COORDINATION GROUP FOR METEOROLOGICAL SATELLITES

AND GOFC-GOLD

Mitch Goldberg, CGMS co-liaison to CGMS

Working group 2 – satellite data and products

October 1, 2018

Background

- CEOS initiated a study of Non-Meteorological Applications from Geostationary Satellites.
- The report also includes a section (chapter 4) which emphasizes the importance of GEO and LEO synergy
- CGMS Working Group 2 reinforced the importance to integrate GEO into existing LEO NMA activities
- CGMS has an action to consider pilot projects related to fire, aerosols, and flood mapping
- For fire and aerosols we are invited the chairs of AEROSAT and GOFC-Gold to provide a status on their activities and to see if CGMS can use these existing mechanisms
- With respect to flood mapping there is an action for NOAA and CMA to propose a pilot project.

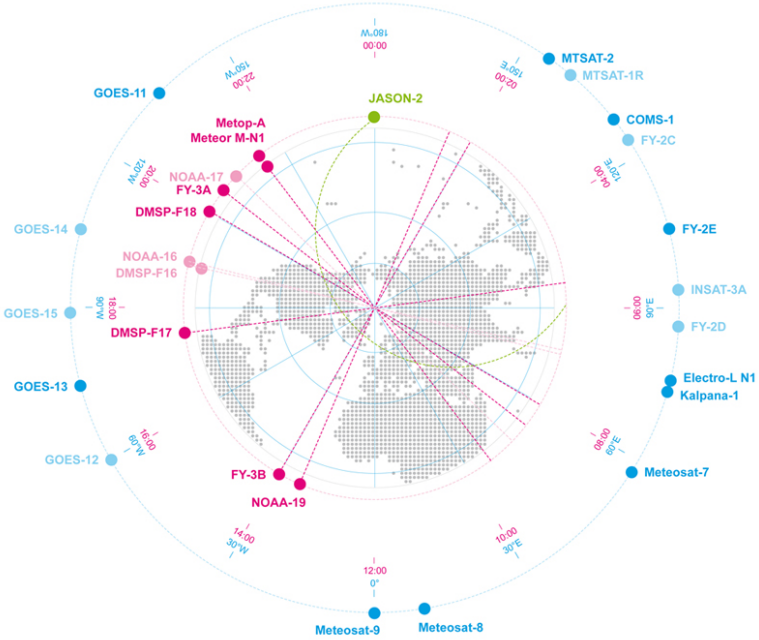
Coordination Group for Meteorological Satellites - CGMS

CGMS:

The Coordination on Geostationary Meteorological Satellites was initially created in 1972 to consider common interests relating to the design, operation and use of planned meteorological satellites.

The name was later changed to the Coordination Group for Meteorological Satellites to include low-Earth orbit satellites and the activities are governed by a Charter.

The CGMS meets in plenary session on an annual basis following meetings of four Working Groups on telecommunication, satellite data and products, operational continuity and contingency planning, and global data dissemination respectively.



Members:

Members are those organisations and space agencies that are current and prospective developers and operators of meteorological satellites ; Space agencies operating R&D satellites contributing to WMO programmes; WMO, because of its unique role as representative of the world meteorological data user community.

Current members:
CMA, CNES, CNSA, ESA, EUMETSAT (CGMS Secretariat since 1987), IMD, IOC/UNESCO, ISROJAXA, JMA, KMA, NASA, NOAA, ROSCOSMOS, ROSHYDROMET, and WMO

The objectives of CGMS are formalised within its Charter:

- To provide an international forum for the exchange of technical information on geostationary and polar-orbiting meteorological satellite systems and research & development missions, such as reporting on current meteorological satellite status and future plans, telecommunications matters, operations, intercalibration of sensors, processing algorithms, products and their validation, data transmission formats and future data transmission standards.

- To harmonise meteorological satellite mission parameters (such as orbits, sensors, data formats and downlink frequencies) to the greatest extent possible.

