particle size, snow
6	2.225–2.275	2.25	2	Daytime land/cloud properties, particle size, vegetation, snow

ABI IR Bands

7	3.80–4.00	3.90	2	Surface and cloud, fog at night, fire, winds
8	5.77–6.6	6.19	2	High-level atmospheric water vapor, winds, rainfall
9	6.75–7.15	6.95	2	Midlevel atmospheric water vapor, winds, rainfall
10	7.24–7.44	7.34	2	Lower-level water vapor, winds, and SO_2
11	8.3–8.7	8.5	2	Total water for stability, cloud phase, dust, SO_2 rainfall
12	9.42–9.8	9.61	2	Total ozone, turbulence, and winds
13	10.1–10.6	10.35	2	Surface and cloud
14	10.8–11.6	11.2	2	Imagery, SST, clouds, rainfall
15	11.8–12.8	12.3	2	Total water, ash, and SST
16	13.0–13.6	13.3	2	Air temperature, cloud heights and amounts

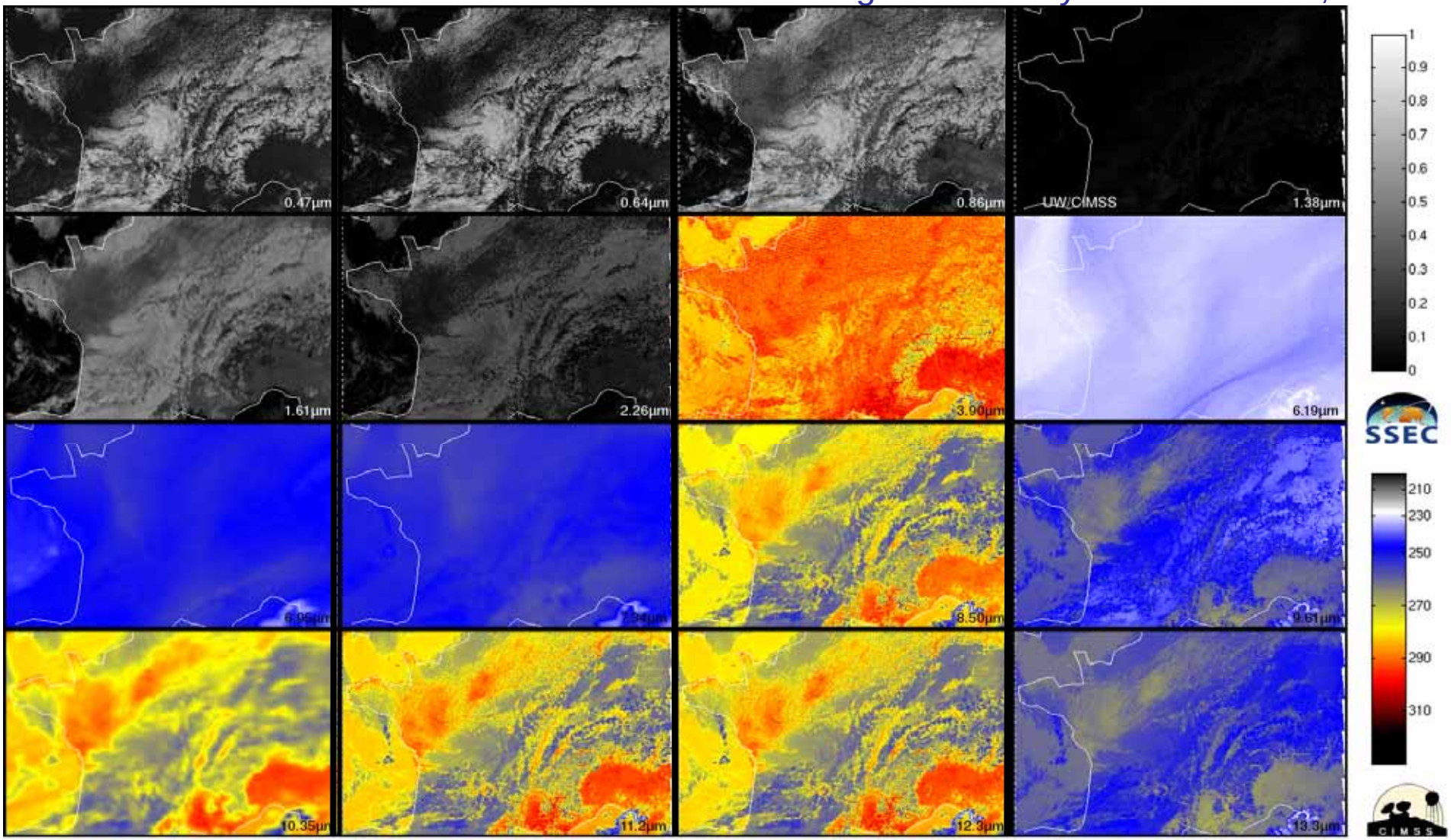
ABI bands via NWP simulation from the CIMSS AWG Proxy Team



