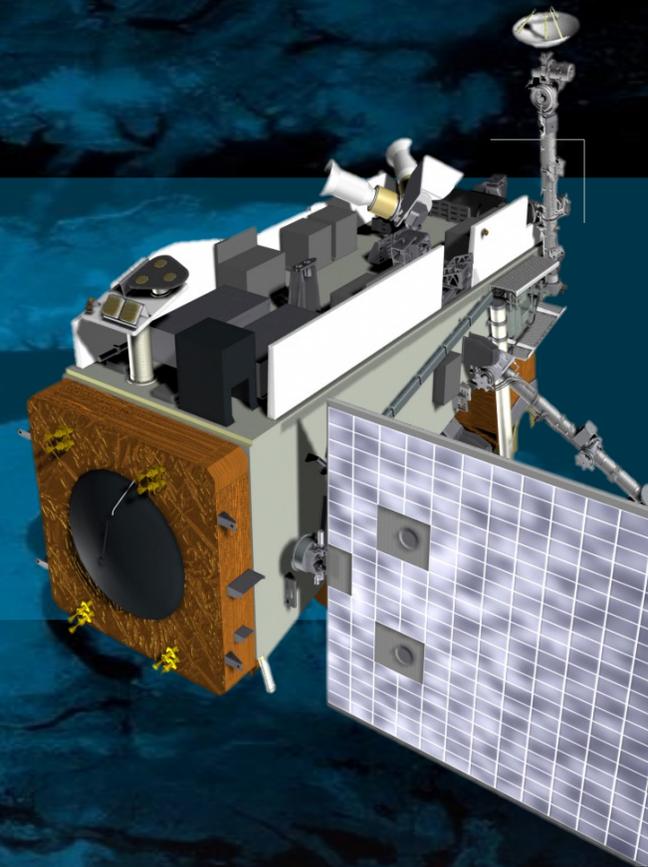


# The Joint Polar Satellite System

## JPSS-STAR Annual Meeting



**Greg Mandt**

JPSS Director & Program Manager

**GLOBAL DATA.  
LOCAL WEATHER.**



# NOAA Polar Orbiting Satellite History

## 1960

- Tiros-1 launch in April 1960. 48° inclination
- Nimbus-1 launch in Aug. 1964. First infrared sensor
- Tiros-9 launch in 1965. “Cartwheel configuration.” First polar orbit

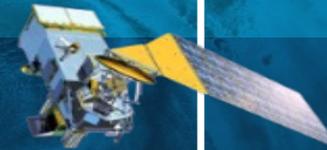


## 1980

- Tiros-N launch in October 1978. First AVHRR
- NOAA-8 launch in March 1983
- Physically larger and had more power than their predecessors

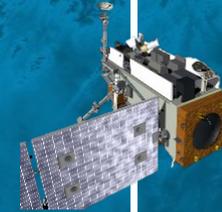
## 2000

- NOAA-15,16, 17. Heavier and more microwave channels
- NOAA-18, 19. Direct orbit insertion
- NPOESS/JPSS development
- NOAA + EUMETSAT IJPS agreement Nov. 19, 1998



## 2020

- JPSS series operational
- 22 channel imager
- Next-gen CrIS & ATMS
- Jason-2/3
- COSMIC-2 GNSS RO
- EON-MW