- To encourage complementarity, compatibility and possible mutual back-up in the event of system failure through cooperative mission planning, compatible meteorological data products and services and the coordination of space and data-related activities, thus complementing the work of other international satellite coordinating mechanisms.

Working groups

Working Group I: Satellite systems and operations	read more
Working Group II: Satellite data and products	read more
Working Group III: Operational continuity and contingency planning	read more
Working Group IV: Support for end users	read more
SWCG: Space weather coordination group	read more

In addition, there are a few International Science Working Groups interacting with CGMS: The International TOVS Working Group - ITWG; the International Precipitation Working Group - IPWG; the International Winds Working Group - IWWG; the International Radio Occultation Working Group - IROWG and the International Clouds Working Group (ICWG). The last four Working Groups originate from CGMS WG II and plenary sessions.

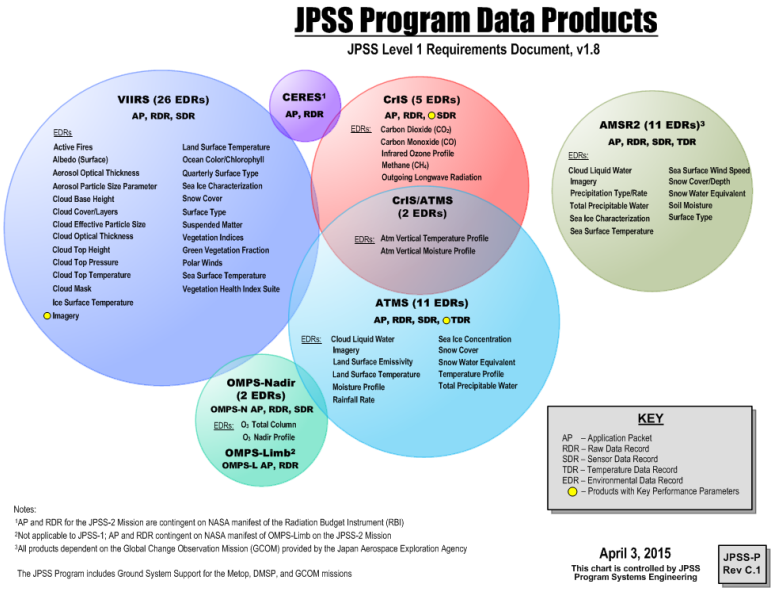
International science working groups

International TOVS Working Group: ITWG	read more
International Precipitation Working Group: IPWG	read more
International Radio Occultation Working Group: IROWG	read more
International Winds Working Group: IWWG	read more
International Clouds Working Group: ICWG	read more

CGMS focus

- Capacity building - agencies operating satellites should become experts for their satellite products and engage with their user communities
- Primary emphasis: Operational dissemination for operational users
  - Research is a critical pathway
  - Research agencies provision of advanced data

Satellite Proving Ground: Goal is to improve NOAA Services through optimizing the use of satellite data along with other sources of data & information: Observations to Services to Stakeholders



Addressing needs across NOAA

Air Quality

Office of Science and Technology Integration
National Program

Page Navigation
- STI Home
- STI Modeling Program Home

Air Quality
- Air Quality Home
- NAQFC Operational Predictions
- FAQs
- Publications
- Archives
- AQ Forecast Guidance
- AQ Webservices

Related Sites
- EPA AIRNow
- Air Quality Awareness Week
- Air Quality Safety Page
- Air Quality Factsheet
- National Weather Service Forecasts
- National Centers for Environmental Prediction
- Air Resources Laboratory
- Telecommunication Operations Center
- NESDIS Satellite Based Fires and Smoke

Contact

National Air Quality Forecast Capability (NAQFC)

Overview

NAQFC develops and implements operational air quality forecast guidance for the United States. Current operational predictions include ozone, smoke, dust and fine particulate matter (PM2.5) at the surface in the air we breathe.