ABI band data for 2005 June 04 18:00 UTC

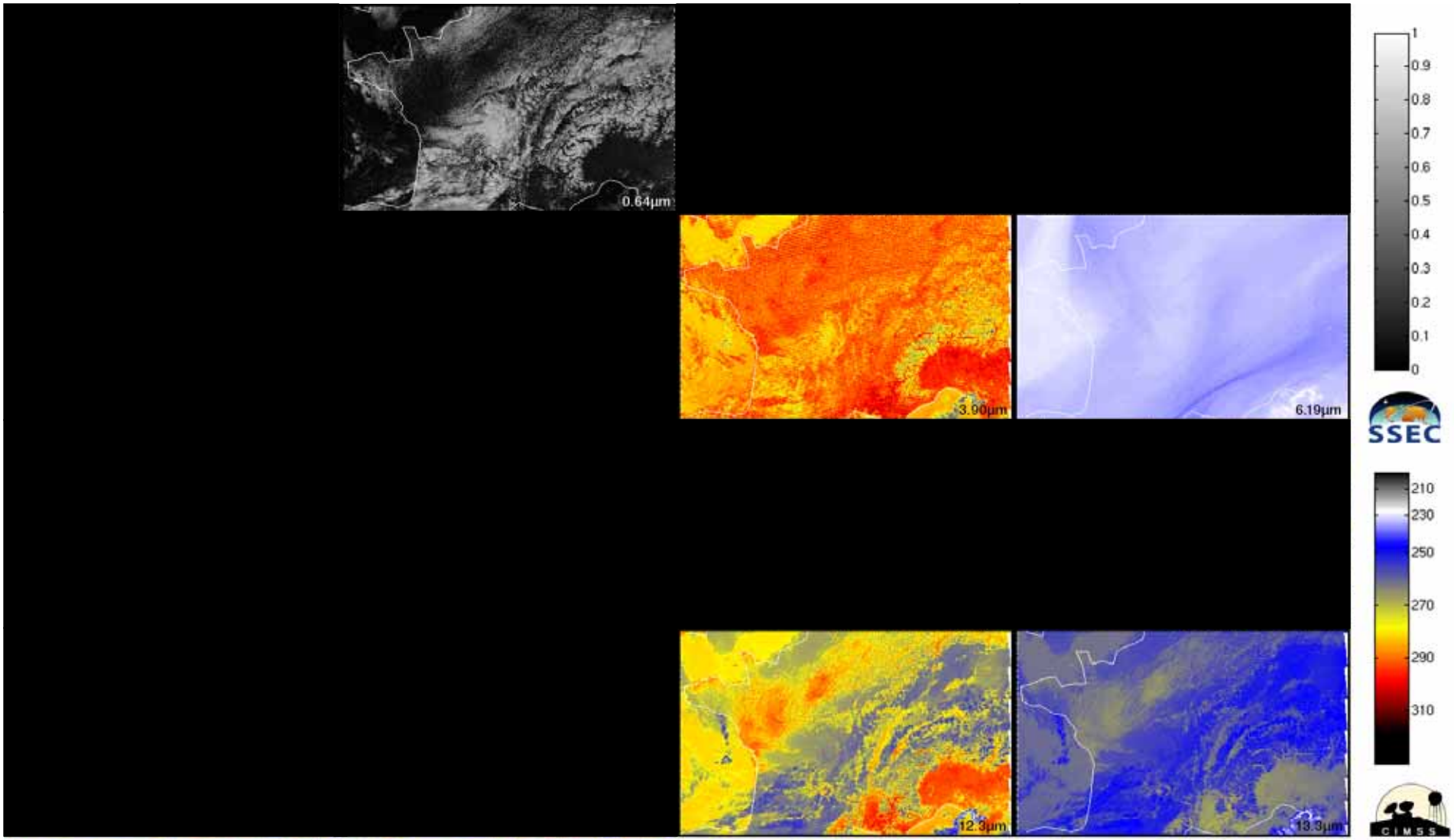
Using satellite observations (MODIS, MET-8 and AIRS) to simulate the ABI

