



The GOES-R Series: Earth in High Definition

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GOES-R Series Program
Assistant System Program Director

34th Space Symposium

April 16, 2018



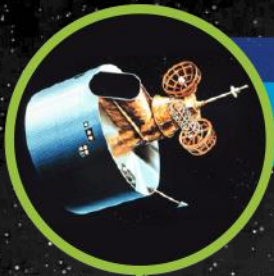


A History of GOES Weather Satellites



GOES 4-7

- Vertical Profiling



GOES 13,14,15

- Simultaneous, independent imaging, sounding



1975

1994

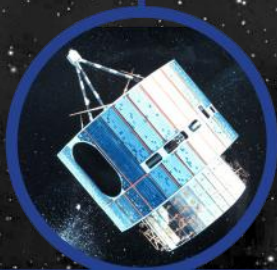
2016

1980

2006

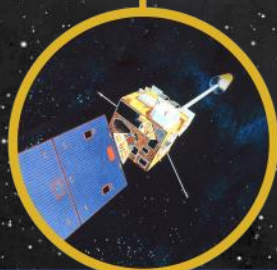
GOES 1-3

- NOAA's First GOES
- Spin-stabilized



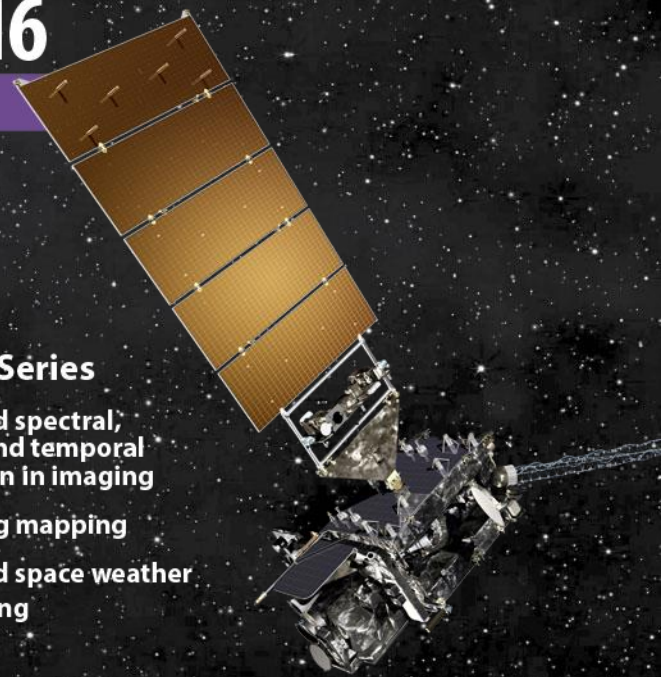
GOES 8-12

- 3-axis stabilized
- Simultaneous imaging, sounding 100% of time



GOES-R Series

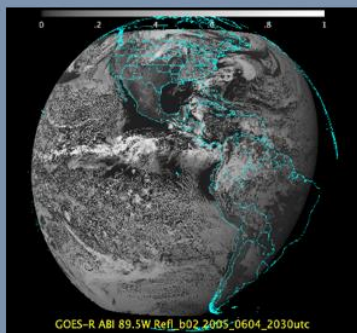
- Improved spectral, spatial and temporal resolution in imaging
- Lightning mapping
- Improved space weather monitoring



Why the GOES-R Series?

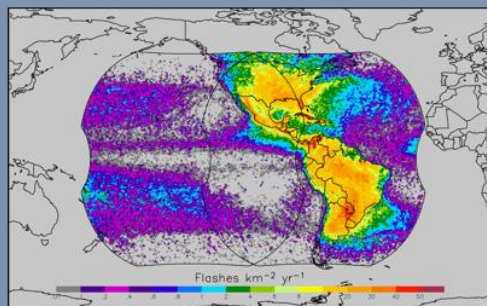
The GOES-R Series provides significant improvements in the detection and observations of meteorological phenomena that directly impact public safety, protection of property, and our Nation's economic health and prosperity.

ABI



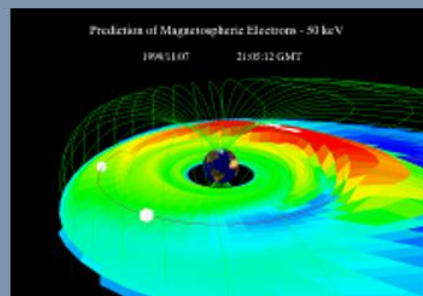
Visible & IR Imagery

GLM



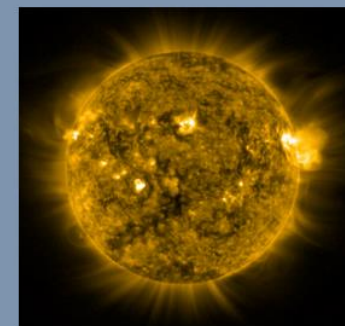
Lightning Mapping

SEISS and MAG



Space Weather Monitoring

EXIS and SUVI



Solar Imaging

- ✓ Improved hurricane track & intensity forecasts
- ✓ Increased thunderstorm & tornado warning lead time
- ✓ Improved aviation route planning
- ✓ Better fire detection and intensity estimation
- ✓ Improved detection of low cloud/fog

- ✓ Improved solar flare warnings for communications and navigation disruptions
- ✓ More accurate monitoring of energetic particles responsible for radiation hazards to humans and spacecraft
- ✓ Better monitoring of Coronal Mass Ejections to improve geomagnetic storm forecasting

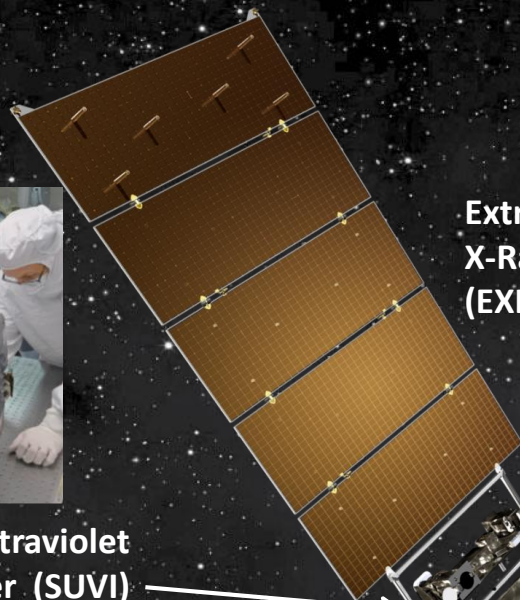
GOES-R Series Spacecraft



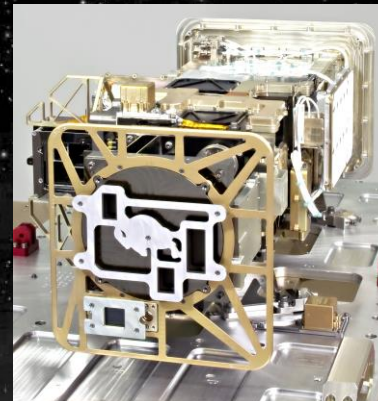
Solar Ultraviolet Imager (SUVI)



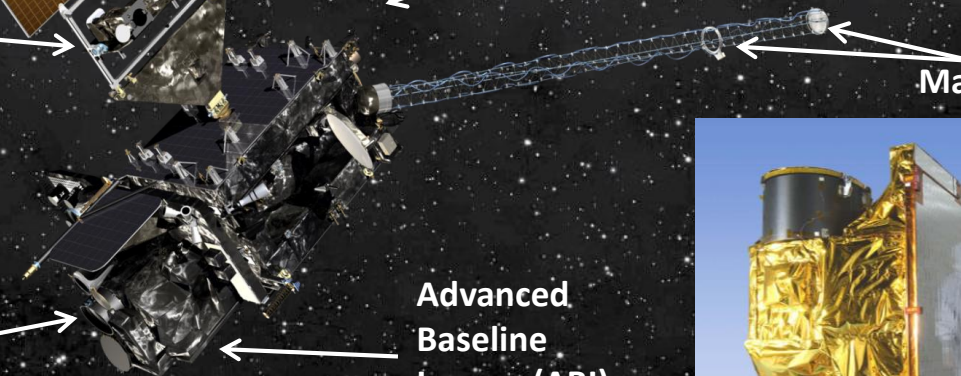
Geostationary Lightning Mapper (GLM)



Extreme Ultraviolet and X-Ray Irradiance Sensor (EXIS)



Space Environment In-Situ Suite (SEISS)



Magnetometer



Advanced Baseline Imager (ABI)