Vision

National Air Quality Forecast System which provides the U.S. with ozone, particulate matter and other pollutant forecasts with enough accuracy and advance notice to take action to prevent or reduce adverse effects.

Strategy

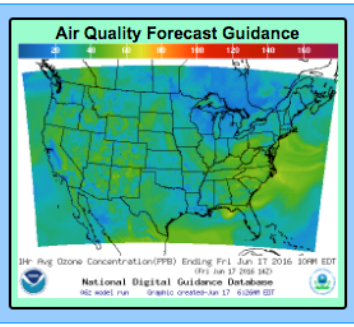
Work with EPA, State and Local Air Quality agencies and private sector to develop end-to-end air quality forecast capability for the Nation.

Background

- Operational Predictions of Air Quality for the United States [pdf]
- Background on the Air Quality Forecast Capability
- Summary of the Air Quality Forecast Capability
- Air Quality FAQs

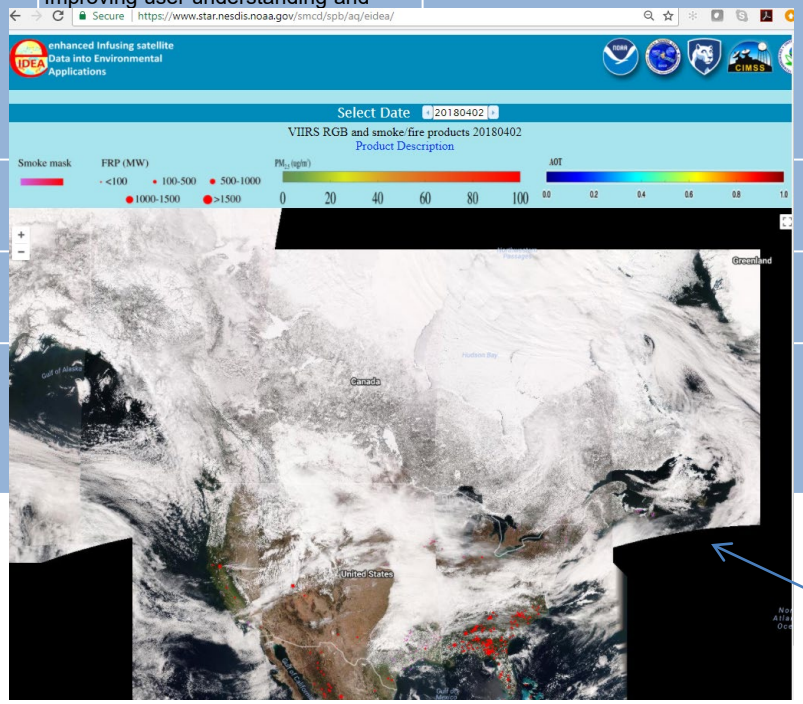
Nationwide Operational Air Quality Forecast Guidance:

Forecast Guidance for Ozone and Smoke Nationwide and for Dust over Contiguous 48 States (CONUS)