Figure courtesy of M. Gunshor, CIMSS



ABI Simulated from MODIS, MSG, and AIRS on 2004 April 11

Similar bands on the GOES-12 Imager



ABI Simulated from MODIS, MSG, and AIRS on 2004 April 11

The additional bands on the Advanced Baseline Imager (ABI) allow new or improved products

Aerosols "0.47 μm"	Clouds, etc "0.64 μm"	Vegetation "0.86 μm"	Cirrus Clouds "1.38 μm"
Snow, Cloud phase "1.61 μm"	Particle size "2.26 μm"	Fog, Fires, clouds, etc "3.9 μm"	Water Vapor, Precip. "6.19 μm"
Water Vapor "6.95 μm"	WV, Upper-level SO2 "7.34 μm"	Vol. Ash, Cloud phase "8.5 μm"	Total Ozone "9.61 μm"
Surface features, clouds "10.35 μm"	Clouds, Precip., SST "11.2 μm"	Low-level Moisture "12.3 μm"	Cloud heights "13.3 μm"

Products

- Aerosol Detection (including Smoke
- Aerosol Particle Size
- Suspended Matter / Optical Depth
- *Volcanic Ash **
- Aircraft Icing Threat
- *Cloud Imagery: Coastal**
- Cloud & Moisture Imagery
- *Cloud Layers / Heights & Thickness*
- *Cloud Ice Water Path **
- Cloud Liquid Water
- Cloud Optical Depth
- Cloud Particle Size Distribution
- Cloud Top Phase
- *Cloud Top Height **
- *Cloud Top Pressure **
- *Cloud Top Temperature **
- Cloud Type
- Convection Initiation
- Enhanced "V" / Overshooting Top
- Hurricane Intensity
- Low Cloud & Fog
- Lightning Detection
- Turbulence
- Visibility

