

National Environmental Satellite, Data,
and Information Service

June 21, 2022

The Role of ~~Direct Broadcast~~ for Low Latency Applications

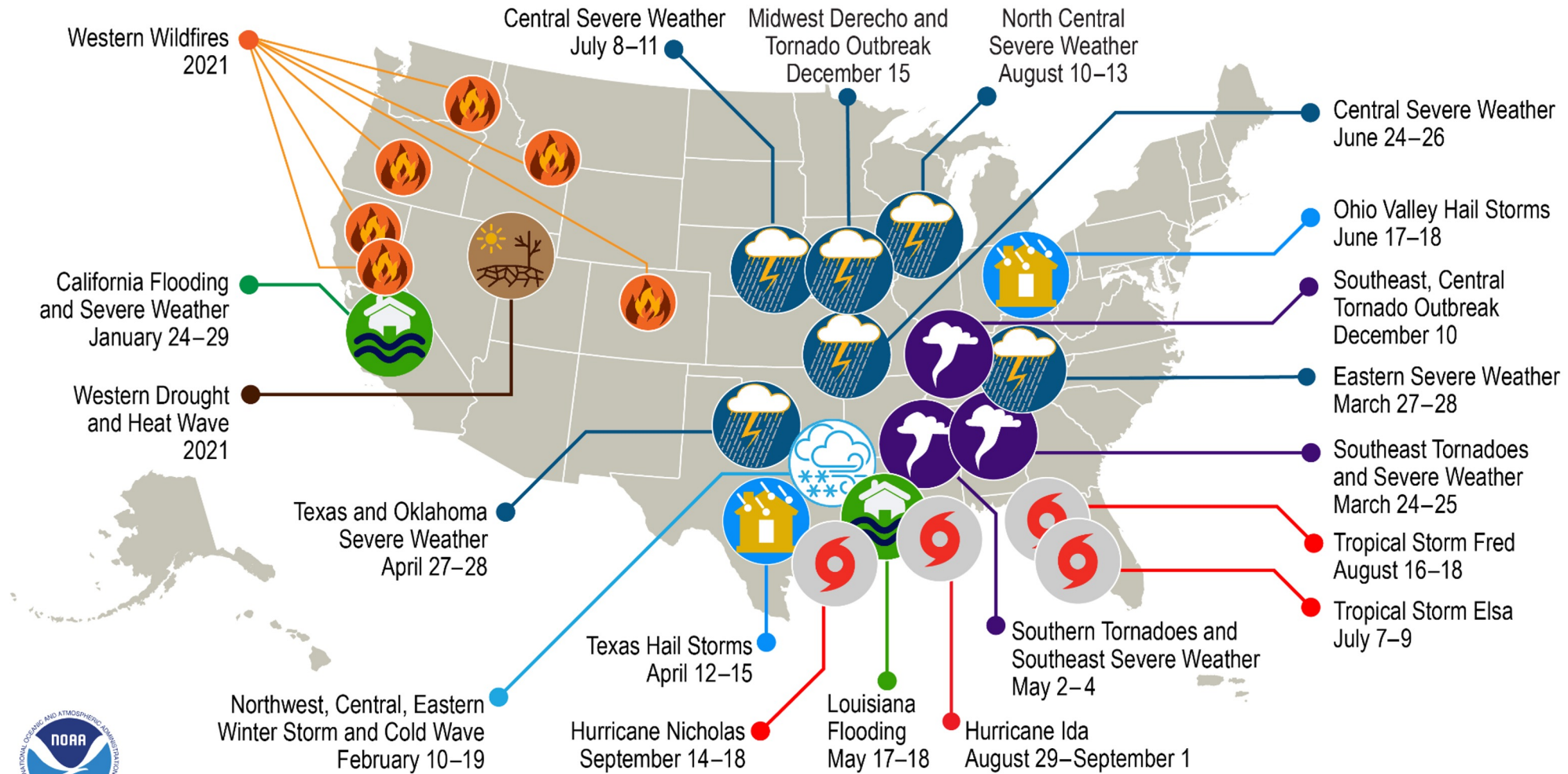
The Role of CSPP for Critical Applications

2022 CSPP Users' Group Meeting

Dr. Mitch Goldberg, Chief Scientist

2021 Billion-Dollar Disasters

U.S. 2021 Billion-Dollar Weather and Climate Disasters



This map denotes the approximate location for each of the 20 separate billion-dollar weather and climate disasters that impacted the United States in 2021

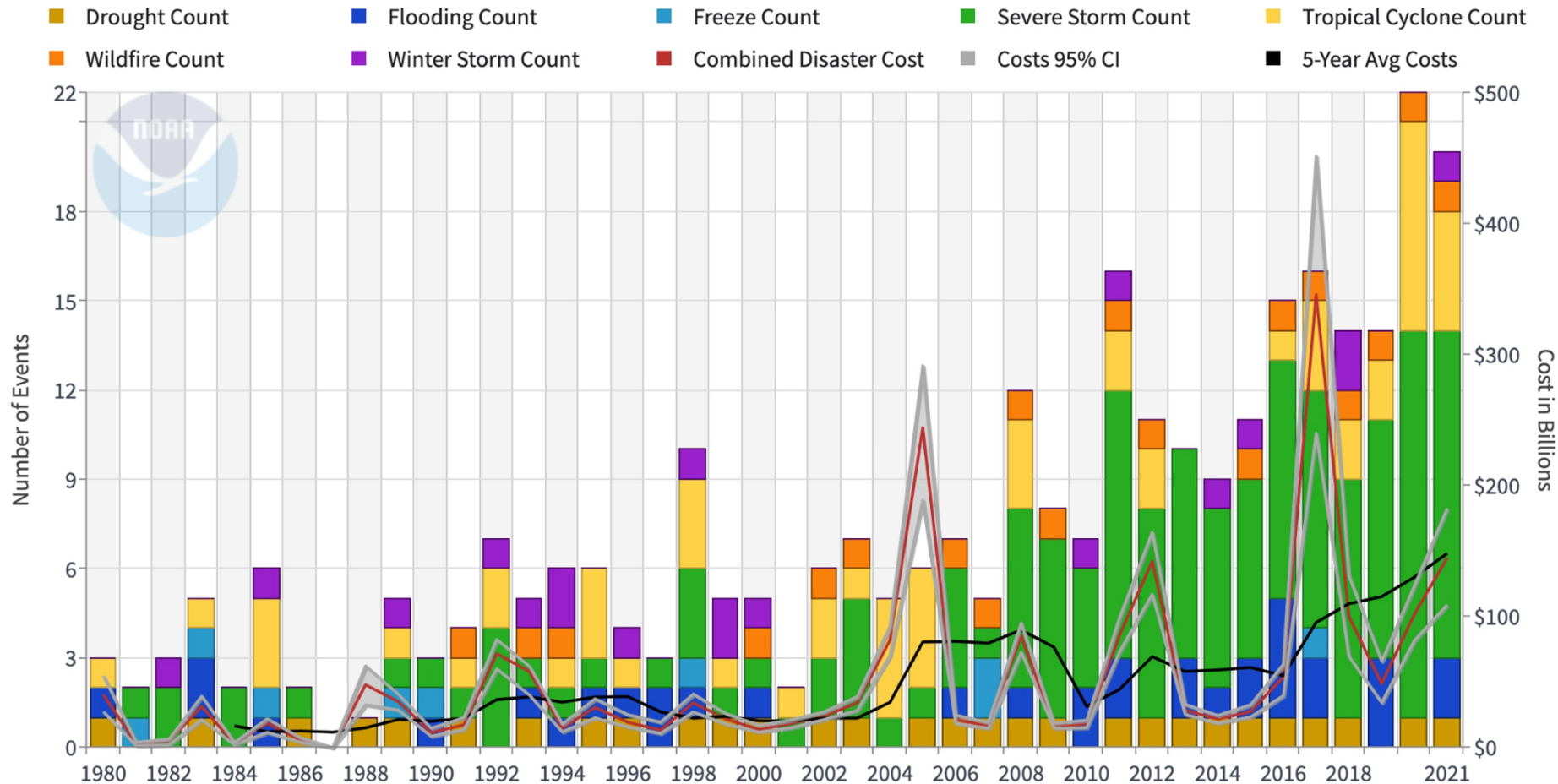
NOAA National Centers for Environmental Information: ncdc.noaa.gov/billions