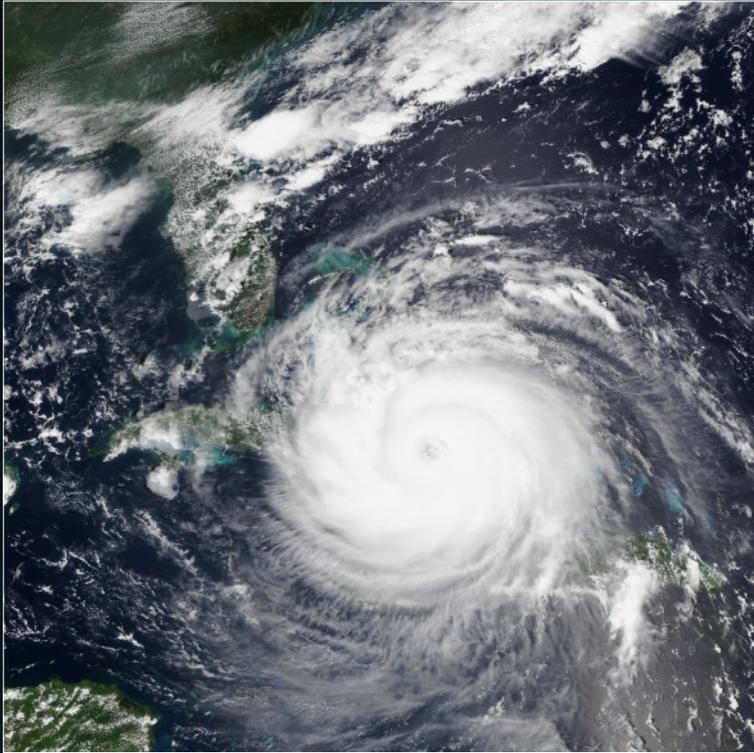


## 2040

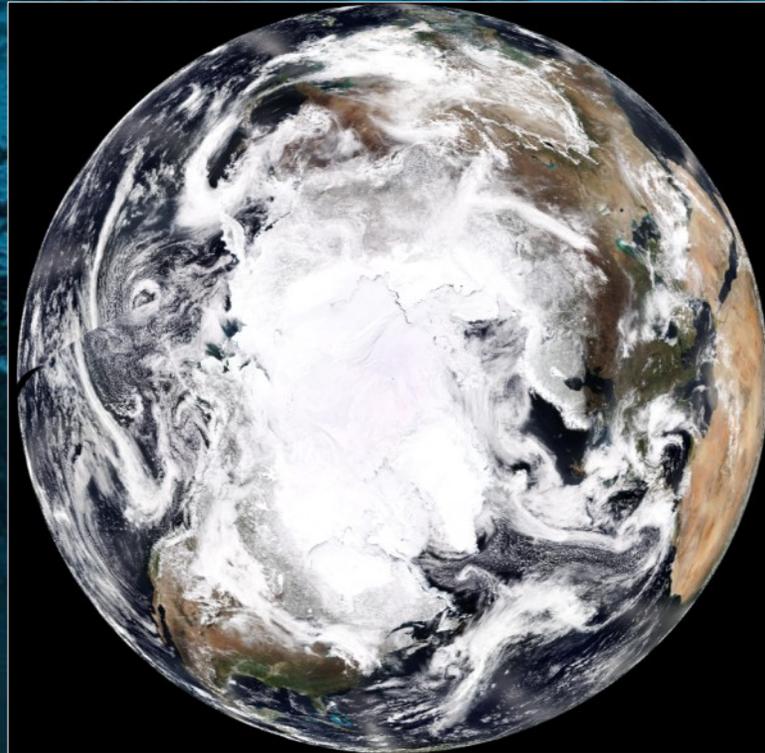




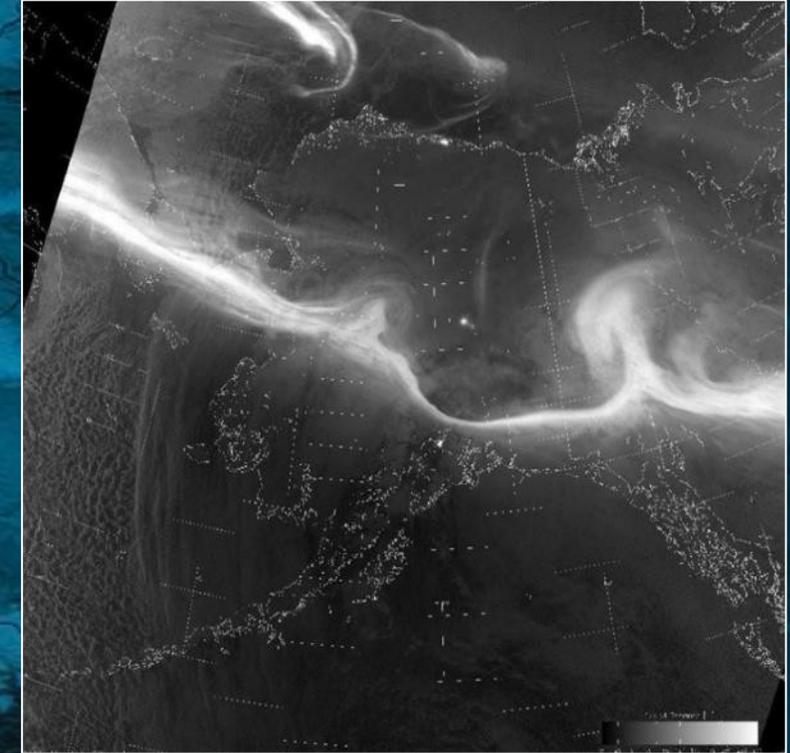
# The Joint Polar Satellite System Provides...