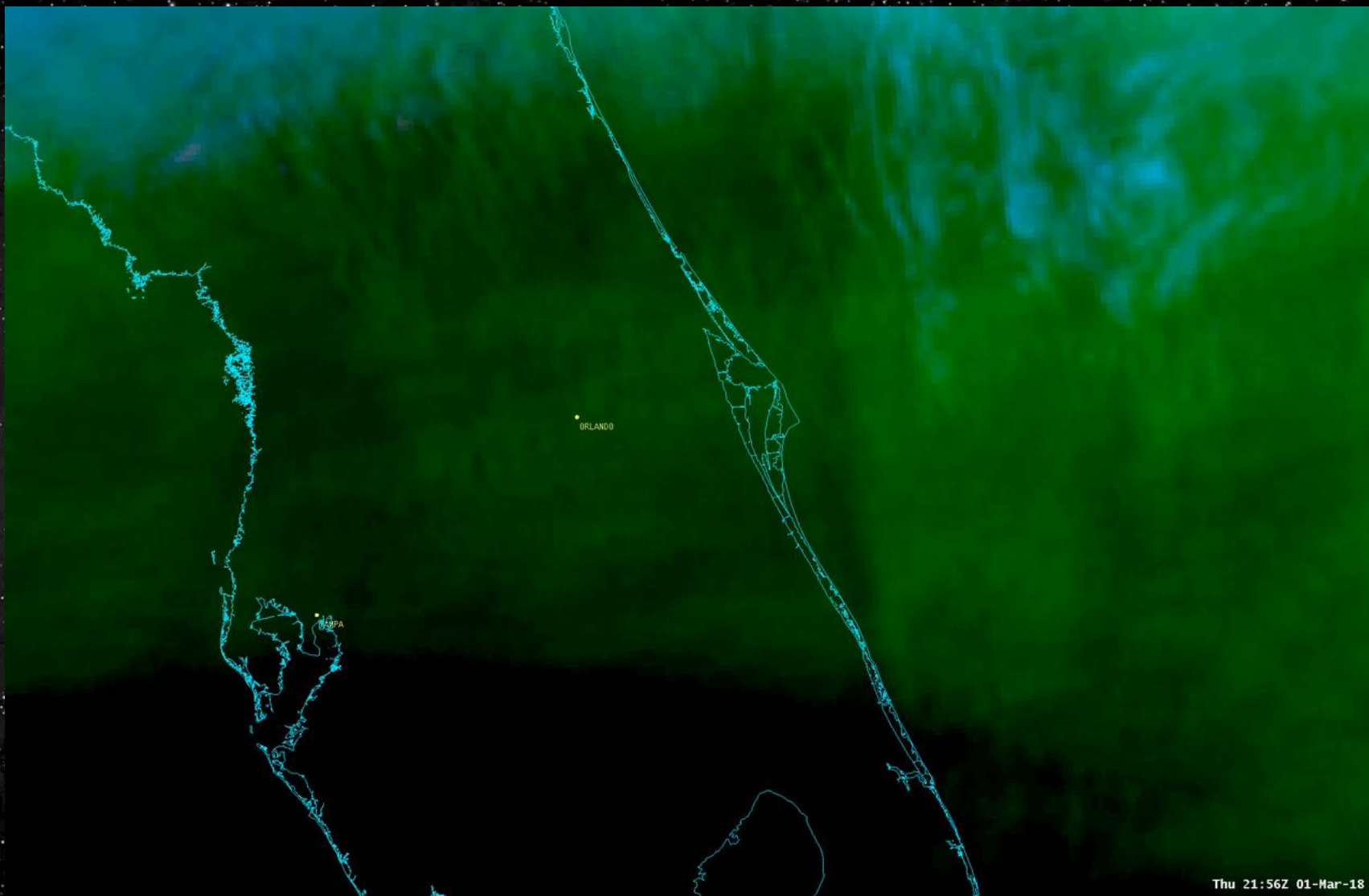


GOES-R and GOES-S Launches





GOES-16 Sees GOES-S Launch



Thu 21:56Z 01-Mar-18

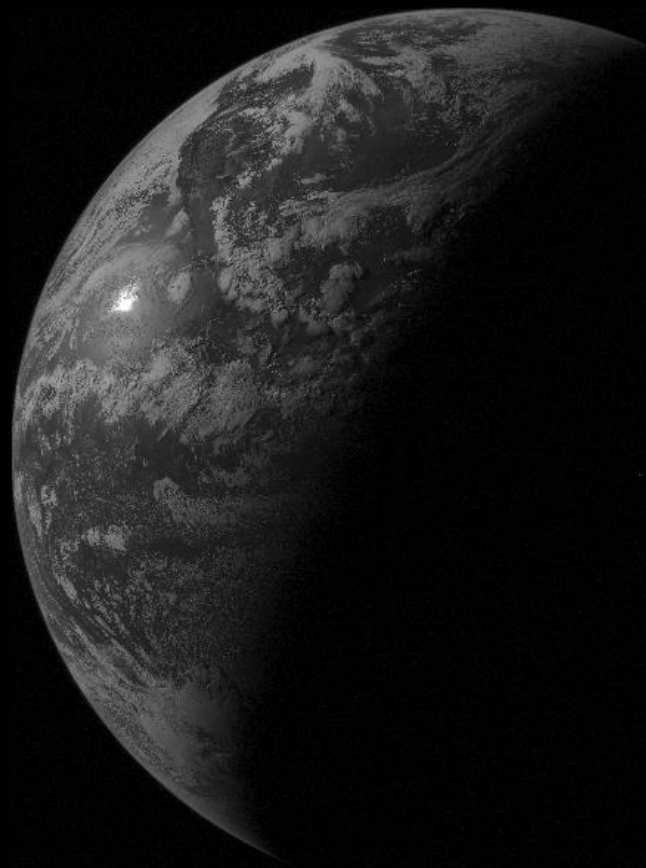
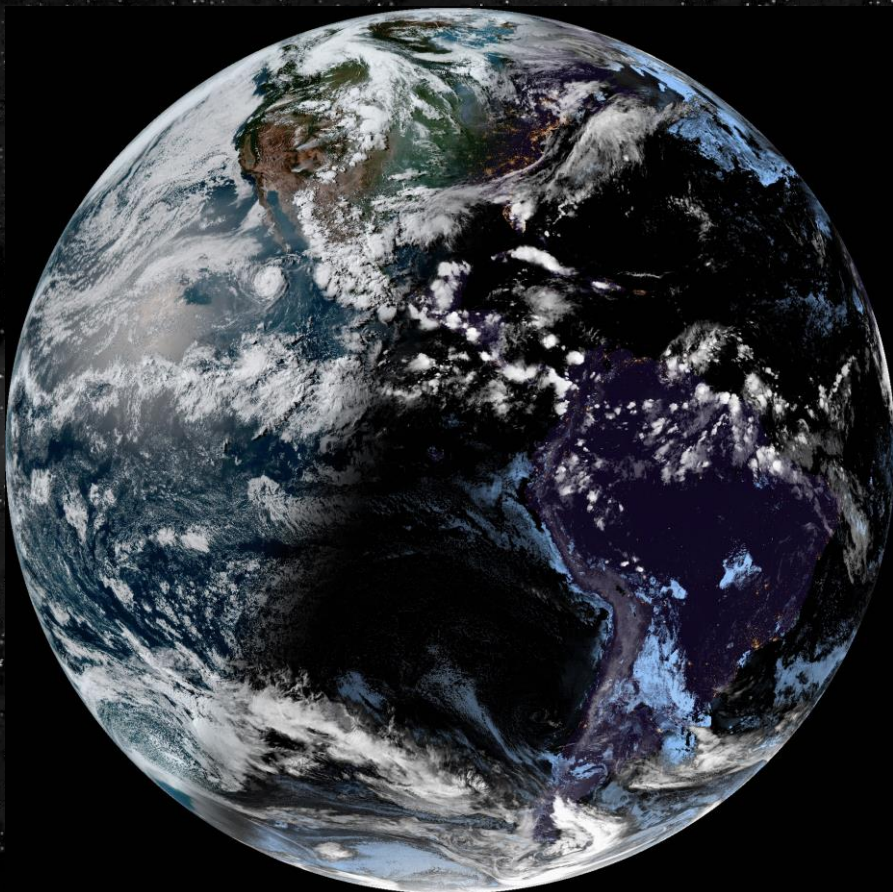