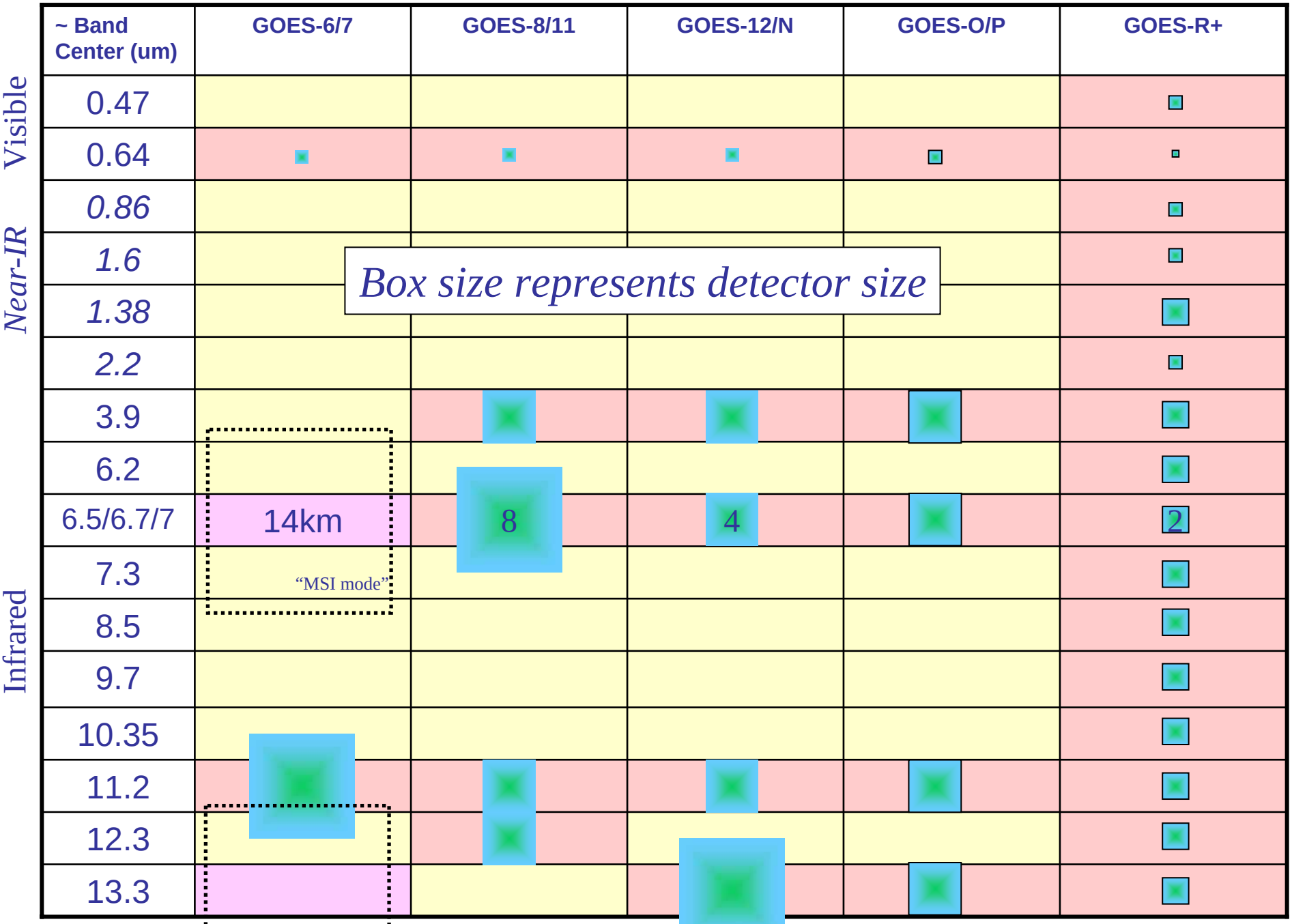
- Geomagnetic Field
- Probability of Rainfall
- Rainfall Potential
- Rainfall Rate / QPE
- *Legacy Afm. Vertical Moisture*
- *Legacy Afm. Vertical Temperature*
- *Derived Stability Indices **
- *Total Precipitable Water **
- *Total Water Content **
- Clear Sky Masks
- *Radiances **
- Absorbed Shortwave Radiation:
- Downward Longwave Radiation:
- Downward Solar Insolation: Surface
- Reflected Solar Insolation: TOA
- Upward Longwave Radiation *:
- *Ozone Total **
- *SO_2 Detection **
- *Derived Motion Winds **
- Fire / Hot Spot Characterization
- Flood / Standing Water
- *Land Surface (Skin) Temperature **

- Surface Albedo
- *Surface Emissivity **
- Vegetation Fraction: Green
- Vegetation Index
- Currents
- Sea & Lake Ice / Age
- Sea & Lake Ice / Concentration
- Sea & Lake Ice / Extent & Edge
- Sea & Lake Ice / Motion
- Ice Cover / Landlocked
- Snow Cover
- Snow Depth
- Sea Surface Temps
- Energetic Heavy Ions
- Mag Electrons & Protons: Low
- Mag Electrons & Protons: Med &
- Solar & Galactic Protons
- Solar Flux: EUV
- Solar Flux: X-Ray
- Solar Imagery: extreme UV / X-Ray

***** = *Products degraded from original GOES-R requirements (e.g.; no HES)*

ABI – Advanced Baseline Imager	Continuity of GOES Legacy Sounder Products from ABI	SEISS – Space Env. In-Situ Suite	EXIS – EUV and X-Ray Irradiance Sensors	GLM – Geostationary Lightning Mapper	Magnetometer	SUVI – Solar extreme UltraViolet Imager

Approximate spectral and spatial resolutions of US GOES Imagers



BAMS Article

INTRODUCING THE NEXT-GENERATION ADVANCED BASELINE IMAGER ON GOES-R

BY TIMOTHY J. SCHMIT, MATHEW M. GUNSHOR, W. PAUL MENZEL, JAMES J. GURKA, JUN LI, AND A. SCOTT BACHMEIER

The ABI will begin a new era in U.S. environmental remote sensing with more spectral bands, faster imaging, and higher spatial resolution than the current imager.