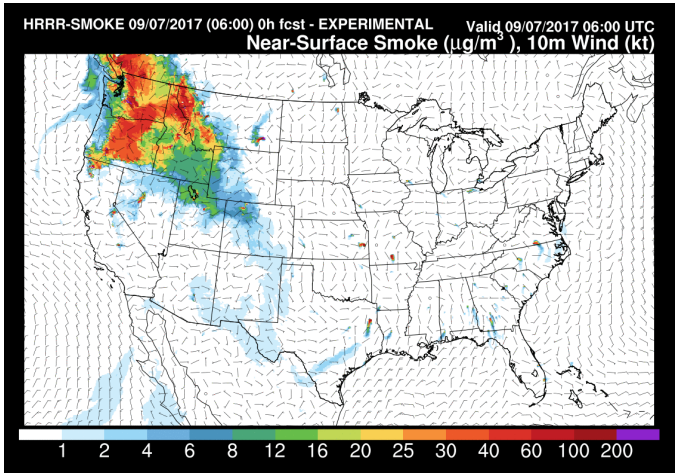


Fire & Smoke

Funded Projects		
Principal Investigator	**Title**	**Institution**
Ahmadov, Ravan, Shoba Kondragunta, Ivan Csiszar	Rapidly updated high-resolution predictions of smoke, visibility and smoke-weather interactions using the VIIRS fire products within the Rapid Refresh and High-Resolution Rapid Refresh coupled with Smoke (RAP/HRRR-Smoke) modeling system	OAR/ESRL/CIRES, STAR
Batzil, Sam	Web-based Tool for Rapid Burn Intensity Estimates Using VIIRS NDVI	UW/CIMSS
Ellicott, Evan	Improving user understanding and	
Elvidge, Christopher		
Frost, Greg		
Kondragunta, Shobha		



Improving use of satellite fire and aerosol products for fire spread, air quality, visibility warnings and forecasts



JPSS PGRR funded OAR HRRR smoke model enhancements and will be transitioned to NCEP operations

Provide training to USFS and IMETS

Enhanced websites to display fire location, fire radiative power, aerosol optical thickness - Enhanced IDEA

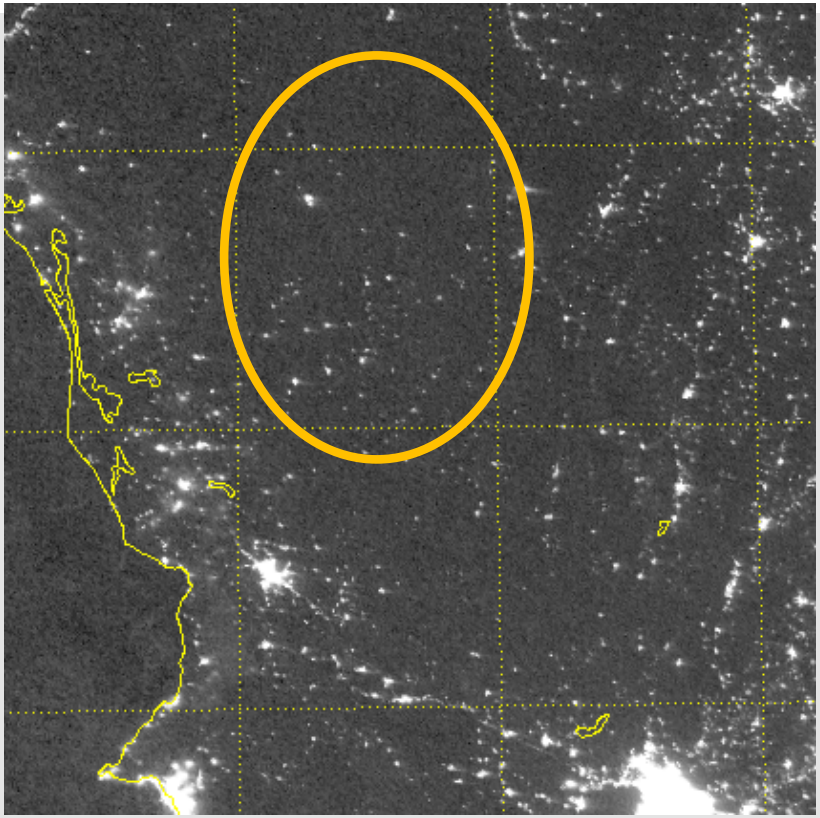
Advantages of Polar and GEO for Fire Detection

- Both GOES-16 (and GOES-17) as well as VIIRS on SNPP and NOAA-20 have similar channels for fire detection
- Polar imagers has higher spatial resolution than geostationary satellites, allowing for finer fire edge detection
- VIIRS has a “Day Night Band” allowing for “visible at night” imagery. This allows for smoke detection when moonlight is available.
- Geostationary satellites, in particular ABI on GOES-16/17 have a higher temporal resolution, allowing for early detection of fires (ex. Tubbs fire) as well as continuous monitoring.
- The combination of next generation geostationary satellite allow for consistent global monitoring on a high temporal scale.