Full Disk Imagery Increased From 8X to 96X per Day



GOES-16 every 15 minutes

GOES-13 every 3 hours



1010101 G-13 IMG 1 27 JUN 17178 234500 02490 05774 18.00

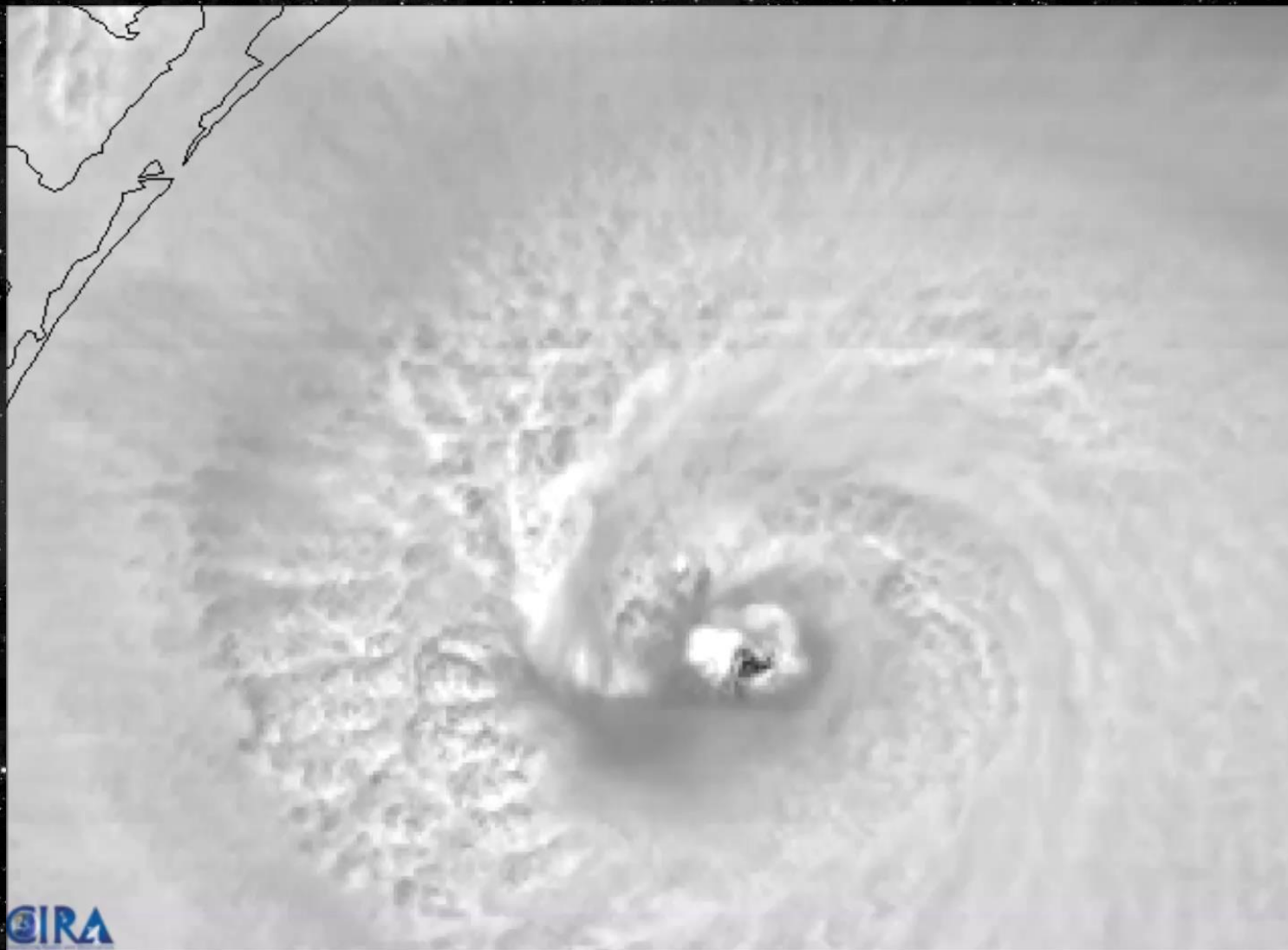


GOES-16 Highlights

Eye of Hurricane Harvey



August 25, 2017



CIRA

0101 G-16 IMG 2 25 AUG 17237 180125 00628 00714 00.50