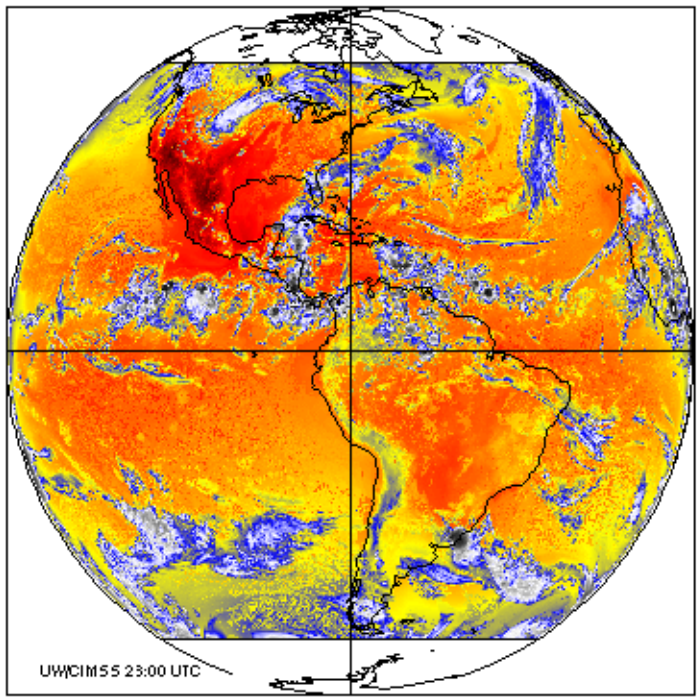
The Advanced Baseline Imager (ABI) is being developed as the future imager on the Geostationary Operational Environmental Satellite (GOES) series, slated to be launched in approximately 2012 with GOES-R (Gurka and Dittberner 2001). Similar to the current GOES imager, ABI will be used for a wide range of qualitative and quantitative weather, oceanographic, climate, and environmental applications. ABI will offer more spectral bands, higher spatial resolution, and faster imaging than the current GOES imager. ABI spatial resolution will be nominally 2 km for the infrared bands and 0.5 km for the 0.64-μm visible band. While the instrument will allow a flexible scanning scenario, two basic modes are envisioned. One mode is that every 15 min ABI will scan the full disk (FD), plus continental United States (CONUS) 3 times, plus a selectable 1000 km × 1000 km area every 30 s. The second mode is that the ABI can be programmed to scan the FD iteratively. The FD image can be acquired in approximately 5 min. Given that the current GOES imager takes approximately 25 min for a FD, this implies there will be a fivefold increase in the coverage rate.

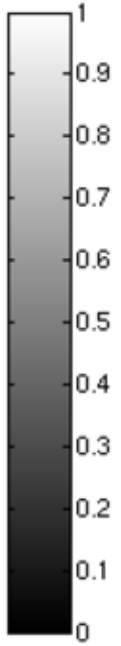
ABI has 16 spectral bands; five are similar to the 0.6-, 4-, 11-, and 12-μm windows and the 6.5-μm water vapor band on the current *GOES-8/-9/-10/-11* imagers (Menzel and Purdom 1994; Ellrod et al. 1998), and another is similar to the 13.3 μm on the *GOES-12/-N/-O/-P* imagers and the *GOES-8/-P* sounders (Hillger et al. 2003; Schmit et al. 2001, 2002). Additional bands on ABI are 0.47 μm for aerosol detection and visibility estimation; 0.865 μm for aerosol detection and estimation of vegetation health; 1.378 μm to detect very thin cirrus clouds; 1.6 μm for snow/cloud discrimination; 2.25 μm for aerosol and cloud particle size estimation, vegetation, cloud properties/screening, hot-spot detection, moisture

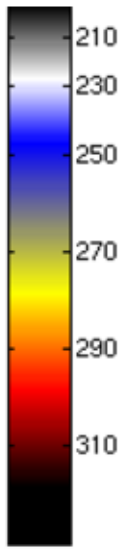
AFFILIATIONS: SCHMIT—NOAA/NESDIS, Office of Research and Applications, Advanced Satellite Products Team, Madison, Wisconsin; GUNSHOR, LI, AND BACHMEIER—Cooperative Institute for Meteorological Satellite Studies, University of Wisconsin—Madison, Madison, Wisconsin; MENZEL—NOAA/NESDIS, Office of Research and Applications, Madison, Wisconsin; AND GURKA—NOAA/NESDIS, Office of Systems Development, Silver Spring, Maryland
CORRESPONDING AUTHOR: Timothy J. Schmit, 1225 West Dayton St., Madison, WI 53706
E-mail: Tim.J.Schmit@noaa.gov
DOI:10.1175/BAMS-86-8-1079
In final form 14 March 2005

August 2005 AMS BAMS article by Schmit et al.