Critical data for numerical weather prediction to enable accurate 3–7 day forecasts.



Operational weather and environment satellite observations for Alaska and the polar regions.



Global coverage and unique day and night imaging capabilities to support environmental monitoring and forecasting.



# NOAA-20 is Now Operational!



Launched into Low Earth Orbit  
—512 miles

**14x**

Orbits Earth 14 times  
pole-to-pole with SNPP

**2x**

Images entire globe  
twice a day



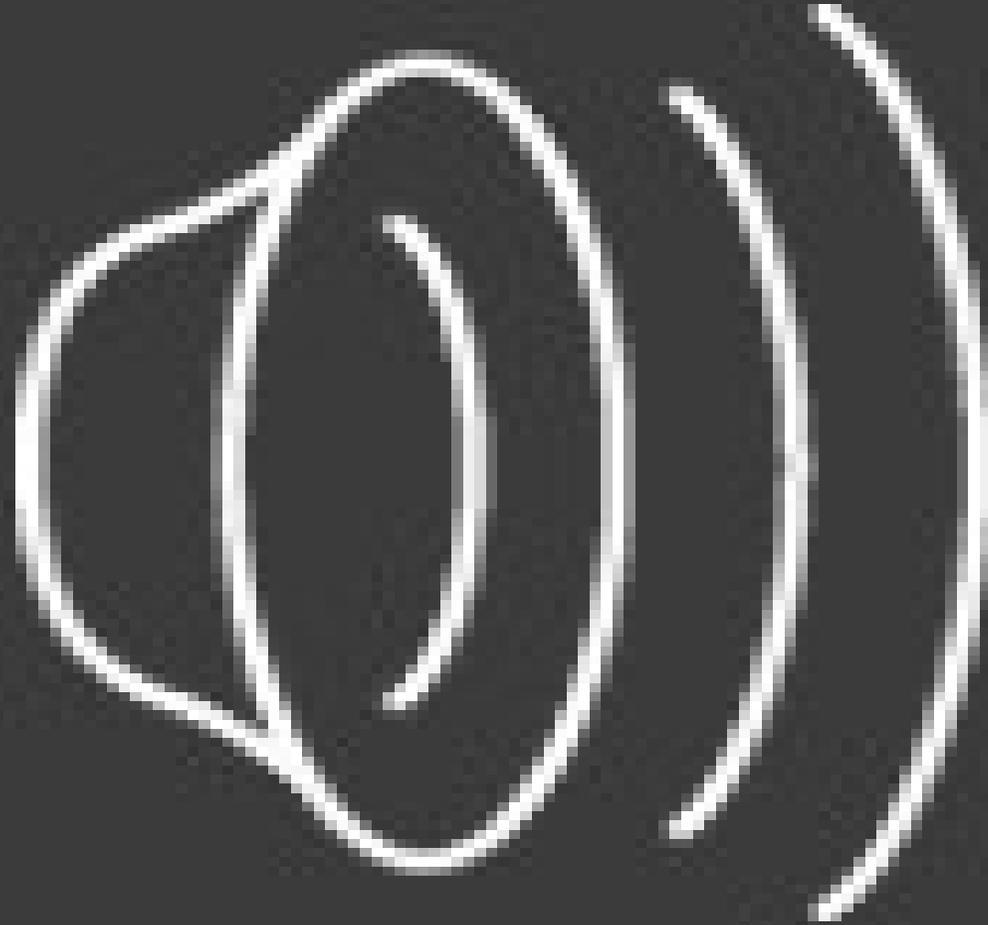
State of the art instrumentation  
to collect data on Earth's  
atmosphere, lands, and oceans



Sends more than 2,000  
gigabytes of data to  
Earth every day



Flys in the same orbit as  
Suomi NPP, 50 minutes apart





# International Collaboration for Global Forecasting

The international constellation of polar-orbiting satellites have been called the “backbone” of global weather forecasting.