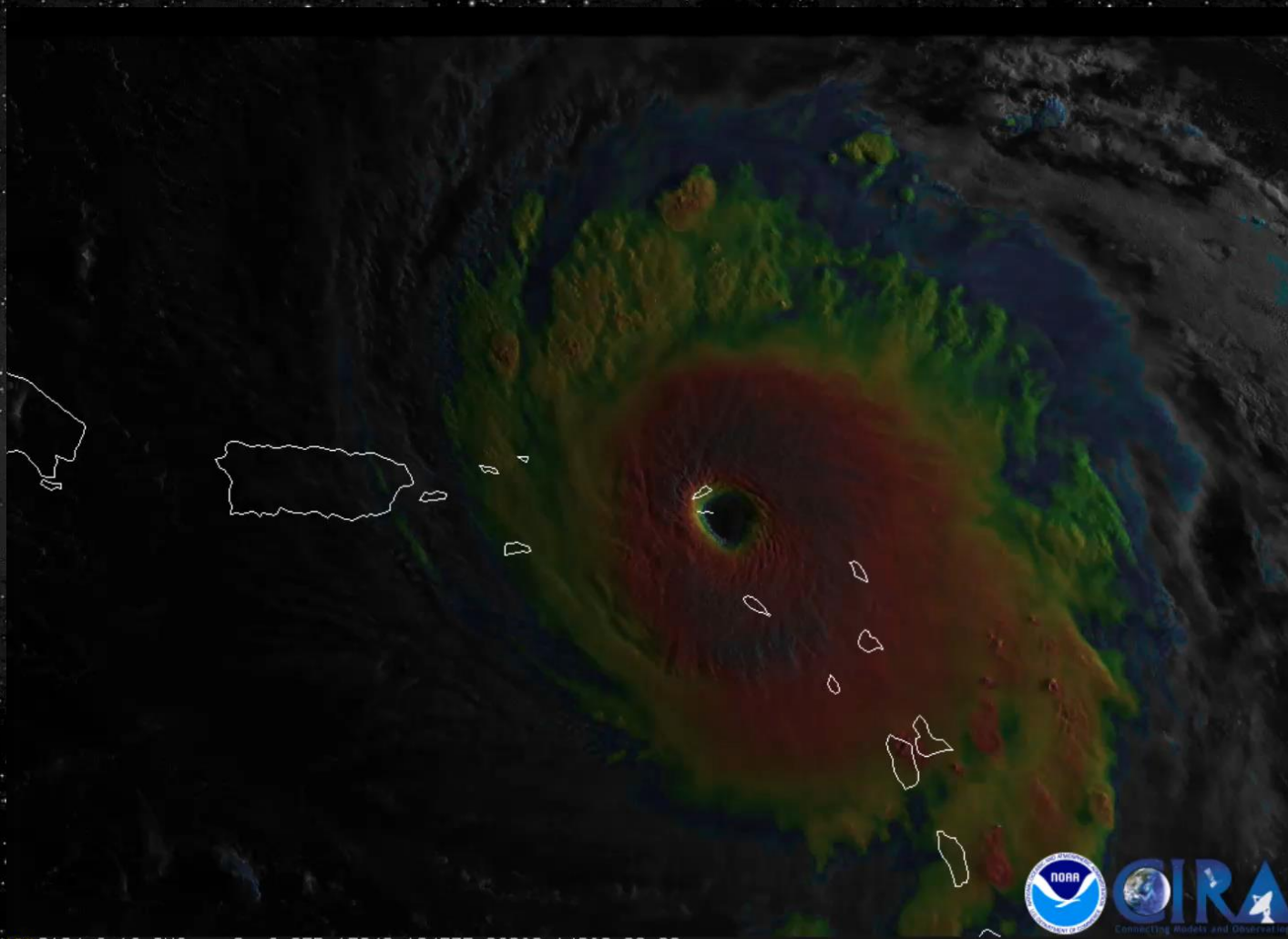


GOES-16 Highlights



Visible/IR "Sandwich" Hurricane Irma

September 6, 2017



1040104 G-16 IMG 2 6 SEP 17249 104535 06282 14982 02.00



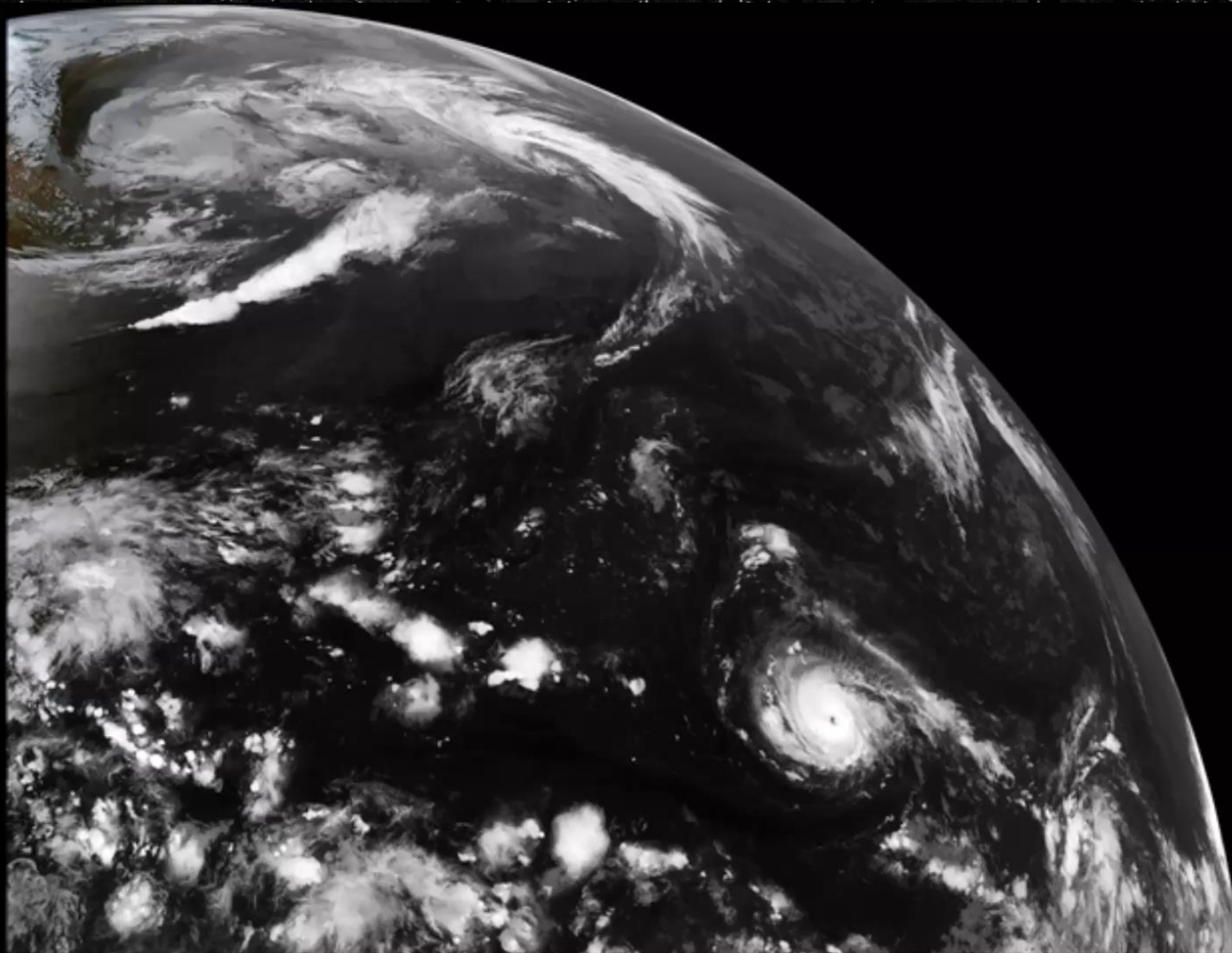


GOES-16 Highlights

Hurricanes Katia, Irma, José



September 5-11, 2017