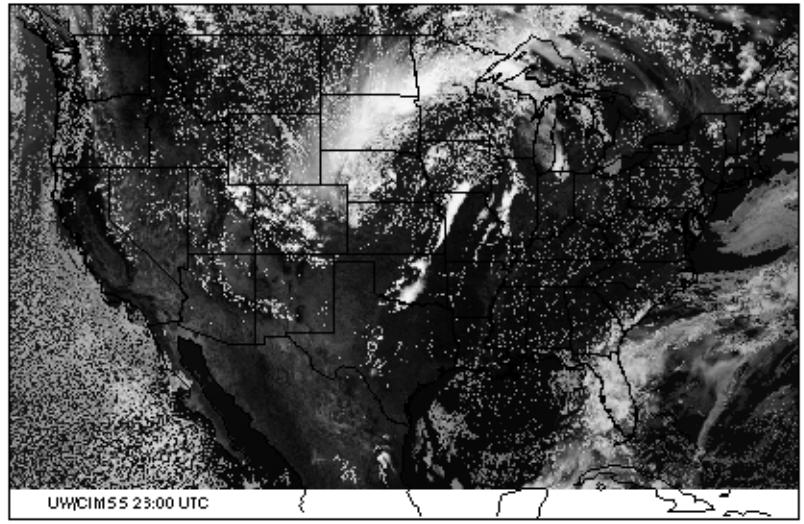
ABI band 14 (11.2 µm) BT (K) 2005-06-04



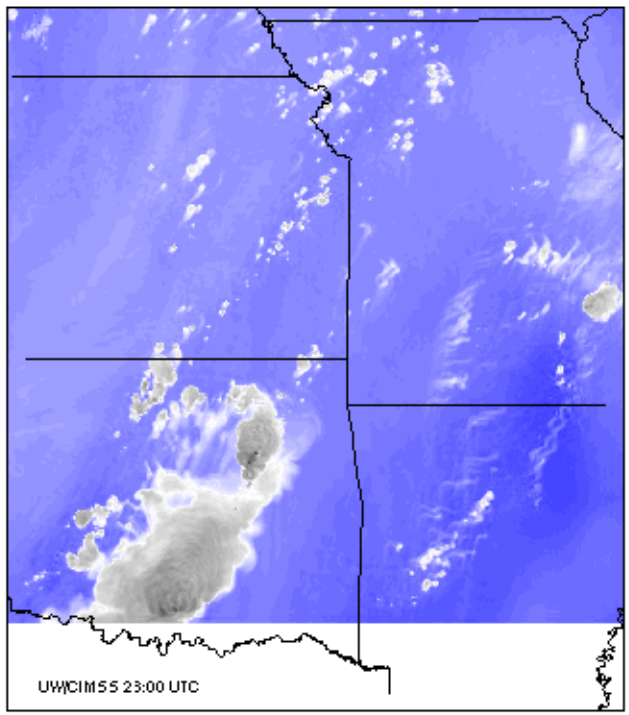




ABI band 2 (0.64 µm) reflectance 2005-06-04



ABI band 8 (6.19 µm) BT (K) 2005-06-04



SSEC

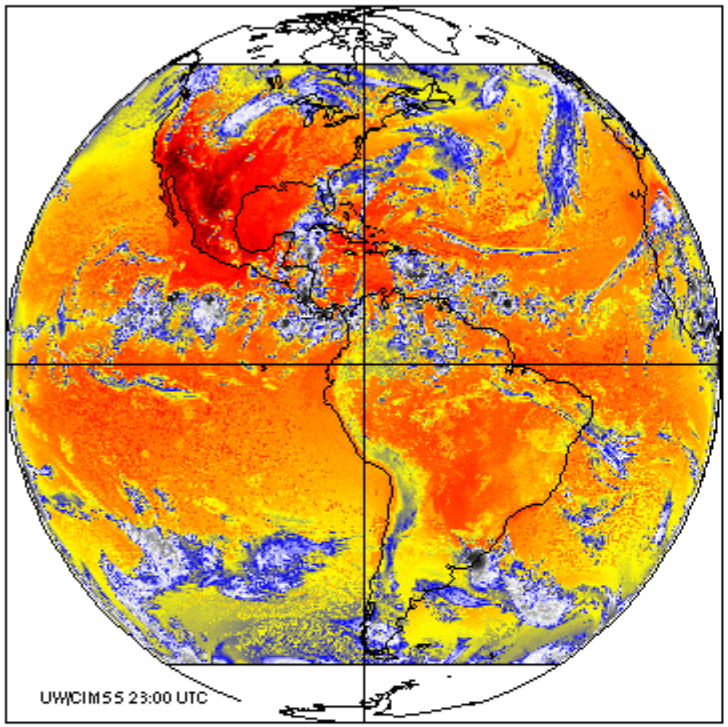
CIMSS