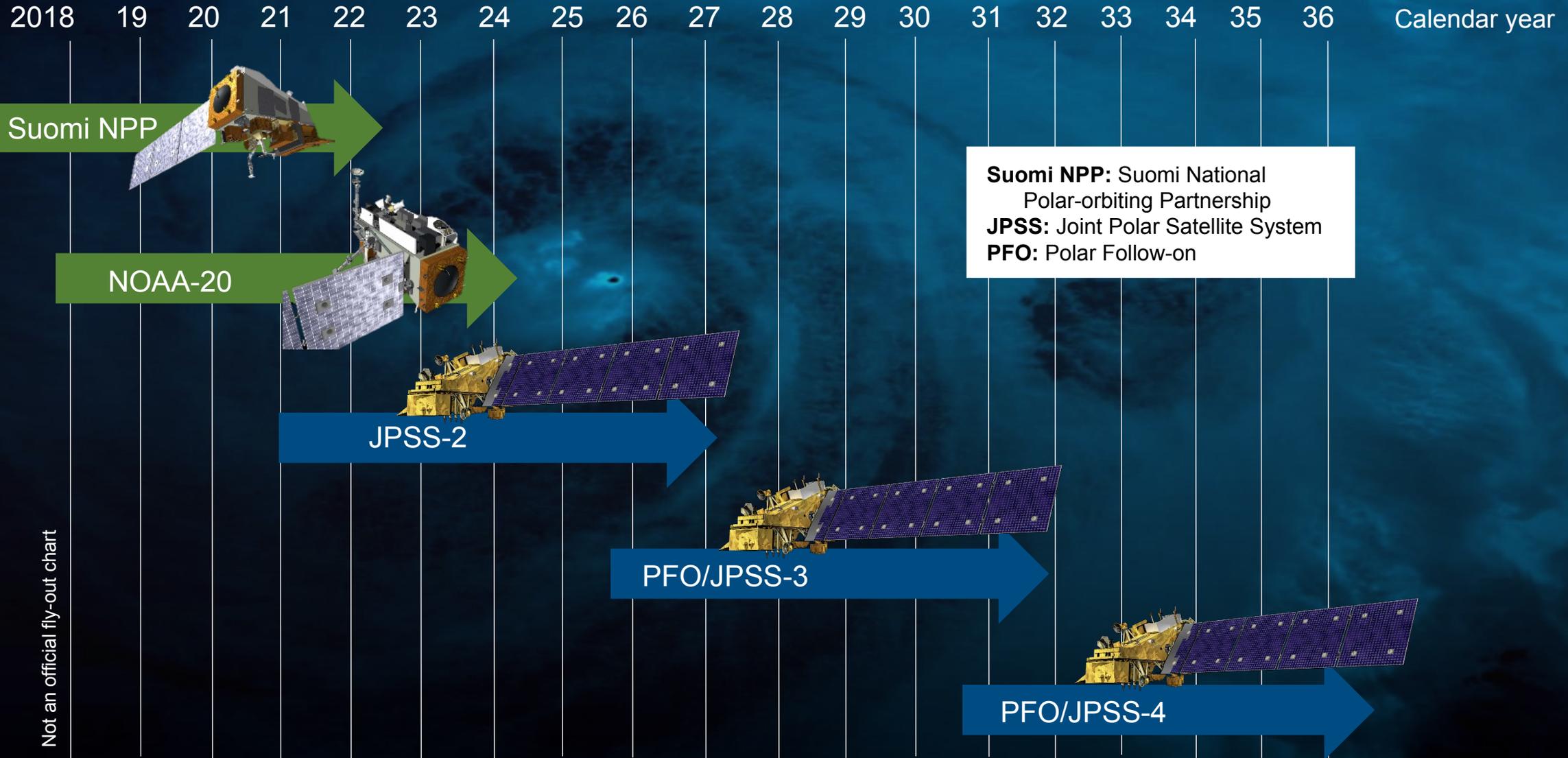


**85%**

Eighty-five percent of the data in global weather models comes from polar-orbiting satellites.