NOAA National Environmental Satellite, Data, and Information Service



Events from 1980 to 2021

United States Billion-Dollar Disaster Events 1980-2021 (CPI-Adjusted)



Updated: January 10, 2022

Powered by ZingChart



Climate induced Disasters are impacting the world

UN unveils ambitious target to adapt to climate change and more extreme weather

- Between 1970 and 2019, more than 11,000 weather, climate and water hazards, with 4 million deaths and 230 million people affected.
- Only half of multi-hazard early warning systems.

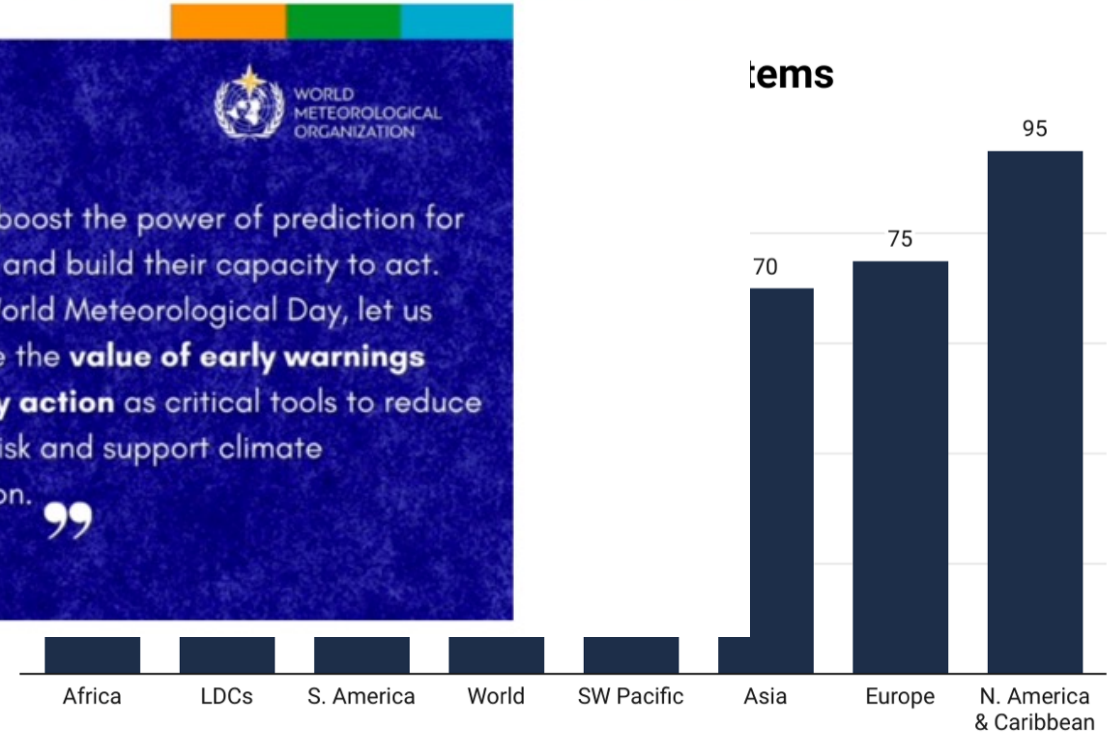


Chart: Joe Lo, Climate Home News • Source: World Meteorological Organization • Created with Datawrapper



Observations and Applications are needed with

- Free and open data policy for Earth Observation data
- Open-source software, standards and data. (Open science and data)
- Investments in training, capacity development, and the inclusion of stakeholders