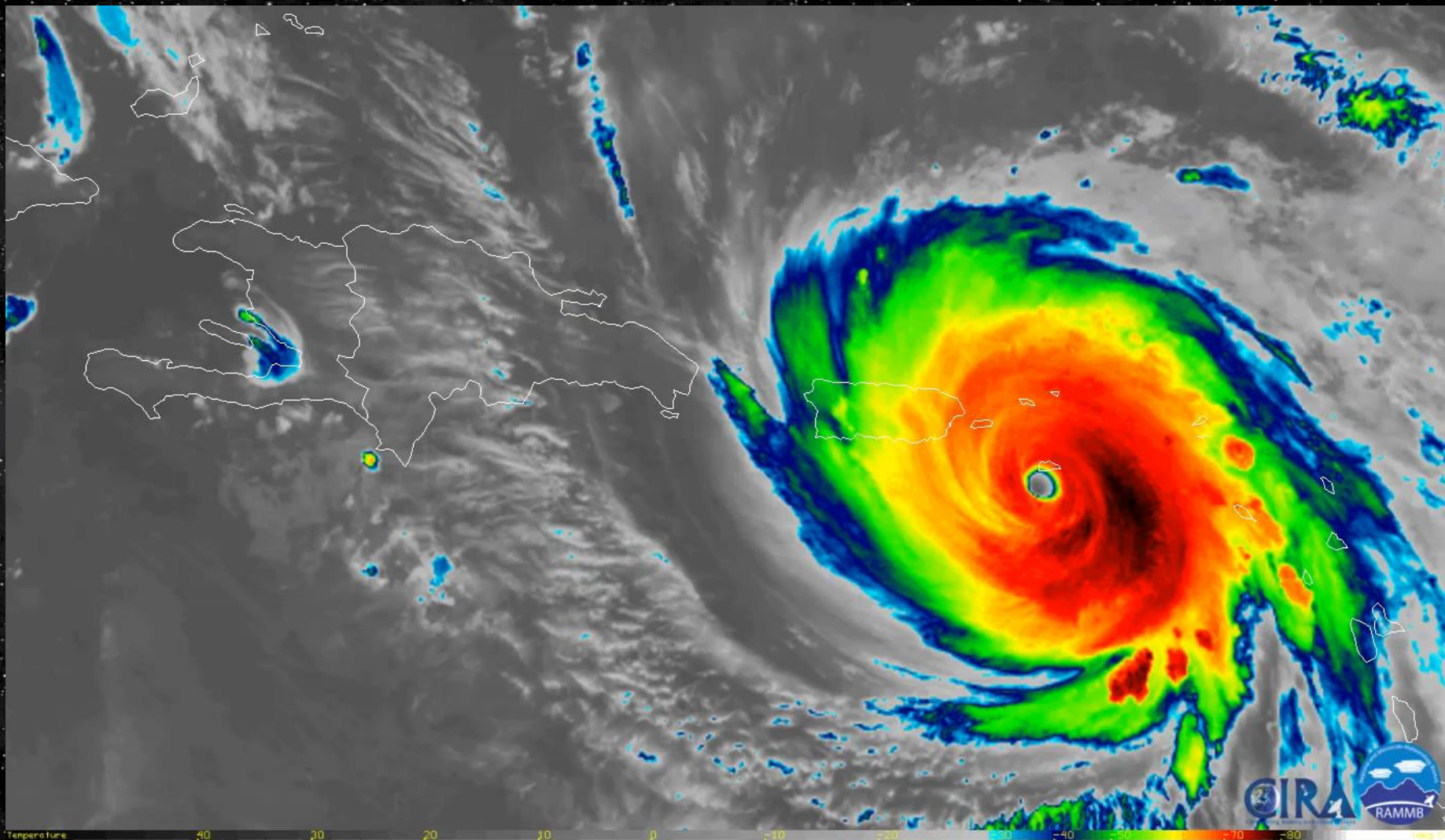




GOES-16 Highlights Hurricane Maria



September 20, 2017



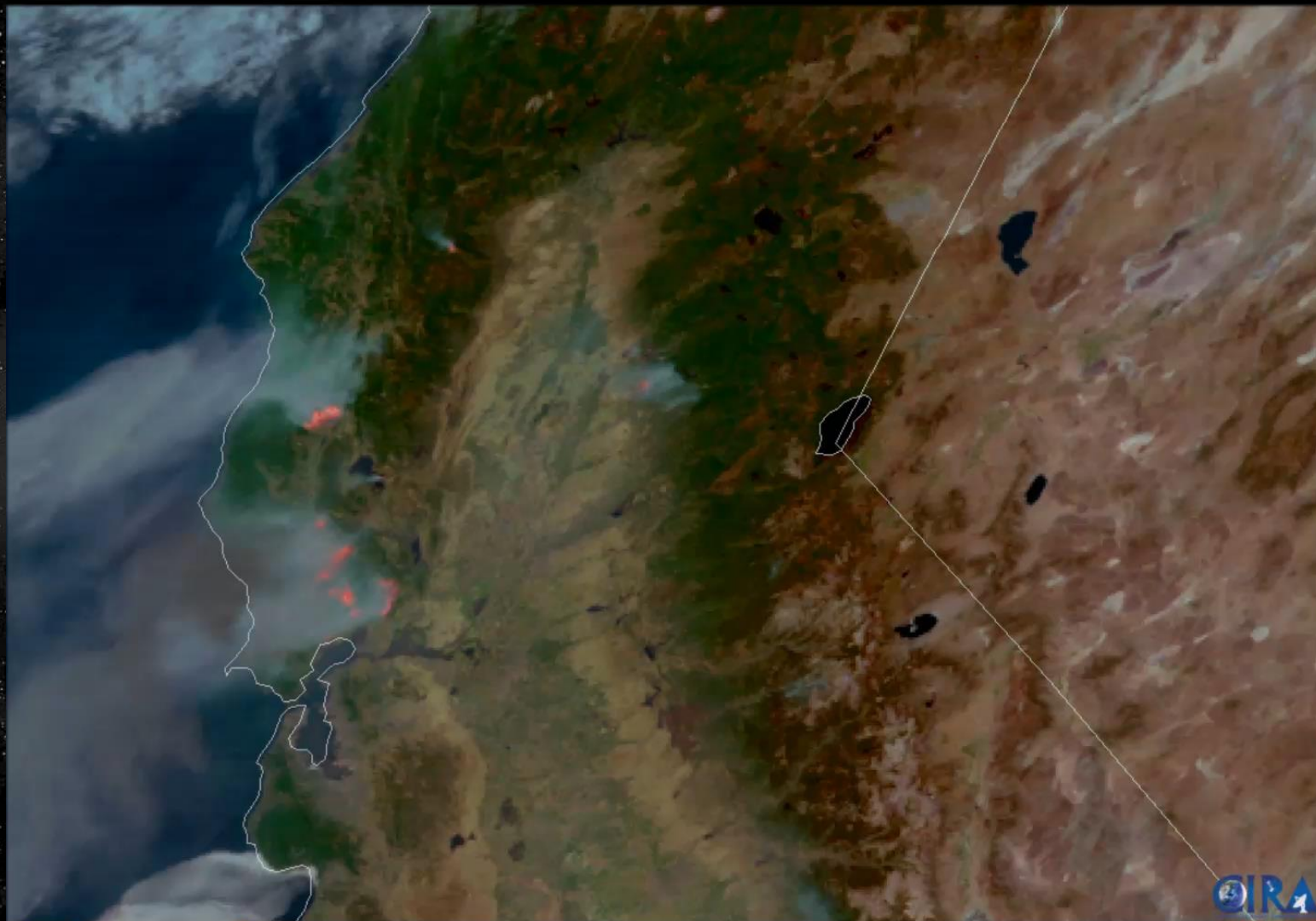


GOES-16 Highlights

Fires Raging in California



October 9, 2017



2 0002 G-16 IMG 2 9 OCT 17282 200200 01201 00001 01 00



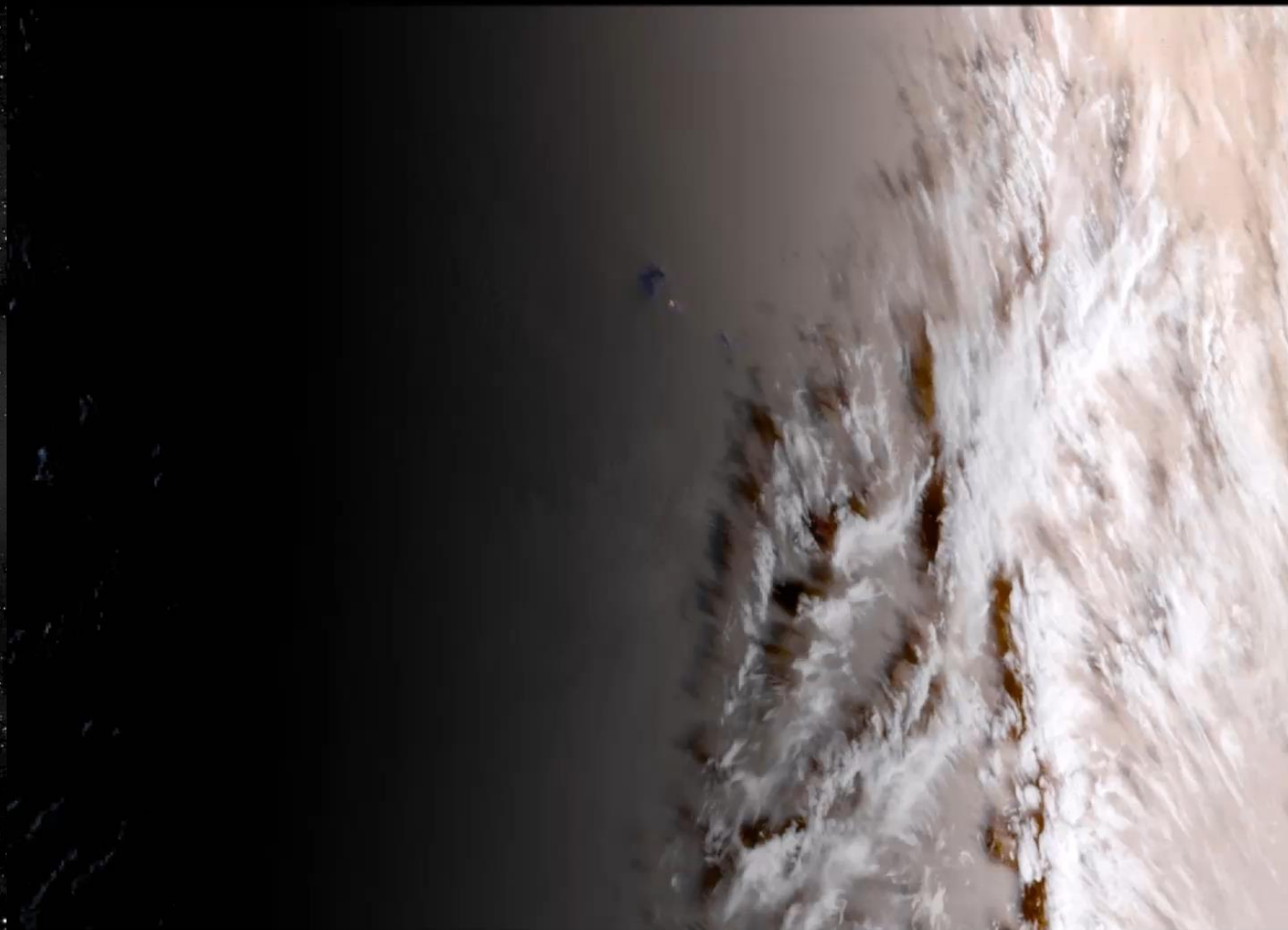


GOES-16 Highlights



