

National Environmental Satellite, Data, and Information Service (NESDIS)

Why Now? More Disasters, Greater Severity

KEEPING US SECURE

The estimated value of NASA and NOAA information services to the U.S. Navy's operational effectiveness is **\$2 billion** per year.

The U.S. Navy and other U.S. defense agencies partner with NASA and NOAA to use satellites data, to access operational services, and to leverage their scientific progress.

MITIGATING NATURAL DISASTERS

Extreme weather and fires have cost the federal government more than **\$350 billion** over the past decade.

Satellite measurements play a critical role in tracking the paths of hurricanes and wildfires so that we can warn populations at risk, assess the damages, and avoid future costs.

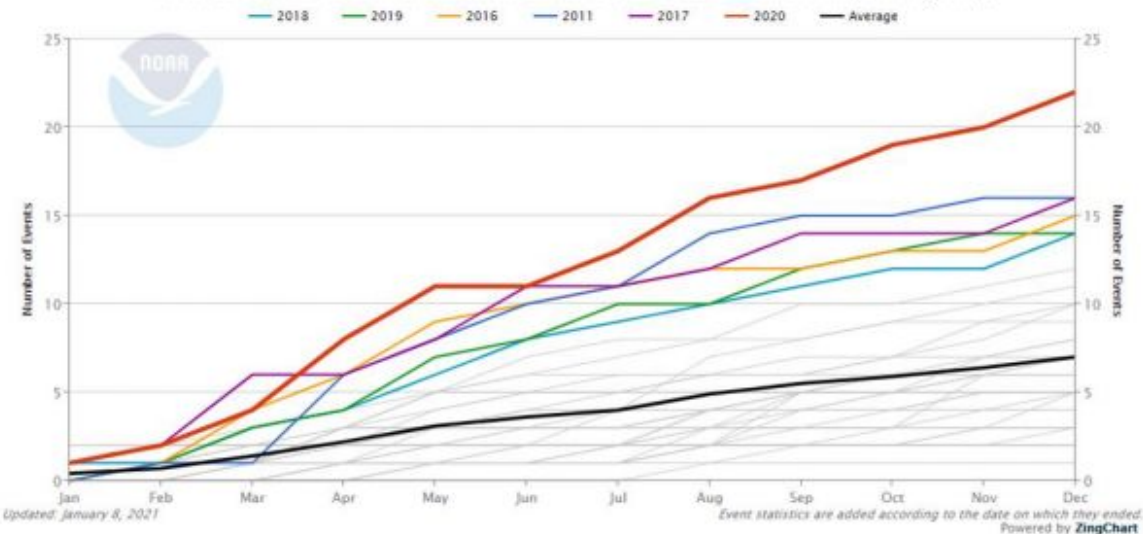
ENSURING RESOURCE AVAILABILITY

Advanced technology, including many types of Earth information will unlock up to **\$1.6 trillion** in economic savings for energy generation and use by 2035.









Satellite observations can also help ensure water availability, which is particularly important to the 20% of the world now living in areas of water scarcity.

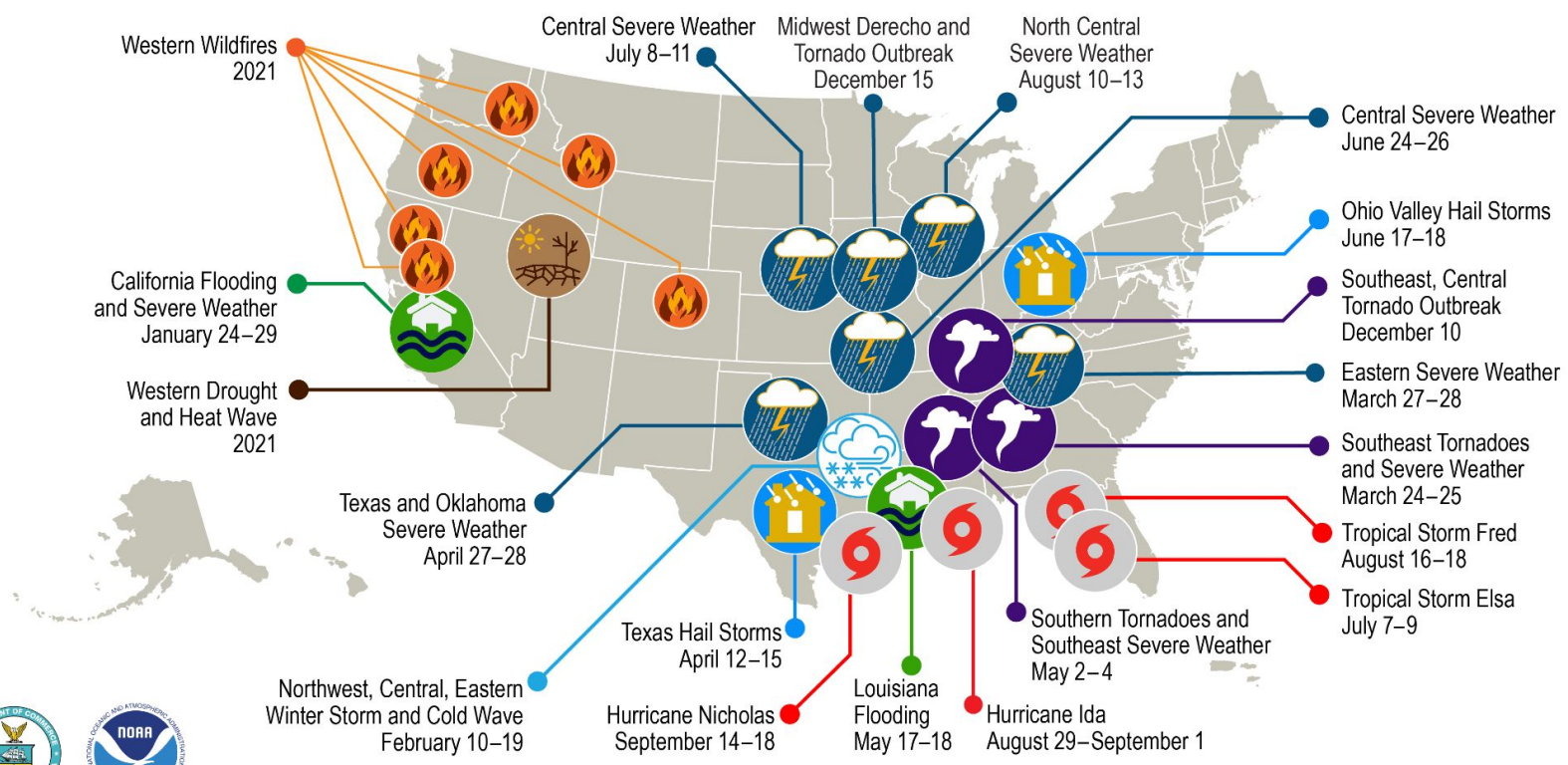
NOAA's Earth observations add a **value of \$315 billion** to the nation's economy, protecting and improving weather-vulnerable industries such as farming, shipping, and utilities.