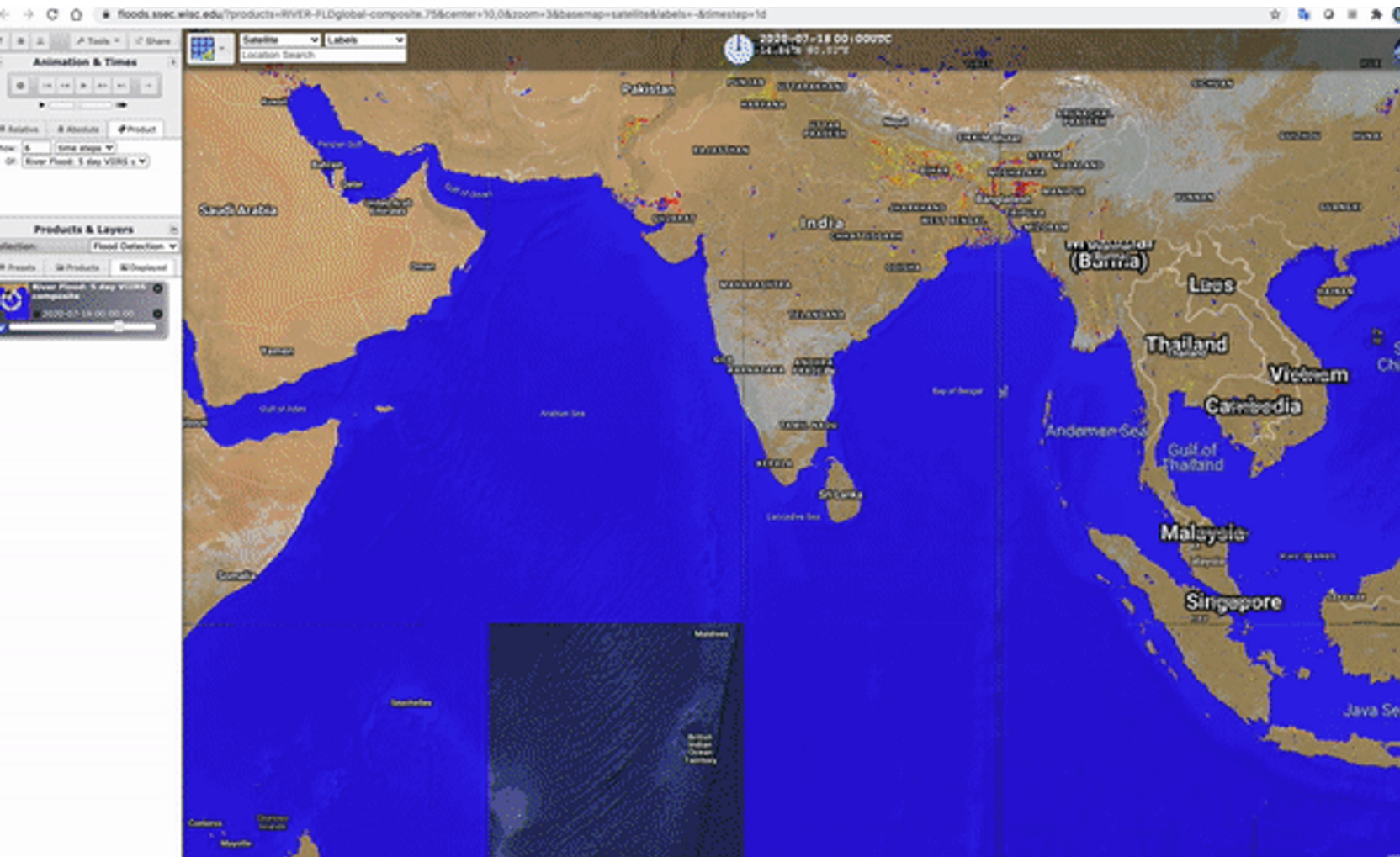


CSPP is so important

- Provides low latency products for hazards
 - Floods, Fires, Smoke, Heavy Precipitation, Sea Ice
- Applications are important on all time scales.
- CSPP is more than low latency products
- Supports open science and access by the community



NOAA/NESDIS Flood Watch Portal for universal access



<https://www.ssec.wisc.edu/flood-map-demo/flood-products/>

or use search engine - NOAA flood proving ground

also search for New York Times Great flood of 2019

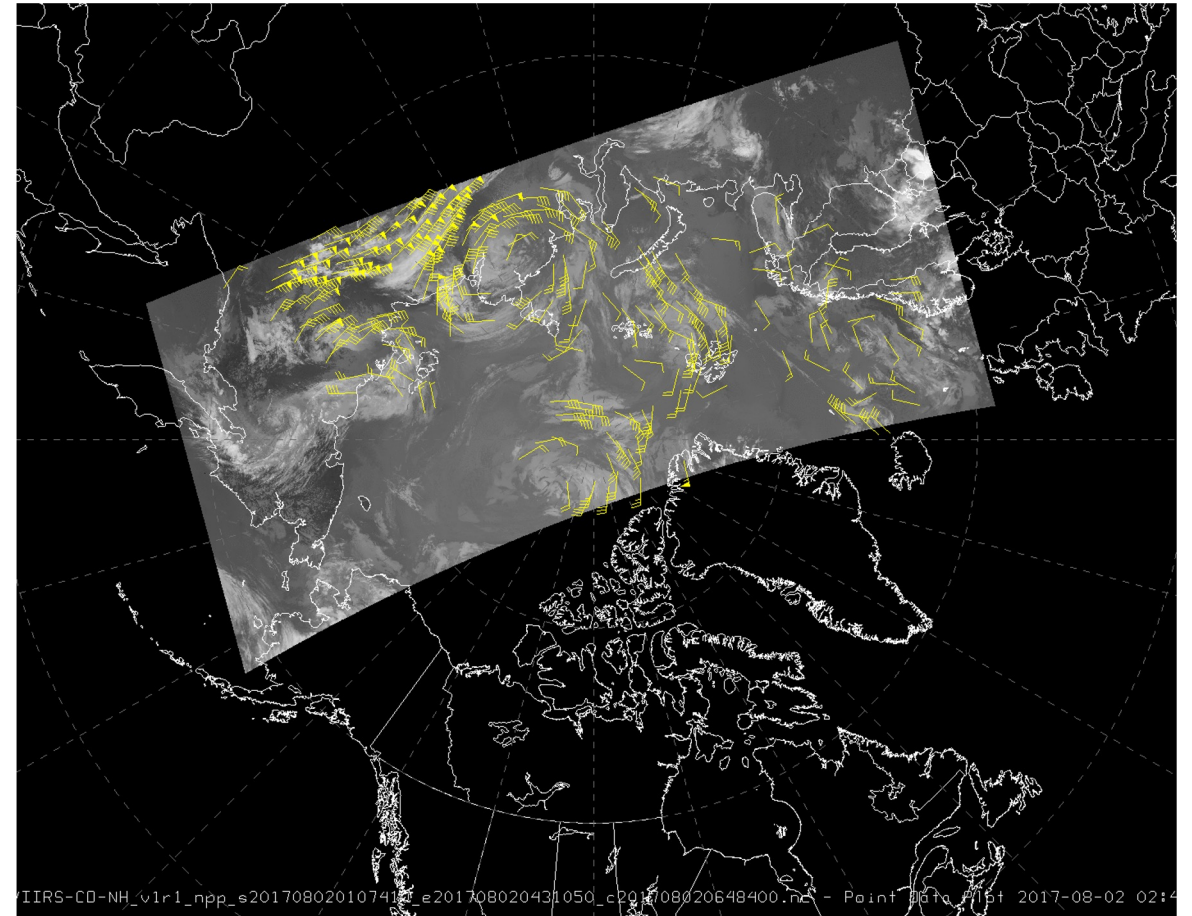
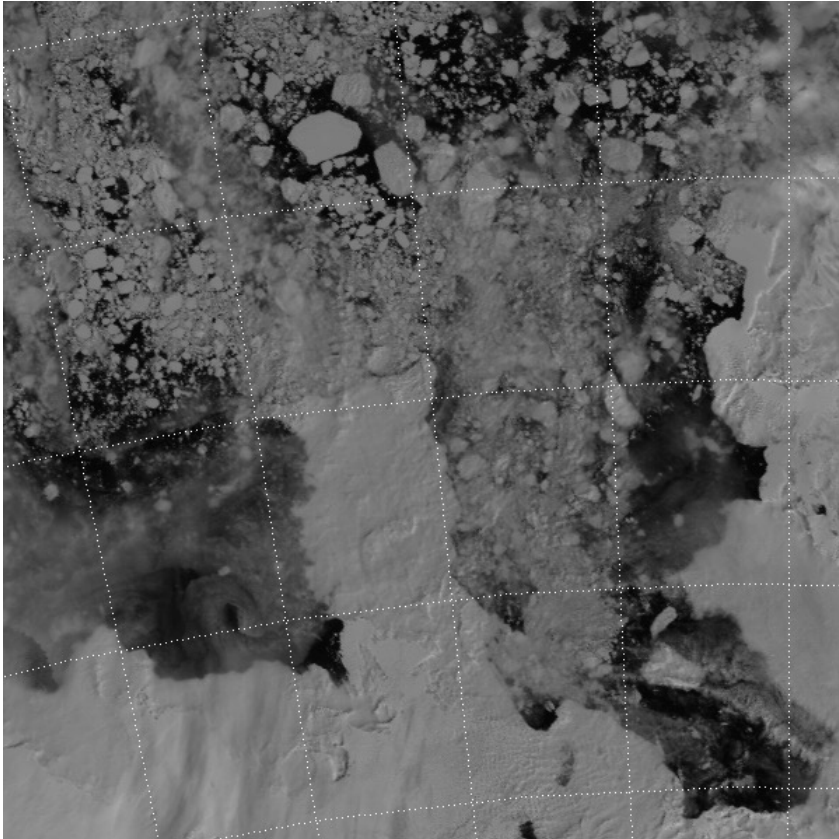
New York Times article using the GMU-NOAA flood algorithm