Von Kármán Vortex Streets in the Saharan Air Layer

January 22, 2018



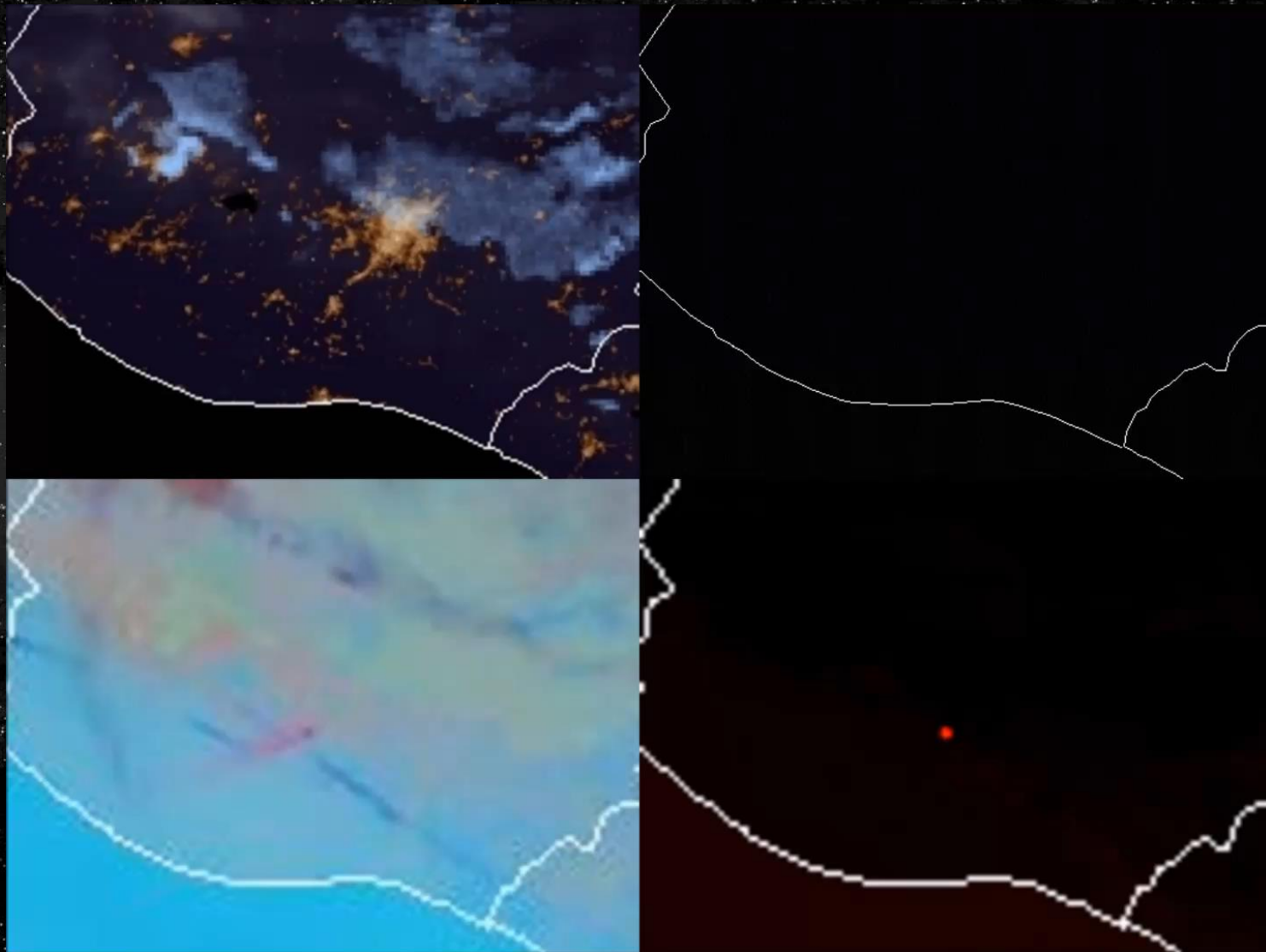


GOES-16 Highlights



Four Views of Volcán de Fuego Eruption

February 1, 2018





GOES-16 Highlights

2018 Bomb Cyclone



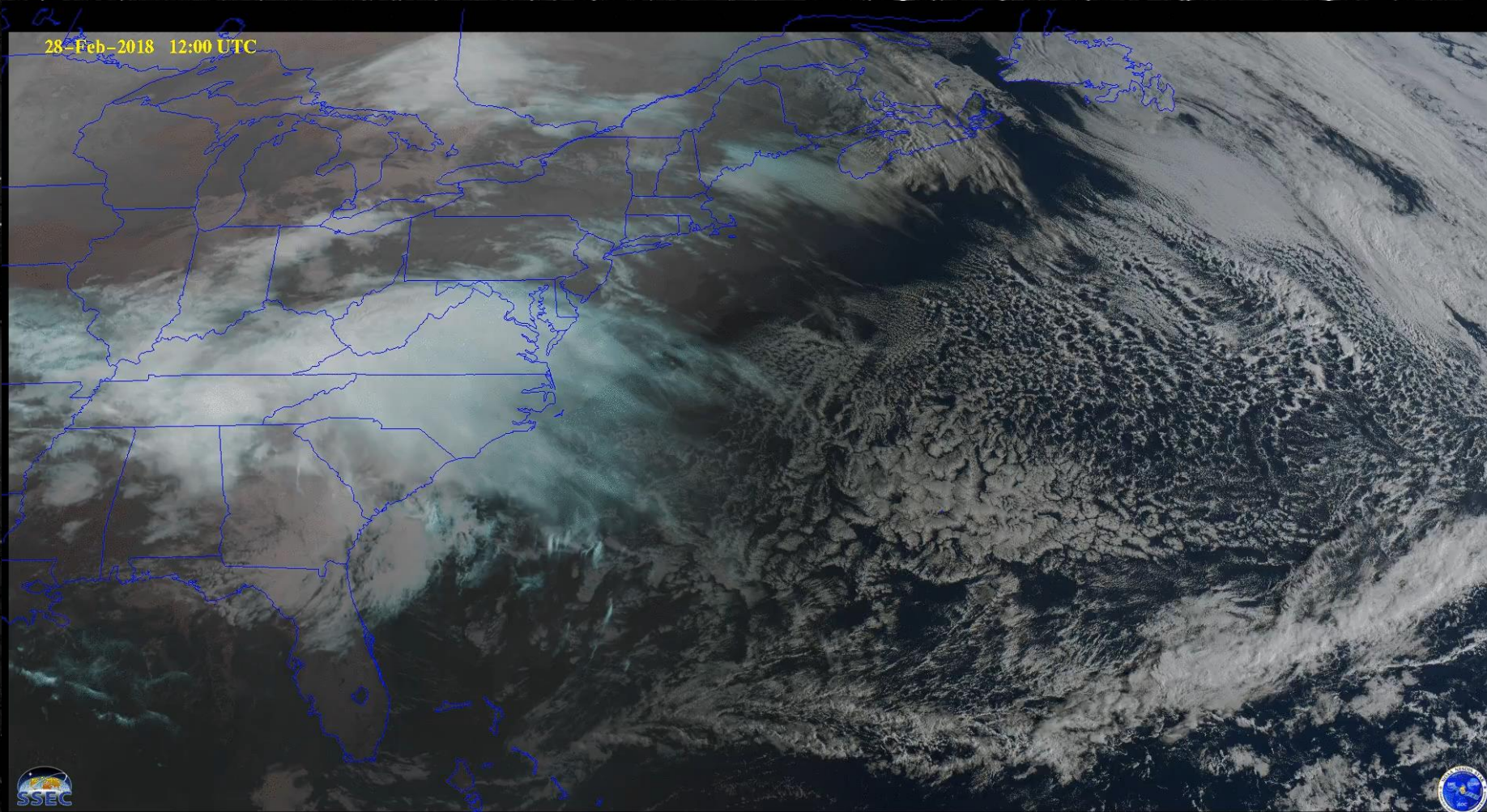
January 4, 2018





GOES-16 Highlights 'Foureaster'