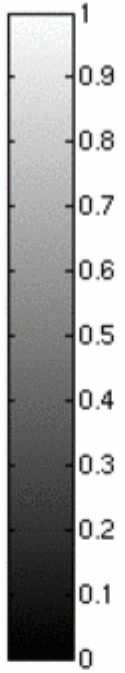
June 4, 2005 23:00 UTC

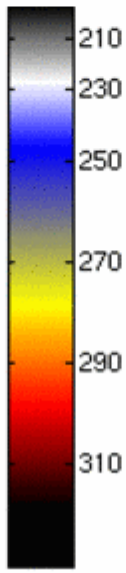
From CIMSS AWG Proxy Team

15 minutes of ABI

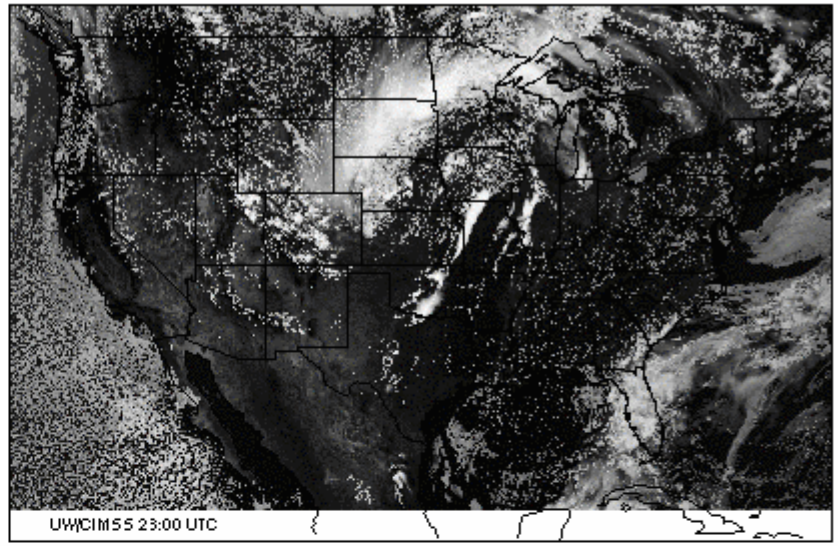
ABI band 14 (11.2 μm) BT (K) 2005-06-04



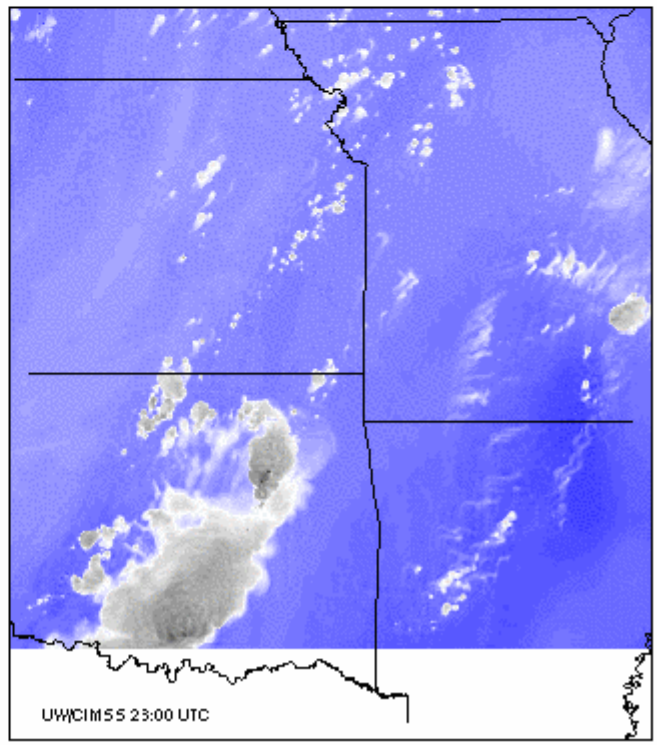