Use of Day Night Band to detect small fires

08:43 UTC
23 May 2017

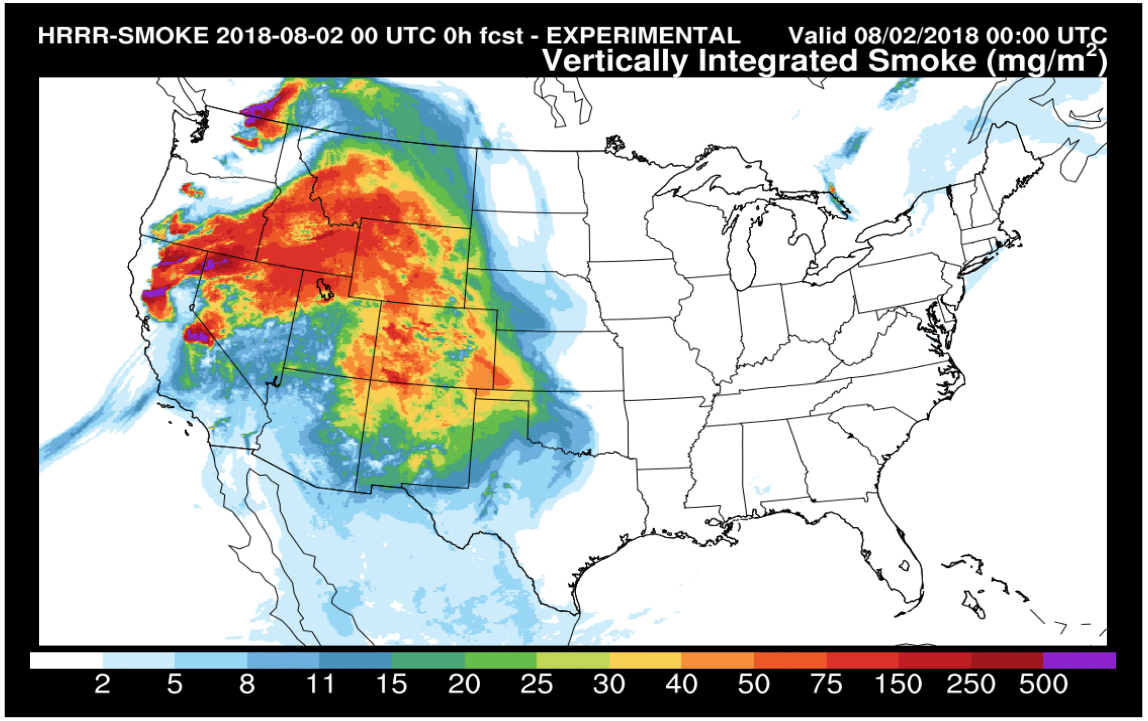
- *VIIRS 4.0 µm fire detection band (M-13) shows small fires in the Sierra Madre Occidental (Durango, Mexico).*
- *The Day/Night Band better highlights these fires at night, improving fire detection.*
- *VIIRS Day/Night Band image from 08:10 UTC 28 April 2017*