# JPSS Continuity of Operations

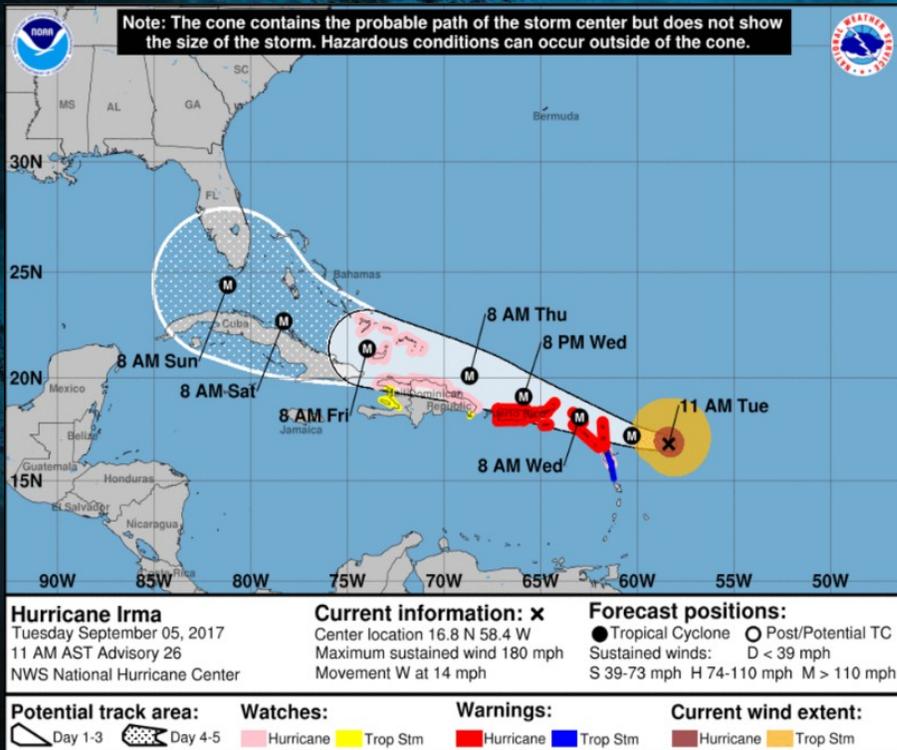




# Supporting NWS

▶ Suomi NPP remains healthy and continues to provide accurate atmospheric and environmental data.

🕒 NOAA-20 flies in the same orbit (50 minutes apart) collecting the same data as Suomi NPP.



Search LTE 11:37 AM 100%

**Louis Uccellini**  
1,006 Tweets

Tweets Tweets & replies Media Likes

7 78 39

**Louis Uccellini** @NWSDire... · 5/30/18  
 Great news! Observations from the new NOAA-20 are now feeding into our weather models in a record 6 months after launch; helping NWS forecasters provide more accurate 3-7 day forecasts and advance notice of major storms. News release: [noaa.gov/media-release/...](http://noaa.gov/media-release/) @NOAASatellites

8 163 426

Louis Uccellini Retweeted

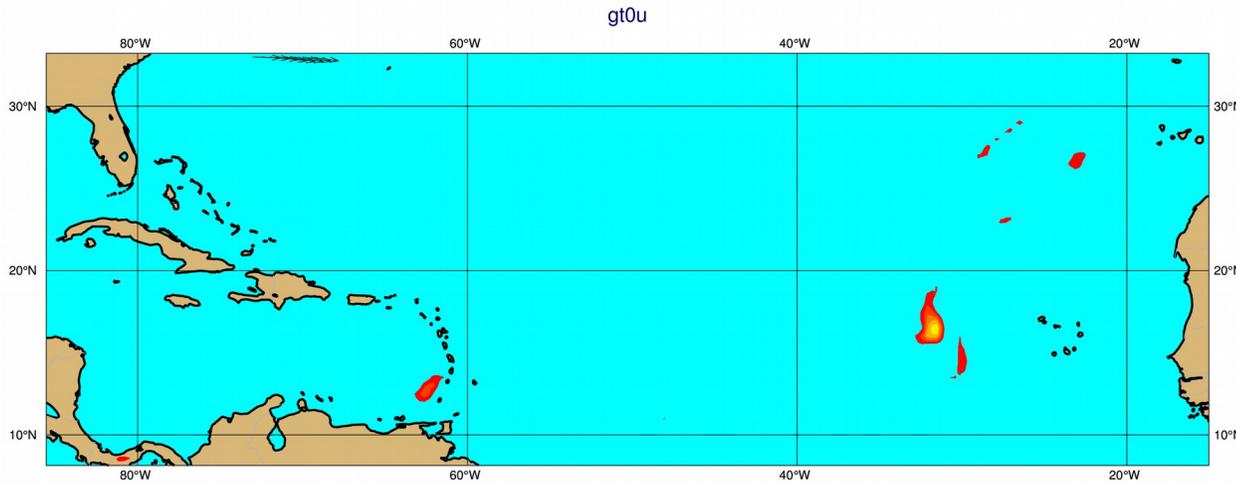
**NWS Elko** @NWSElko · 5/28/18  
 The upper level weather system that has been giving us multiple days of wet weather is slowly making its way east