Feb. 28 – March 24, 2018





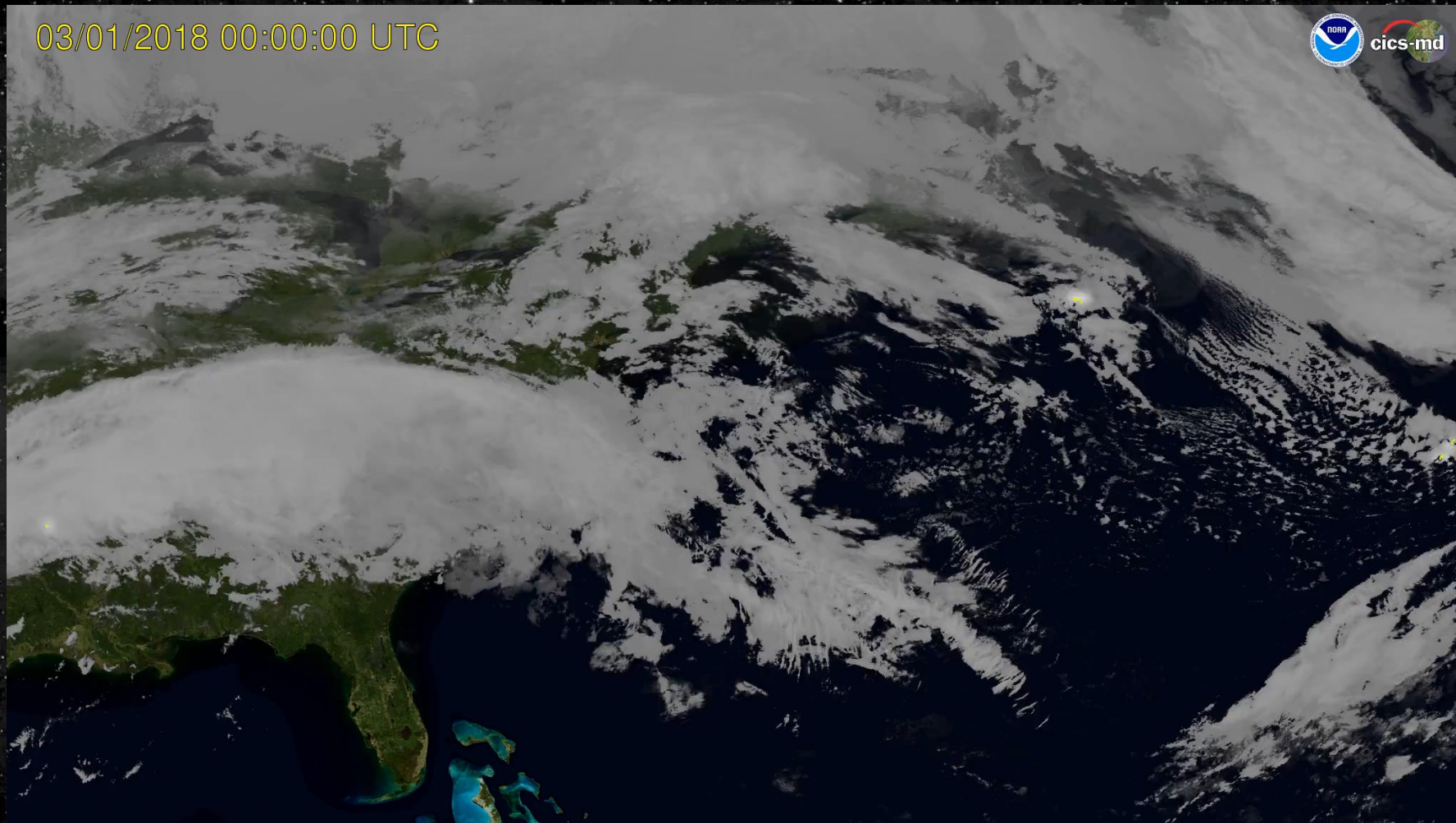
GOES-16 Highlights

Lightning Associated with Nor'easter



March 1-7, 2018

03/01/2018 00:00:00 UTC





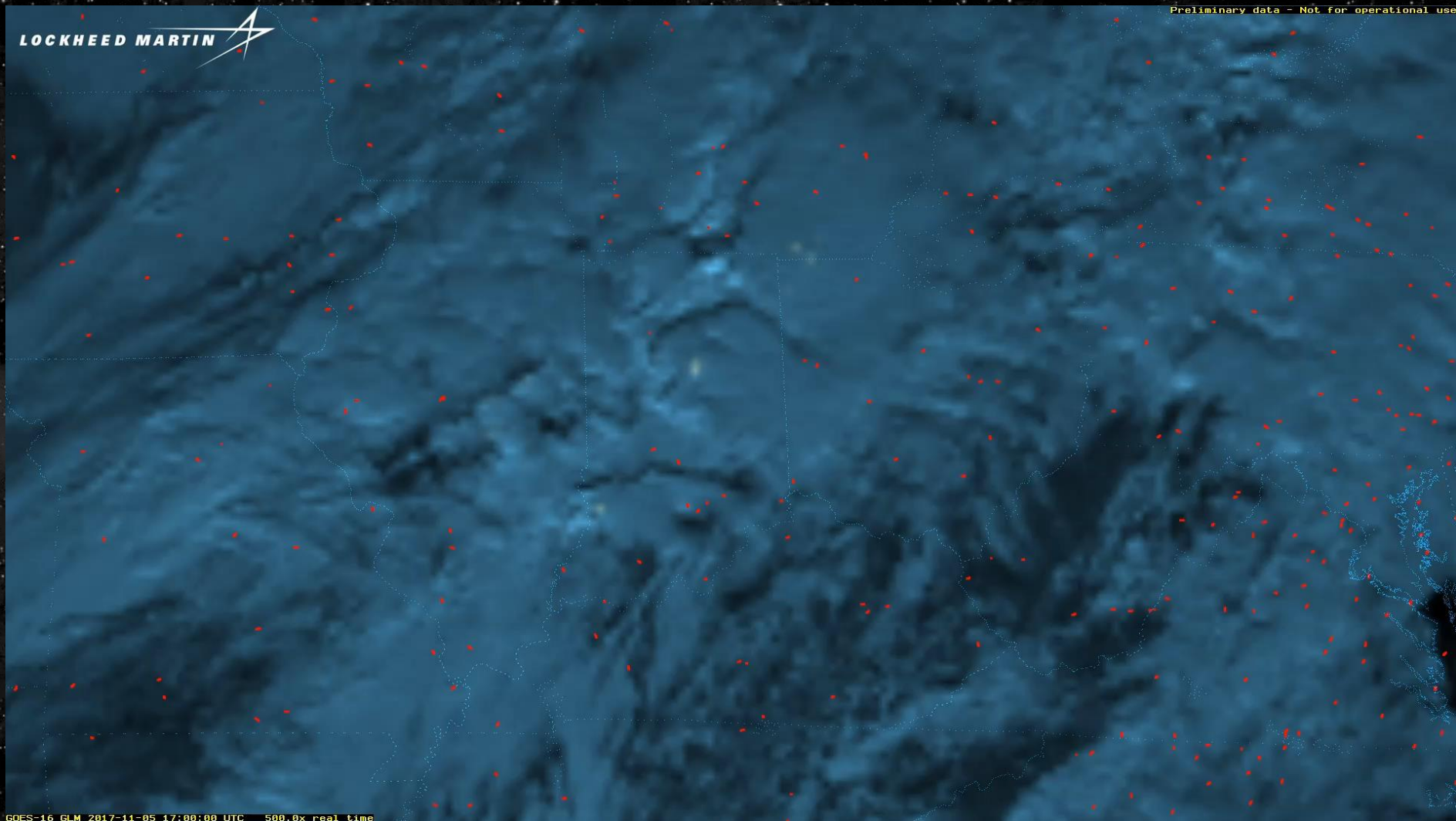
GOES-16 Highlights GLM and Air Traffic



November 5, 2017

Preliminary data - Not for operational use

LOCKHEED MARTIN



GOES-16 GLM 2017-11-05 17:00:00 UTC 500.0x real time



GOES-16 Highlights

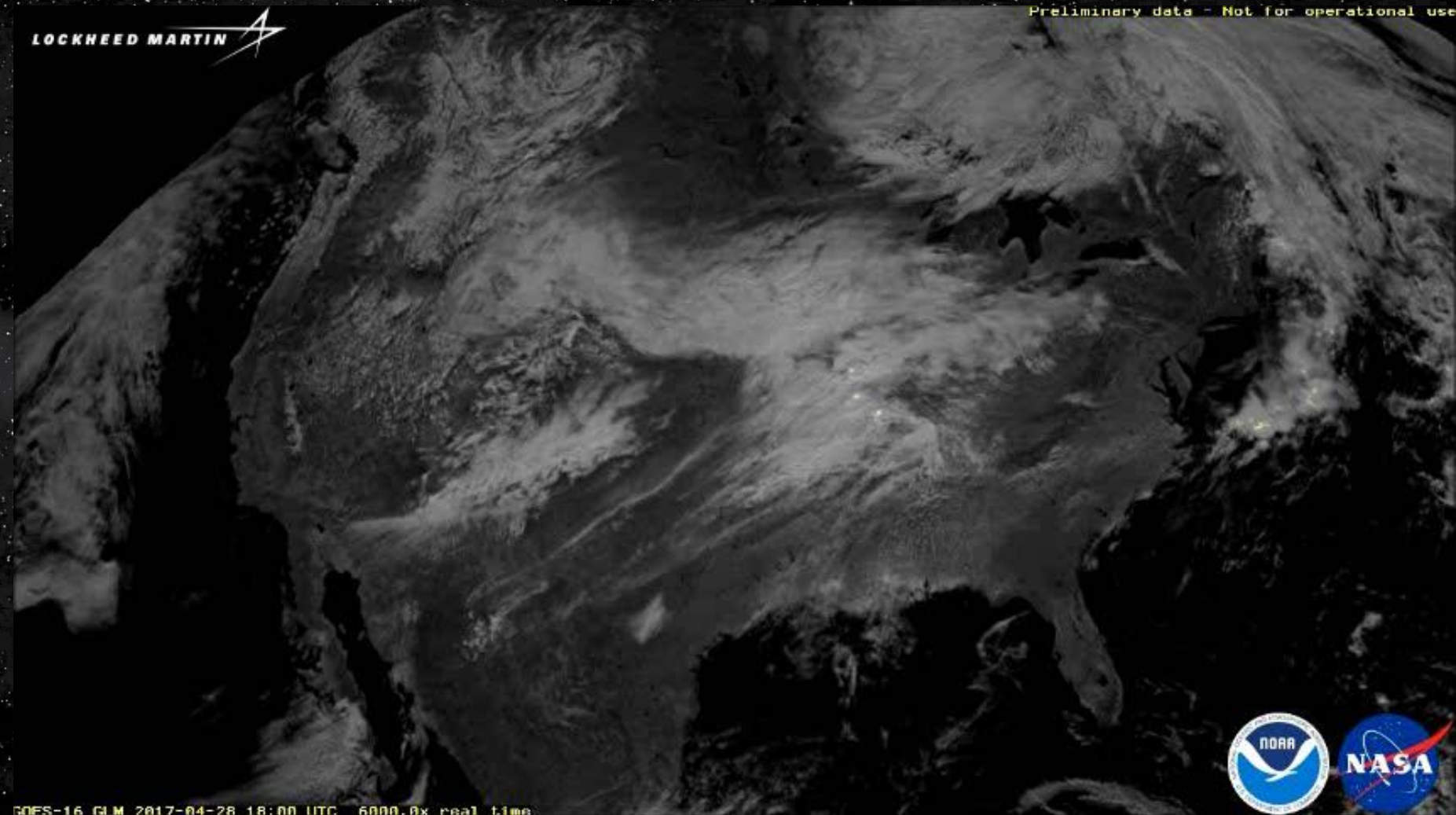
Lightning in Severe Storms



April 28-29, 2017

Preliminary data - Not for operational use

LOCKHEED MARTIN



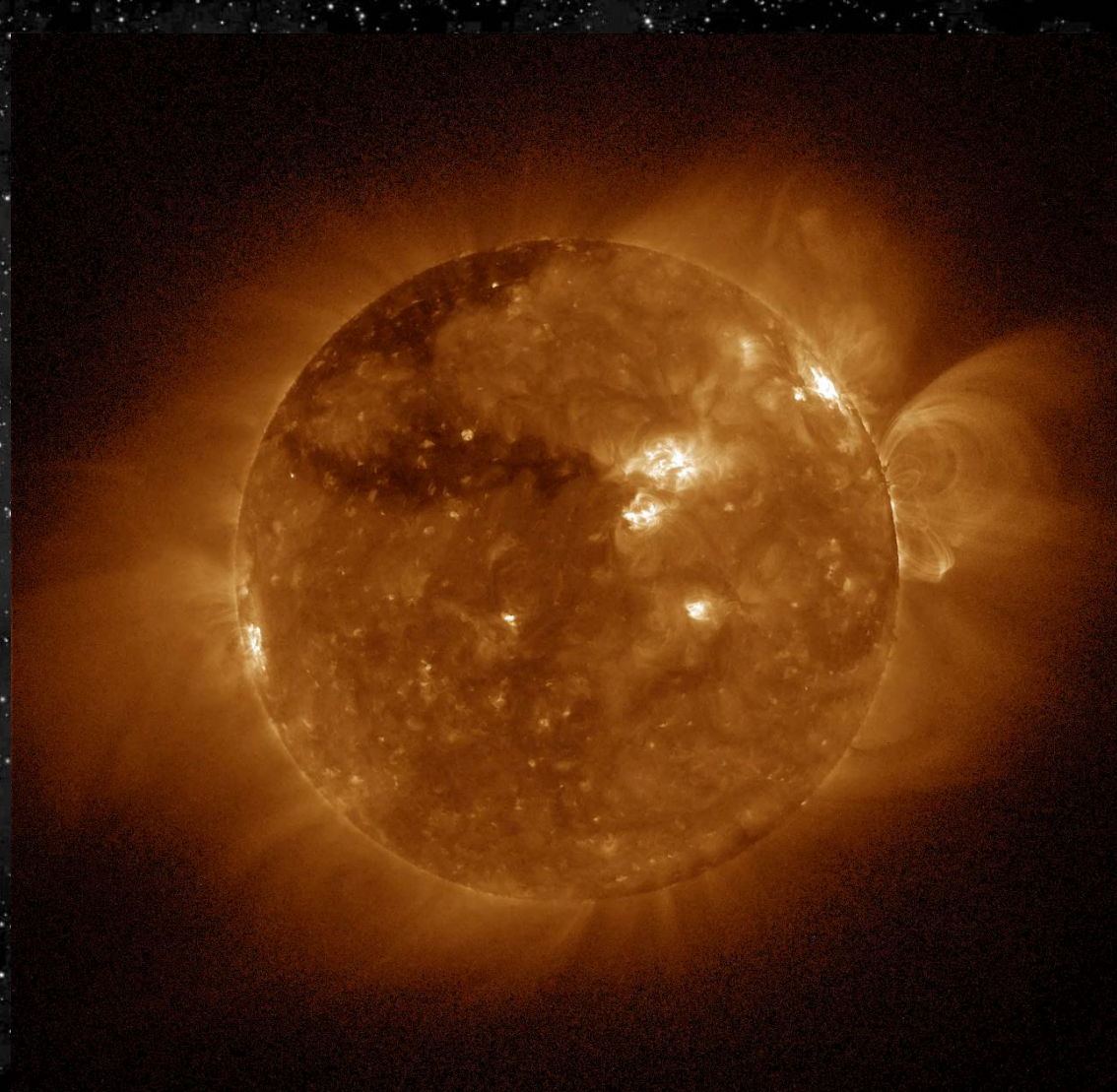
GOES-16 GLM 2017-04-28 18:00 UTC 6000.0x real time



GOES-16 Highlights

SUVI Sees Large Solar Flare

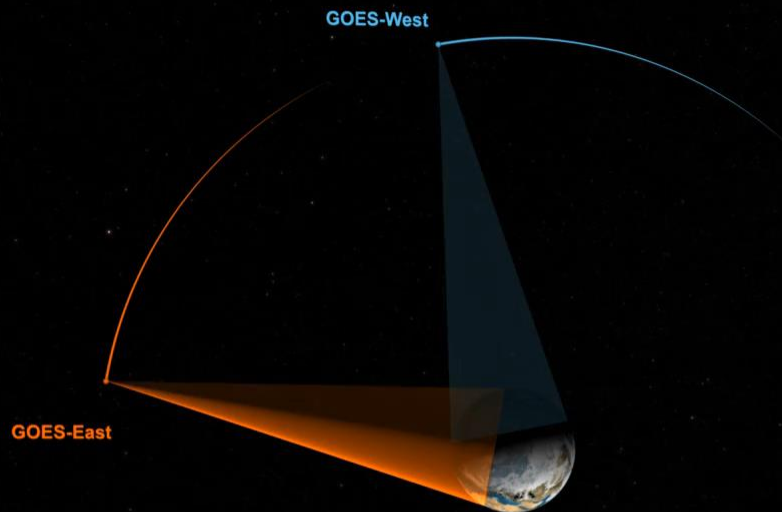
September 10, 2017



GOES-16/SUVI 195 Å 2017-09-10 15:01:14



GOES-East and GOES-West





GOES-17 Status



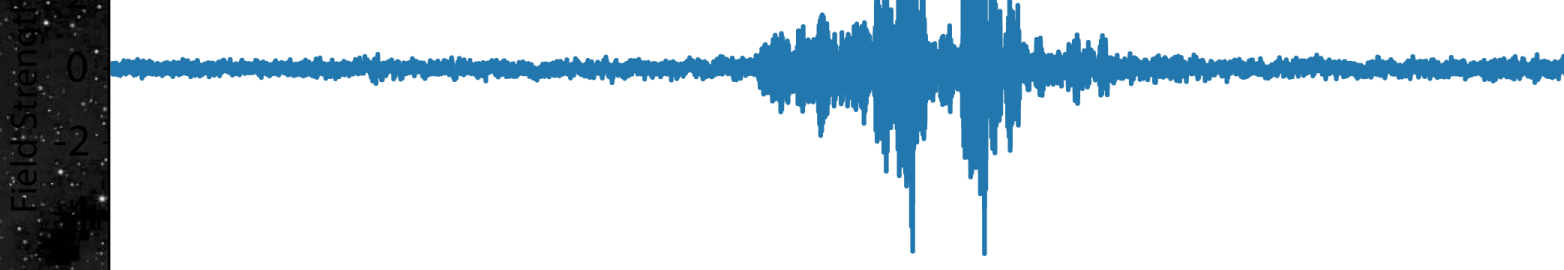
- Reached geostationary orbit on March 12, 2018 and renamed GOES-17