<https://www.nytimes.com/interactive/2019/09/11/us/midwest-flooding.html>

The New York Times

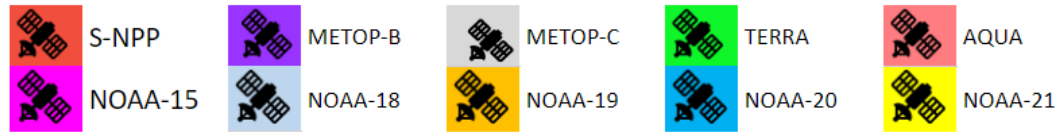
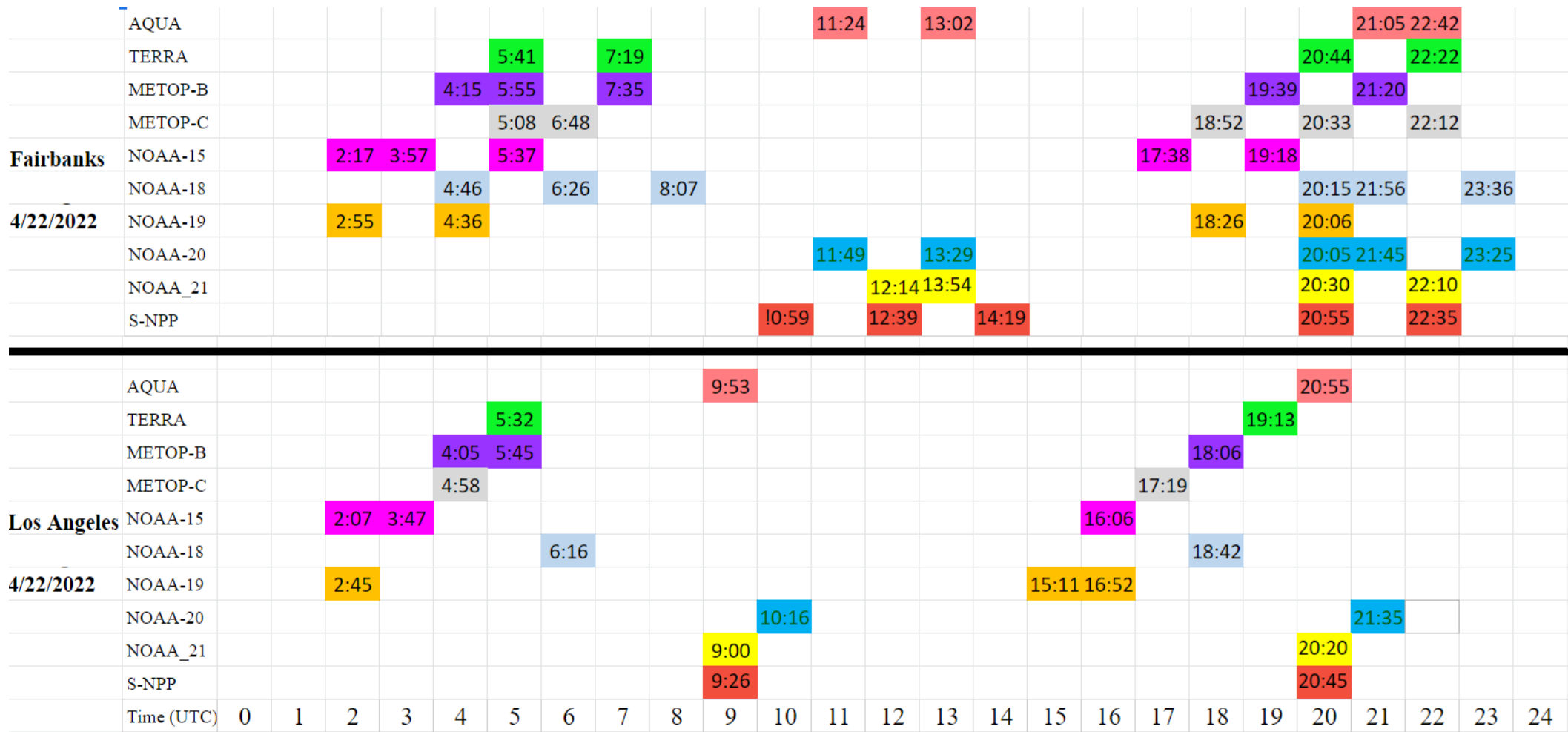


Low latency applications in the polar regions



Atmospheric Motion Vector winds

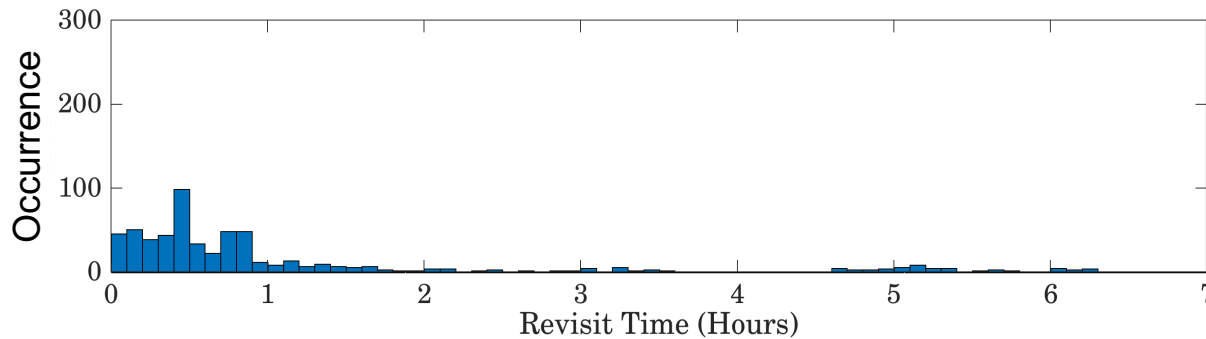
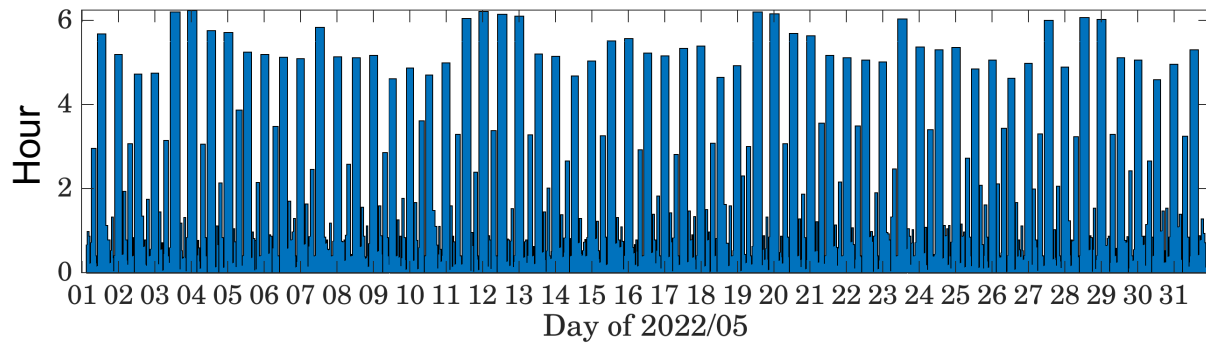
Observation Time Interval One Sample Day