🏠 🔍 🔔 20+ 📧 1

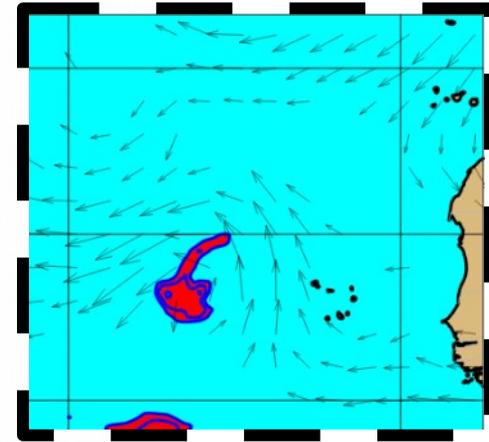


# Benefits to Users: Impact of Satellites on Forecasting of Irma

Forecast **WITH** Satellites

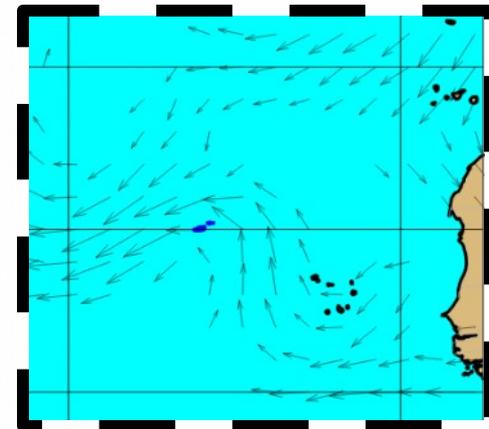
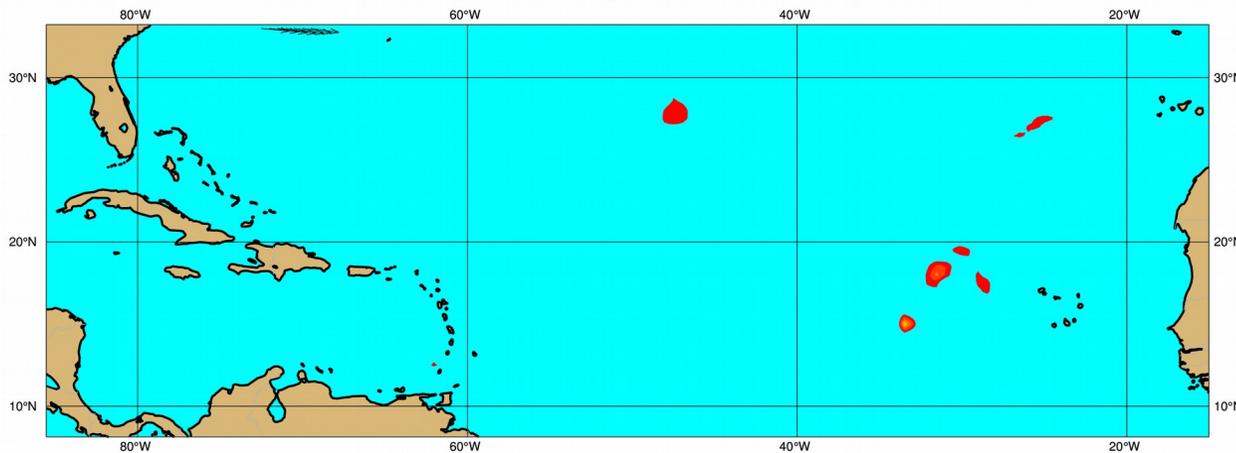


Thursday 31 August 2017 00 UTC ecmf 500 hPa Vorticity (relative)  
Thursday 31 August 2017 00 UTC ecmf 500 hPa U component of wind/V component of wind  
gt0v