- Reached 89.5 degrees west longitude checkout location March 18
- Post-launch testing began March 26
- First public imagery from Advanced Baseline Imager expected in mid-May
- GOES-17 expected to be operational as NOAA's GOES West in late 2018



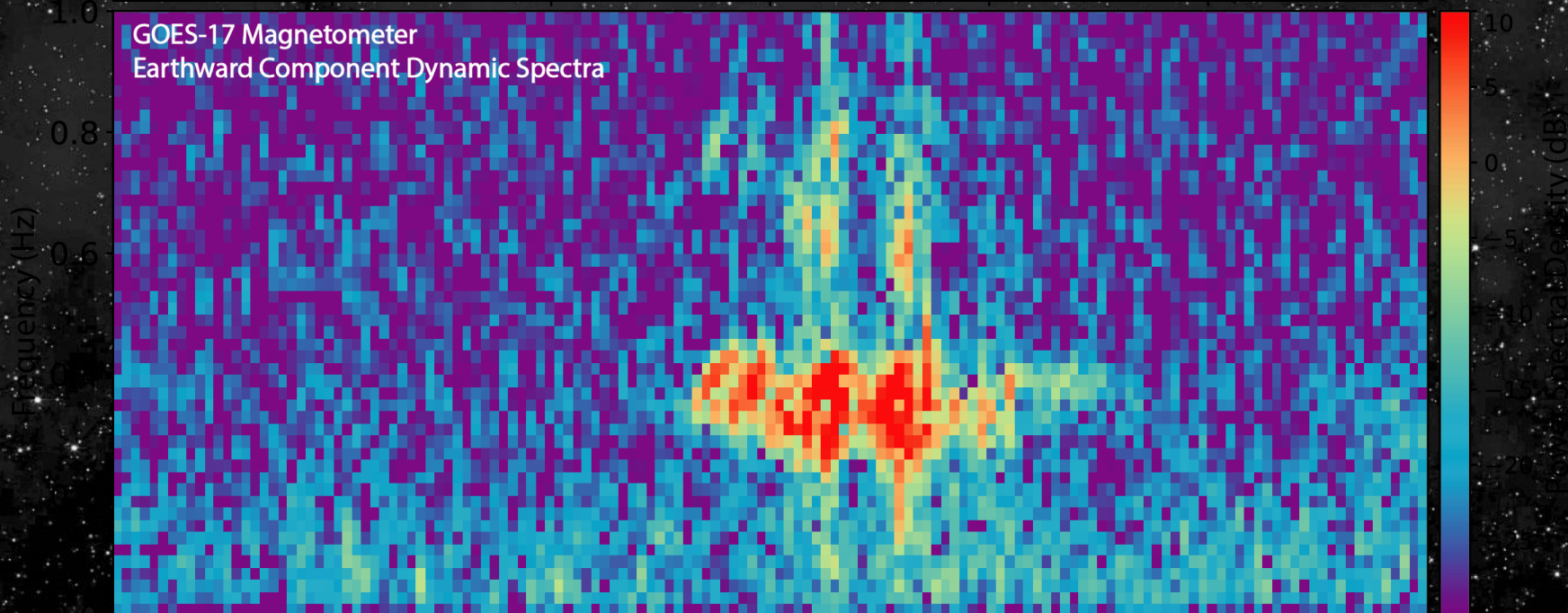


First Data from GOES-17 Magnetometer

GOES-17 Magnetometer
Earthward Component Timeseries



GOES-17 Magnetometer
Earthward Component Dynamic Spectra



19:50 20:00 20:10 20:20



GOES-T and GOES-U Status



- GOES-T:
 - System “mate” complete
 - Post-mate integration underway
 - Environmental testing to begin in mid-2018
 - Launched planned for 2020
- GOES-U:
 - All structure hardware shipped
 - Component deliveries continue
 - Launch planned for 2024





GOES-R

GEOSTATIONARY OPERATIONAL ENVIRONMENTAL SATELLITE R-SERIES

The **next**
generation of
geostationary
environmental
satellites

Thank you

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