VIIRS FRP are ingested into smoke forecast models

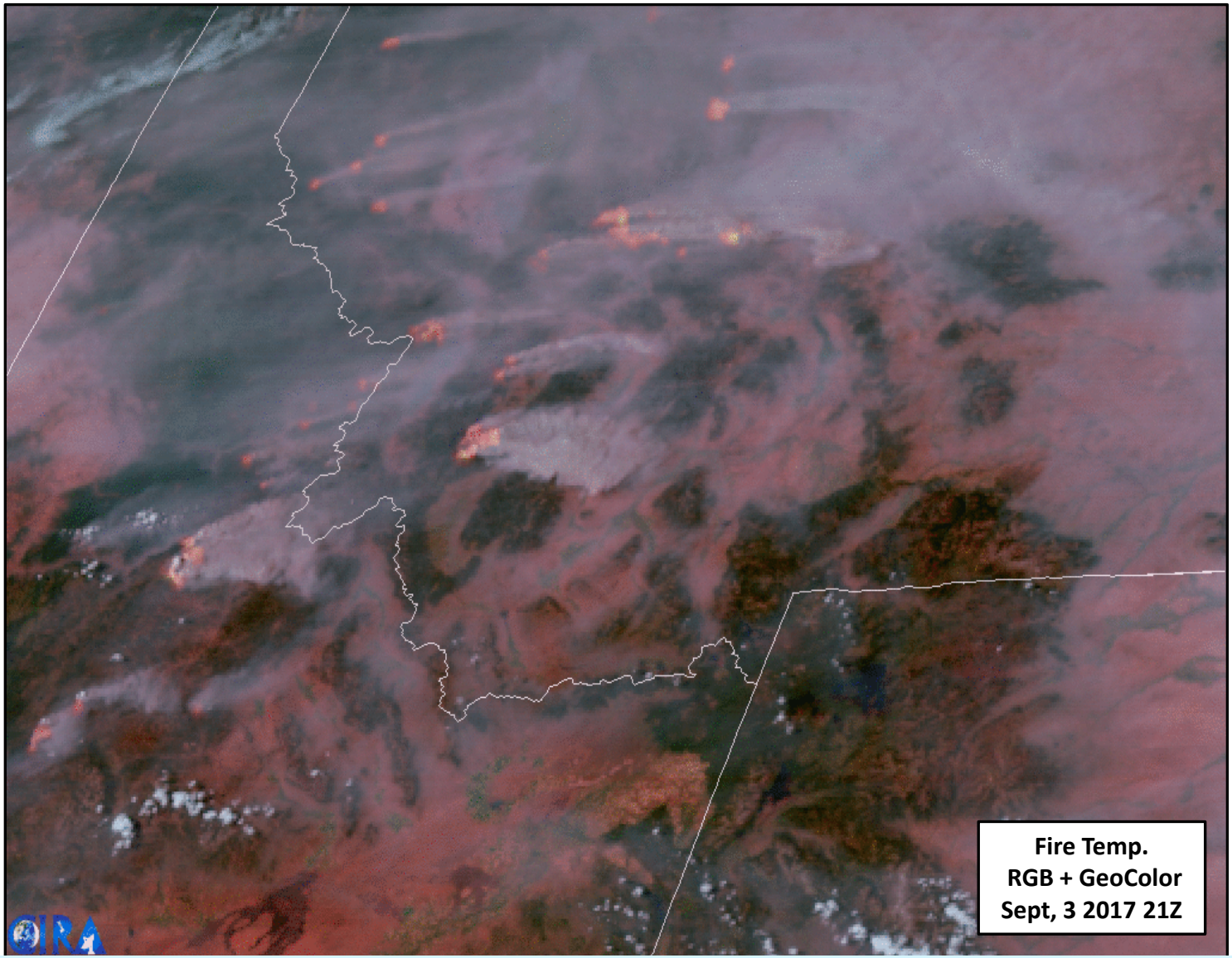
"I've been at California State Emergency Services and the smoke model data was VITAL and still is for our Department of Transportation partners dealing with AMTRAK running through northern and central California. I've met these DOT folks in person and they would like to say thank you too!"