700hPa initial conditions (humidity and wind) with satellites

Forecast **WITHOUT** Satellites



700hPa initial conditions (humidity and wind) without satellites



# **JPSS Connecting the dots**

**Flight systems development- instruments, satellite, launch**

**Ground system development - data collection and processing, distribution, archive**

**STAR science teams - algorithms, cal/val and software packages for operations**

**Algorithm Management - interface between STAR, Ground, Flight, and Operations**

**Proving Grounds - user engagement resulting in improvements in cross-NOAA products and services**

**Risk Reduction - use inspired new science and applications**



# STAR Cal/Val focused on the algorithms & product quality

**JSTAR Mapper**

Date: 08 01 2018

Layer 1  Show layer

Suomi NPP  VIIRS

Fire Radiative Power - Day

Layer opacity

Layer 2  Show layer

Suomi NPP  VIIRS

Fire Radiative Power - Day

Layer opacity

Layer 3  Show layer

Suomi NPP  VIIRS

Fire Radiative Power - Day

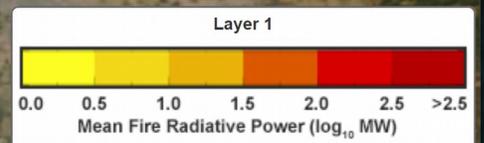
Layer opacity

Non-Product Layers

- SNPP VIIRS true color
- N20 VIIRS true color
- VIIRS data granules



08-01-2018: 40.09° -123.01°

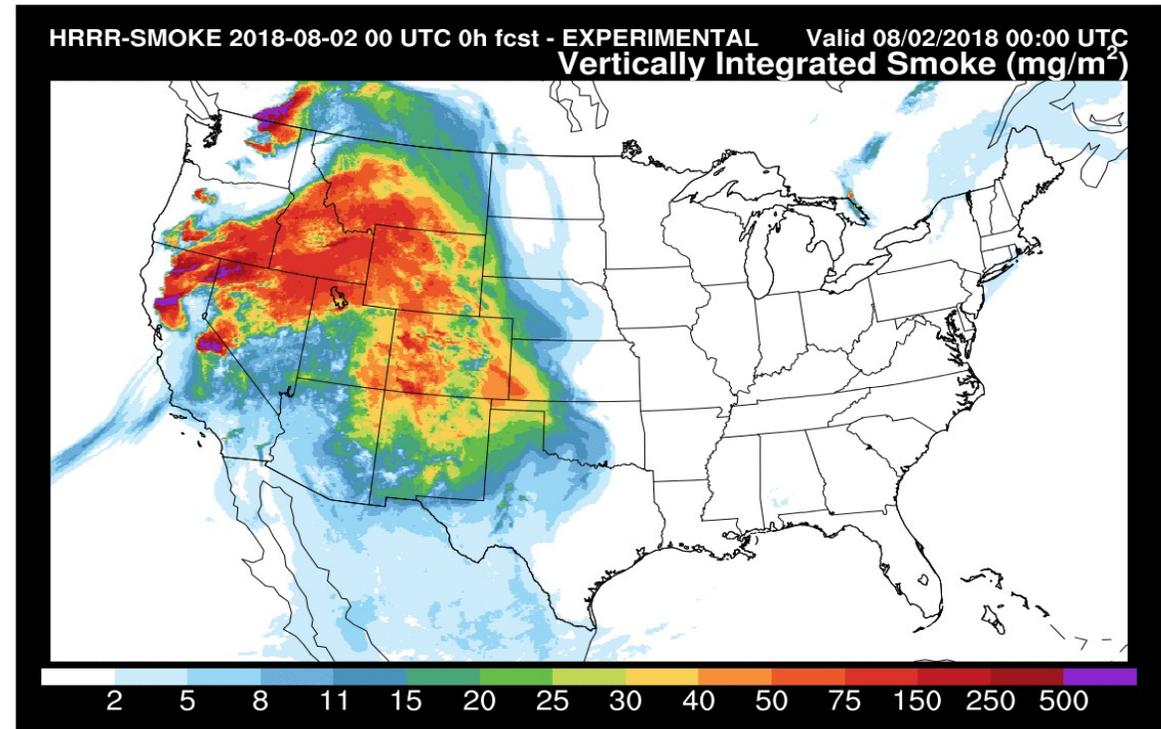




# Proving Ground focused on the Applications

“I’ve been at California State Emergency Services and the smoke model data was **VITAL** and still is for our Department of Transportation partners dealing with AMTRAK running through northern and central California. I’ve met these DOT folks in person and they would like to say thank you too!”

Khristian Mattarochia  
National Weather Service  
Science & Operations Office  
Hanford, CA (August 1, 6:23 PM)



## Cooperative Institutes

### Alaska

- Cooperative Institute for Alaska Research—University of Alaska

### California

- Cooperative Institute for Marine Ecosystems and Climate—UC San Diego

### Colorado

- Cooperative Institute for Research in the Atmosphere—Colorado State University
- Cooperative Institute for Research in Environmental Sciences—University of Colorado

### Maryland

- Cooperative Institute for Climate & Satellites—University of Maryland

### Mississippi

- Northern Gulf Institute (NGI)—Stennis Space Center

### Wisconsin

- Cooperative Institute for Meteorological Satellite Studies—University of Wisconsin-Madison

## Government Agencies

### Alabama

- NASA Marshall Space Flight Center

### Alaska

- Bureau of Land Management, Alaska Fire Service

### California

- Naval Research Lab
- NASA Jet Propulsion Lab
- National Marine Fisheries Service