Revisit Time Analysis of Operational Satellites

Los Angeles, California

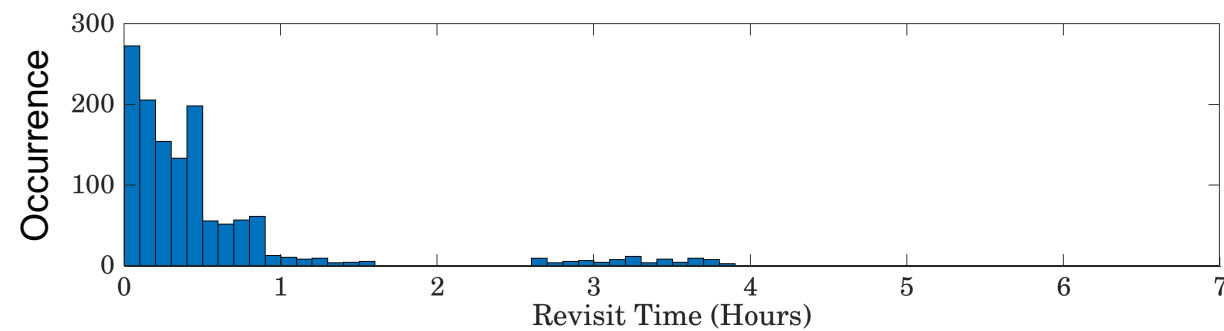
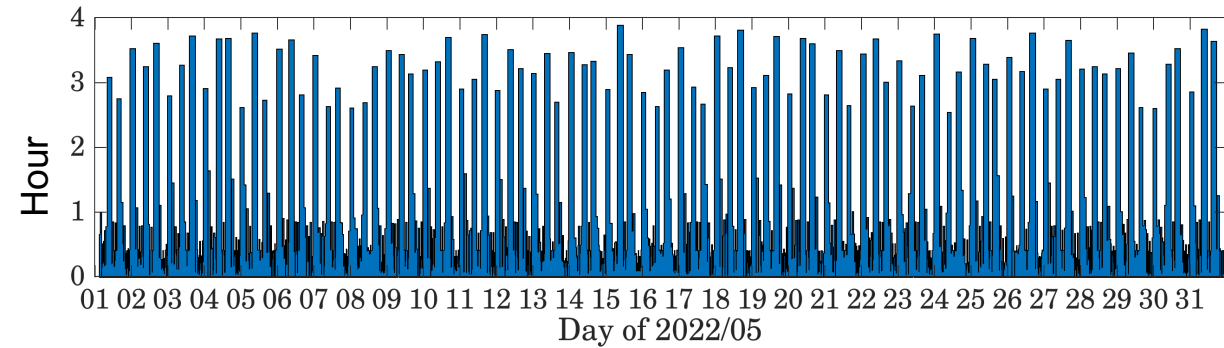
Los Angeles	Max (H)	Min	Mean (H)	Mean Daily Revisit	Mean Daily Revisit (< 1 hour)
10 Satellites	6.24 (H)	0.5 (min)	1.2 (H)	20	14.4



9 operational plus J2 (NOAA-21)

Fairbanks, Alaska

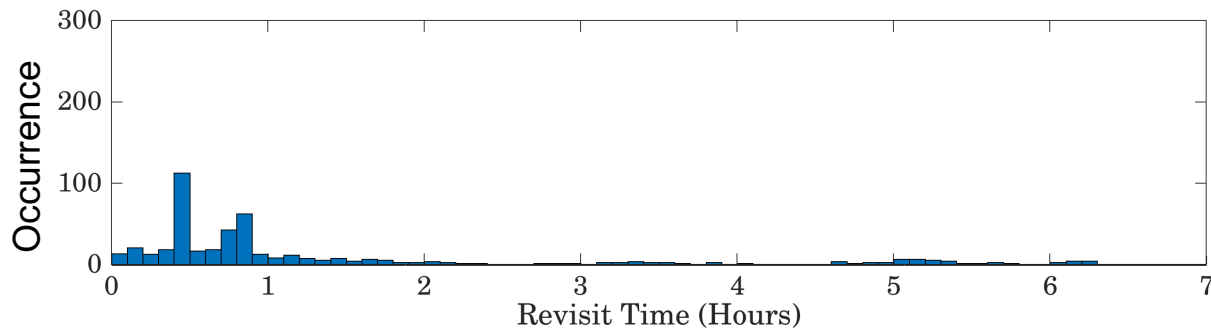
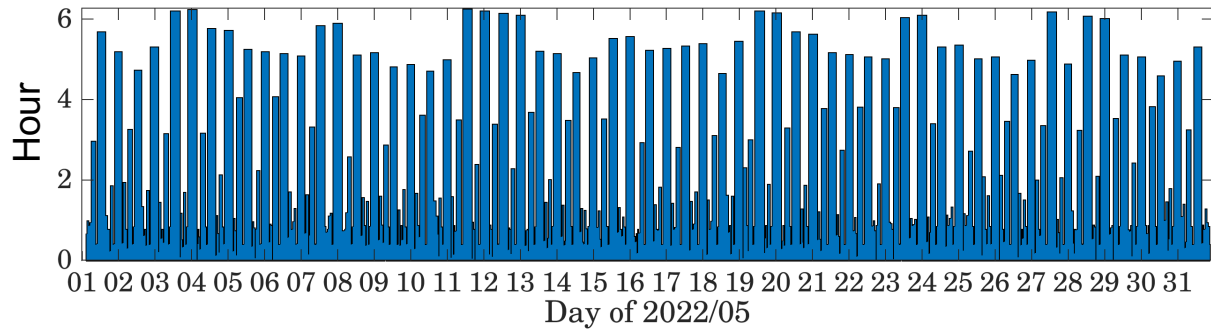
Fairbanks	Max (H)	Min	Mean (H)	Mean Daily Revisit	Mean Daily Revisit (< 1 hour)
10 Satellites	3.89 (H)	0	0.55 (H)	43.6	38.9



Revisit Time Analysis of 8 satellites (Exclude TERRA and AQUA)