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

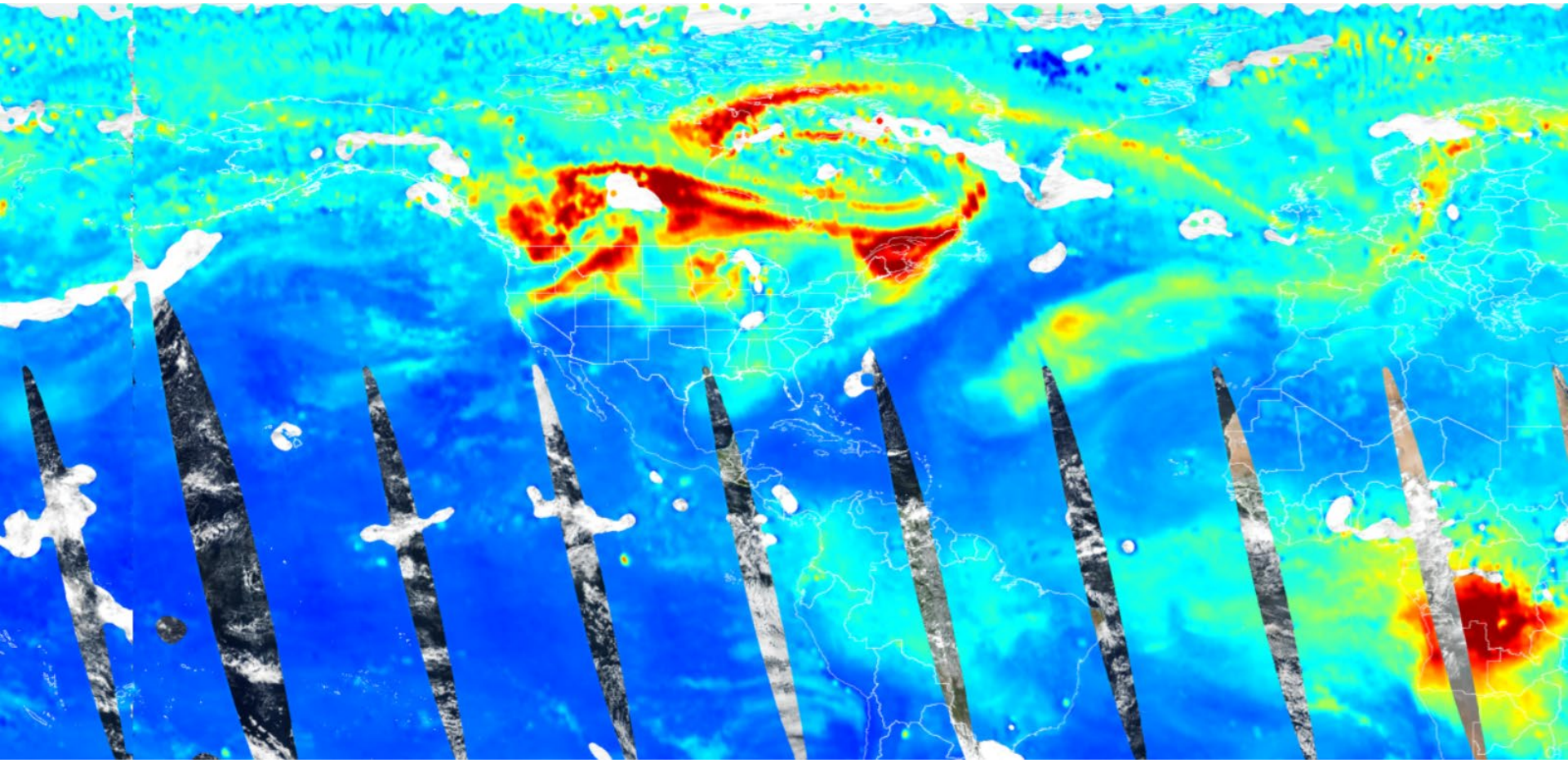


GOES EAST

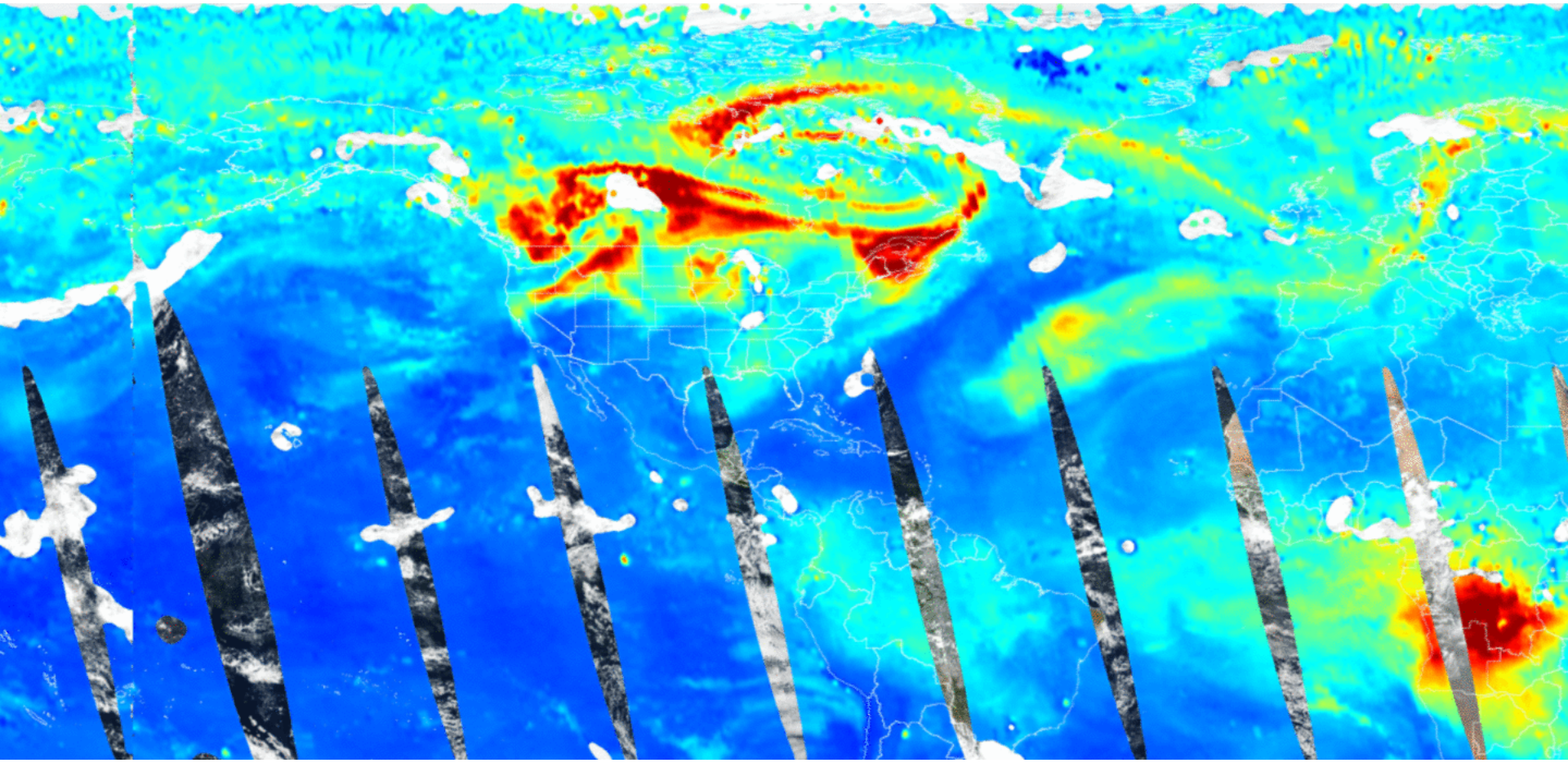
Weather & Fire Applications



VIIRS and CrIS monitoring aerosols and CO (500 hPa) August 24, 2018



500 hPa CO (August 24 – 30, 2018)



Recommendation

- Include CGMS operational agencies with new advanced LEOs and GEOs.
- Develop best practices and guidelines for operational dissemination and applications.
  - Application development is very important (fire spread, smoke forecasts).
- Think about the fire and smoke scenario and how to use the constellation for decision support.
- Reports to CGMS annual meeting.