### Colorado

- NOAA OAR Earth System Research Laboratory

### Florida

- NASA Kennedy Space Center

### Maryland

- NESDIS, National Weather Service, National Ocean Service

## University Partners

### Alaska

- Geographic Information Network of Alaska (GINA)

### Colorado

- University Corporation for Atmospheric Research

### Hawaii

- University of Hawaii

### New York

- The City College of New York

### Massachusetts

- MIT

## Prime Contractors

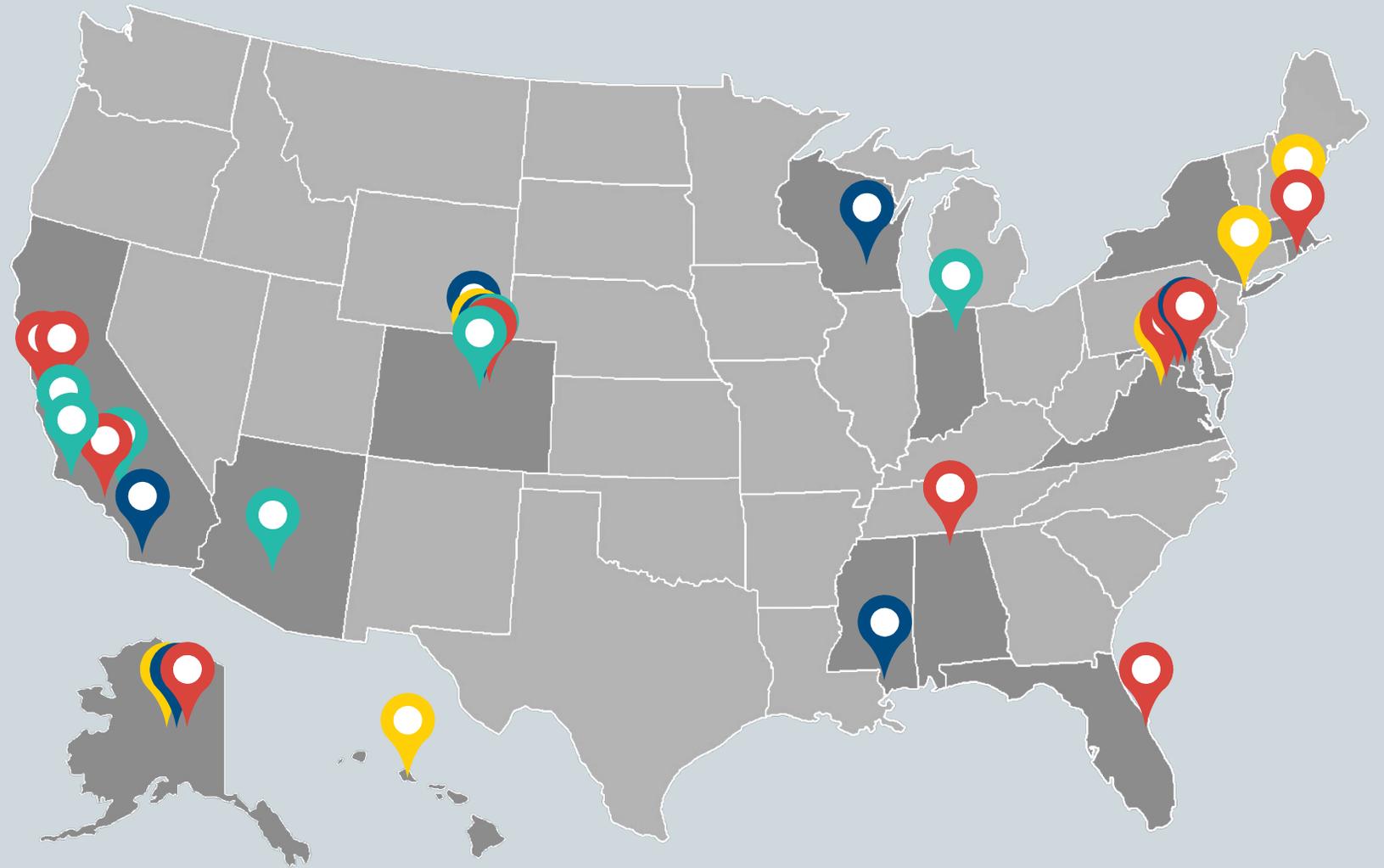
### Arizona

- Orbital ATK

### California

- Northrop Grumman
- Raytheon Space and Airborne Systems
- United Launch Services

### Colorado



# JPSS

U.S. Partners



# THANK YOU!

For more information visit: [www.jpss.noaa.gov](http://www.jpss.noaa.gov)

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