Los Angeles, California

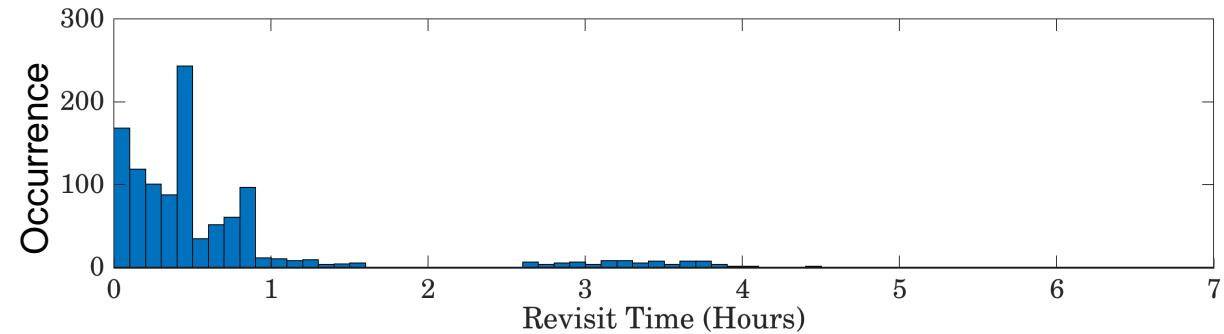
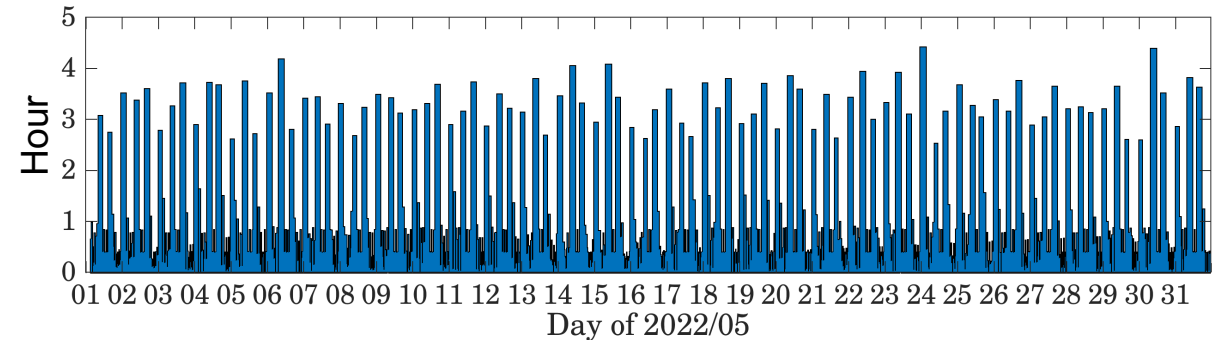
Los Angeles	Max (H)	Min	Mean (H)	Mean Daily Revisit	Mean Daily Revisit (< 1 hour)
8 Satellites	6.27 (H)	0.5 (min)	1.46 (H)	16.4	10.8



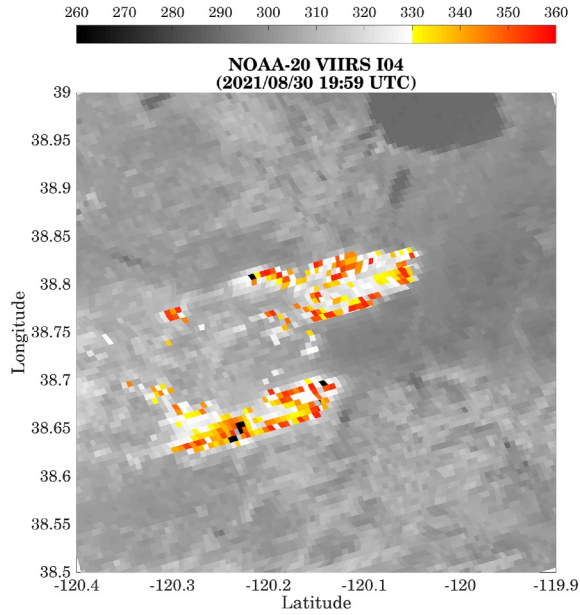
7 operational plus J2 (NOAA-21)

Fairbanks, Alaska

Fairbanks	Max (H)	Min	Mean (H)	Mean Daily Revisit	Mean Daily Revisit (< 1 hour)
8 Satellites	4.43 (H)	0	0.66 (H)	36.4	31.6