ABI band 2 (0.64 μm) reflectance 2005-06-04



ABI band 8 (6.19 μm) BT (K) 2005-06-04

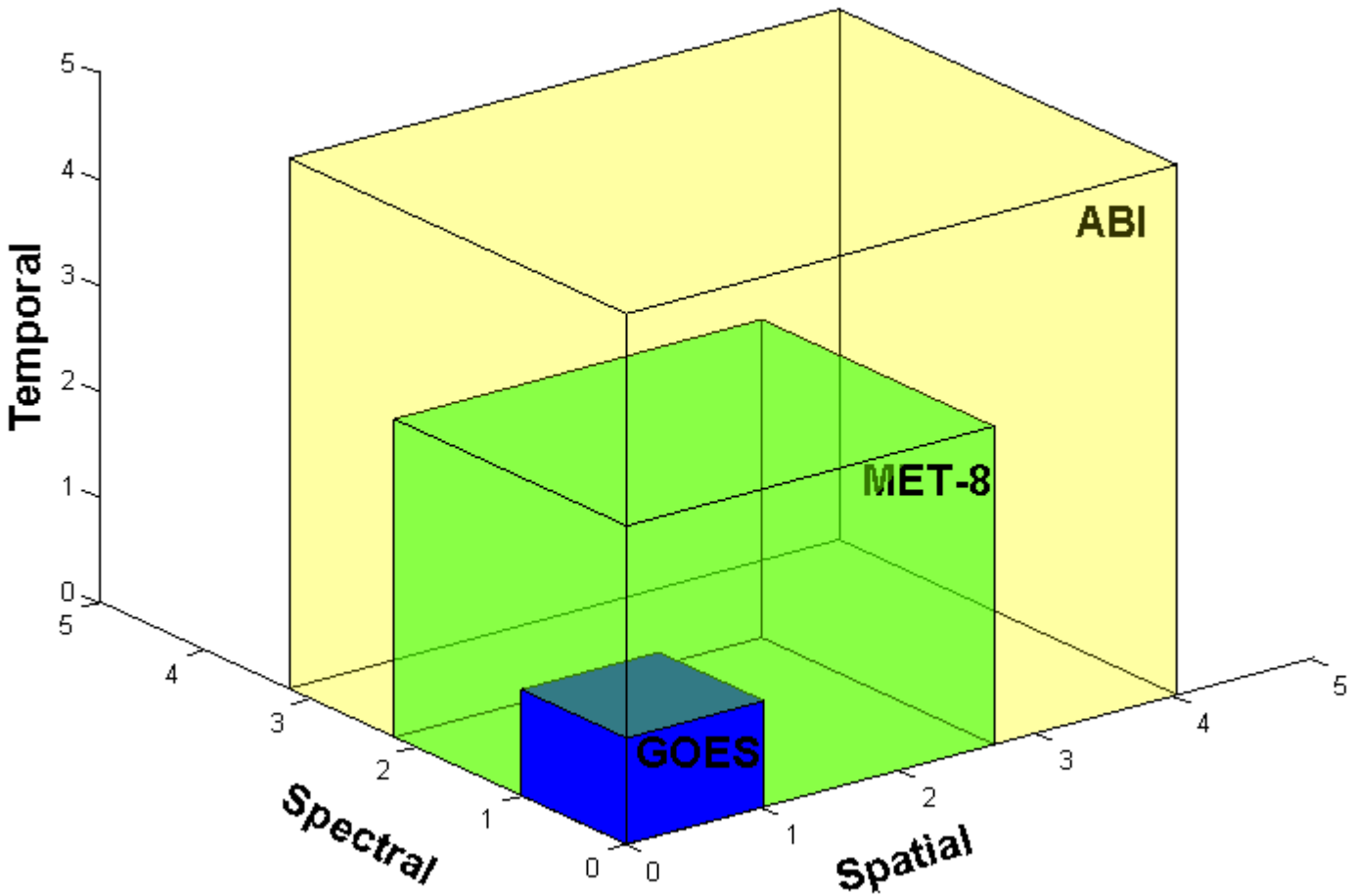


SSEC

CIMSS

June 4, 2005 23:00 UTC

“Improvement factors for GOES, MET-8 and ABI



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