NOAA-20 VIIRS I04

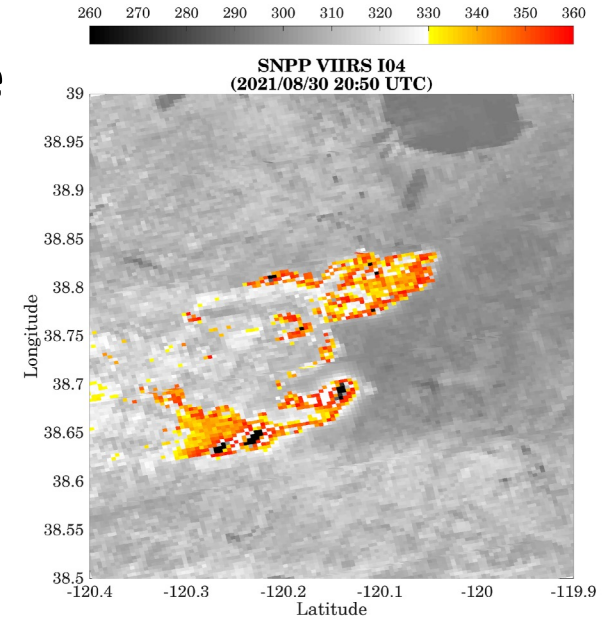


California Caldor Fire on August 30, 2021

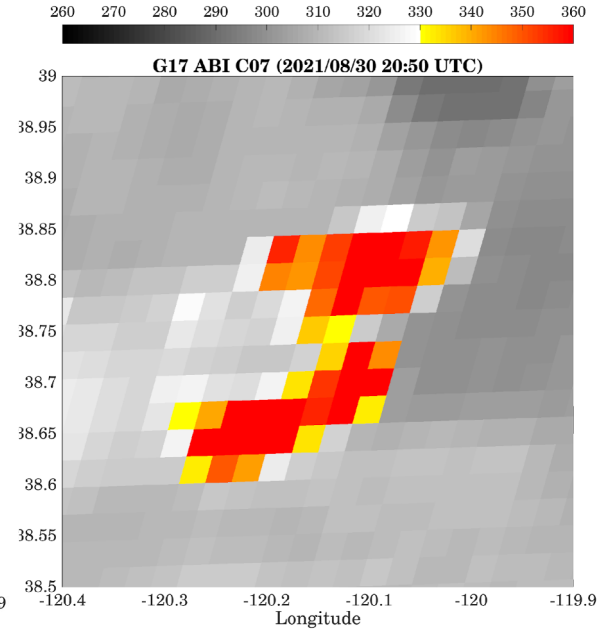
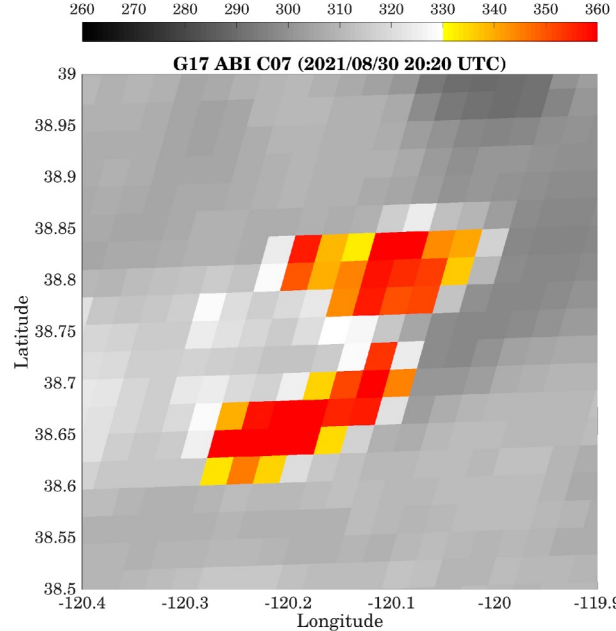
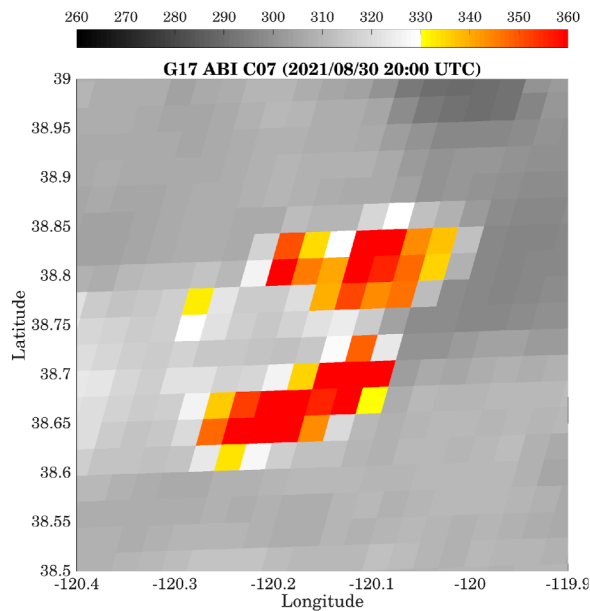
Fire intensified within
50 min



SNPP VIIRS I04



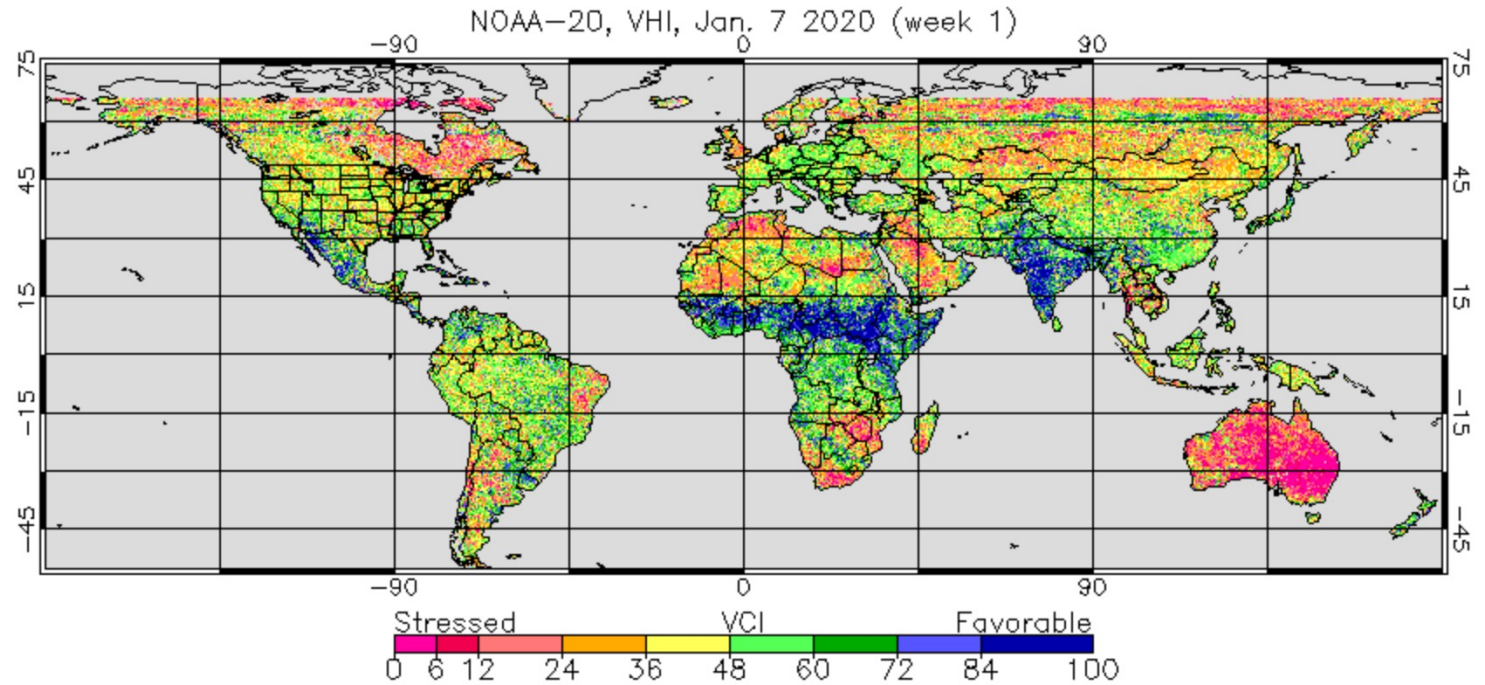
ABI Observations



Satellite Applications: NOAA-20 VIIRS Vegetation Health

JPSS products includes vegetation health, which is used by agencies (e.g. USDA) around the world to monitor agricultural productivity.

The extreme fires occurring in Australia are a result of a drought combined with high temperatures. Note the low values of VH in New South Wales.



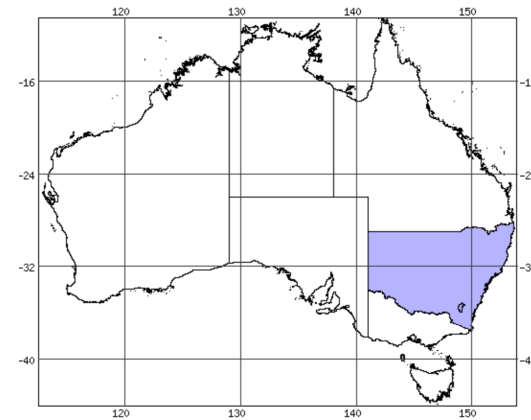
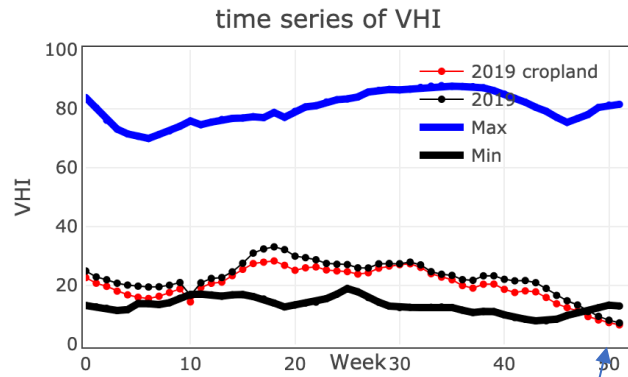
USDA United States Department of Agriculture
 ISSN: 1554-9089

World Agricultural Supply and Demand Estimates

Office of the Chief Economist Agricultural Marketing Service Economic Research Service
 Farm Service Agency Foreign Agricultural Service

WASDE - 595 Approved by the World Agricultural Outlook Board December 10, 2019

“Australia’s crop is estimated to be 16.1 million tons. This is Australia’s smallest crop since 2007/08”



Below the climatological minimum

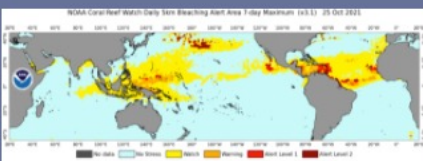


[Coral Reef Watch Home](#)

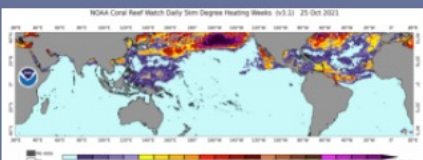
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[Near-Real-Time Data
\(5km Resolution\)](#)



[Bleaching Alert Area \(Alerts\)](#)



[Degree Heating Week \(DHW\)](#)



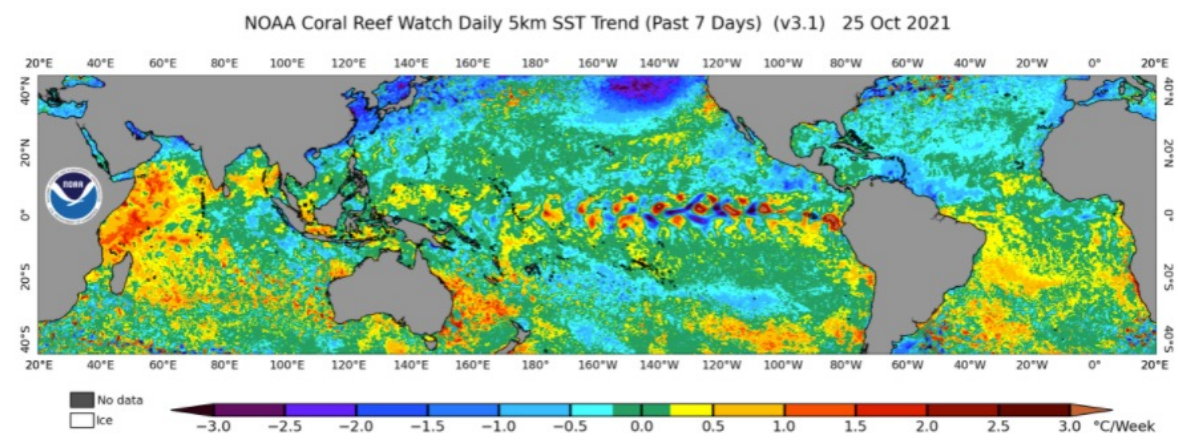
Coral Reef Watch Satellite Monitoring and Modeled Outlooks

Hover over buttons below image to change product; then click on button or image to navigate to product's page.

5km data

5km composite products

Outlook



Atmospheric
CO₂
Now

Alerts

DHW

HotSpot

SST (CoralTemp)

Anomaly

SST Trend

Virtual Stations

Complete Products List

Current ENSO Conditions and Forecasts

Report Field Data & Observations of Coral Bleaching/No Bleaching





Can CSPP support open science?

- Can anyone download the VIIRS fire software, download SDRs from NCEI and process the entire SNPP record and generate a climate data record?
- Open science must also be smart science. We would need to document all the possible issues and limitations.
- We still need an official curator.
- But the procedures to generate the CDR should be repeatable.





BRIEFING ROOM

FACT SHEET: Quad Leaders' Tokyo Summit 2022

MAY 23, 2022 • STATEMENTS AND RELEASES

In Tokyo, President Biden, Prime Minister Anthony Albanese of Australia, Prime Minister Modi of India, and Prime Minister Kishida of Japan will advance the Quad's ambitious and diverse agenda, including through a major new initiative to improve maritime domain awareness across the Indo-Pacific.

The leaders of the Quad nations—Australia, India, Japan, and the United States—will meet on May 24, 2022 in Tokyo for the fourth time and the second time in person. Established in the wake of the 2004 Indian Ocean Tsunami to coordinate humanitarian assistance and disaster relief, the Quad has since become a leading regional partnership dedicated to advancing a common vision of a free and open Indo-Pacific through practical cooperation on diverse 21st-century challenges. With six leader-level working groups—on COVID-19 Response and Global Health Security, Climate, Critical and Emerging Technologies, Cyber, Space, and



Space



As leaders in space, Quad countries are strengthening cooperation and pooling our collective expertise to exchange satellite data, enable capacity-building, and consult on norms and guidelines.

- Quad partners will strengthen their commitments to the free, full, and open **sharing of space-based civil Earth observation data**, and will jointly develop and promote the concept of Open Science in the region and globally.
- The United States will coordinate with Quad partners on its **cooperative civil Earth observation programs**, to include the National Aeronautics and Space Administration (NASA) GLOBE and DEVELOP programs; the National Oceanic and Atmospheric Administration (NOAA) Community Satellite Processing Package (CSPP) and Satellite Proving Ground Flood Mapping Portal; as well as the U.S. Geological Survey (USGS) National Land Imaging Program.
- As extreme weather events become ever more common in the Indo-Pacific, Quad partners will convene technical experts to drive new cooperation and set the stage for additional **disaster mitigation** and **humanitarian assistance and disaster relief** workshops or training among Quad partners.





Thinking of the future

- CSPP is more than processing data from direct broadcast
- Access to data is the critical path. (direct broadcast ,global feed, archives)
- Easily accessible software packages like CSPP will be critical
- CSPP can pave the way – by demonstrations of open science, easy access and applications
- Need Application tools (like the flood portal using RealEarth)
 - RealEarth in a box
- User Engagement and Training are paramount

-  USA
-  JAPAN
-  SOUTH KOREA
-  INDIA
-  CHINA
-  FRANCE
-  RUSSIA

-  NOAA
-  EUMETSAT
-  EUROPEAN COMMISSION
-  NATIONAL SPACE ORGANIZATION (NSPO)
-  EUROPEAN SPACE AGENCY
-  NASA



-  GEOSTATIONARY ORBIT
-  NEAR-POLAR ORBIT
-  LAGRANGE POINT 1

Our aspiration

Provide a truly integrated digital understanding of our earth environment that can evolve quickly to meet changing user expectations by leveraging our own capabilities and partnerships

NESDIS
Reimagined