1980-2020 Year-to-Date United States Billion-Dollar Disaster Event Count (CPI-Adjusted)



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

-  Drought/Heat Wave
-  Flooding
-  Hail
-  Hurricane
-  Tornado Outbreak
-  Severe Weather
-  Wildfire
-  Winter Storm/Cold Wave

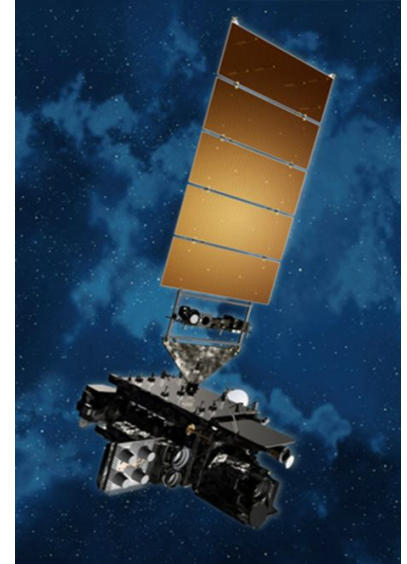


This map denotes the approximate location for each of the 20 separate billion-dollar weather and climate disasters that impacted the United States in 2021



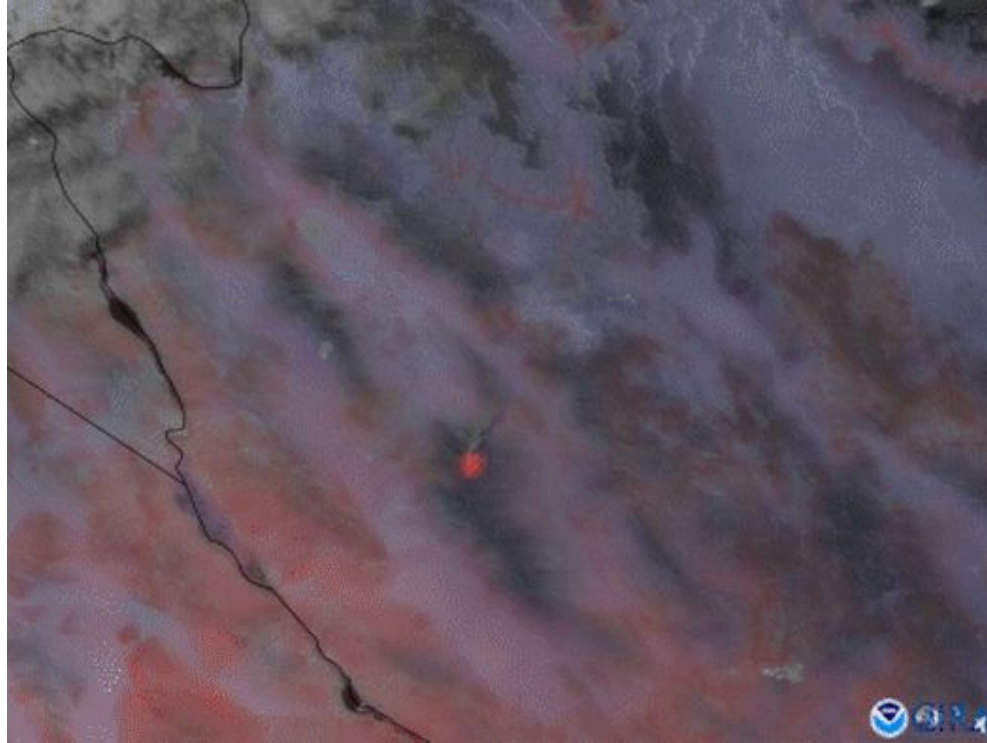
National Security, Safety, and Prosperity

- NESDIS operates the Nation's weather satellites, 24/7
- Acquires next-generation satellites to observe the Earth
- Provides data and imagery for environmental and atmospheric modeling
- Assesses the U.S. and global climate
- Maintains one of the most significant archives of environmental data on Earth



95 percent of the data used in weather forecast models come from satellites.

We are a trusted source of environmental information for the United States...

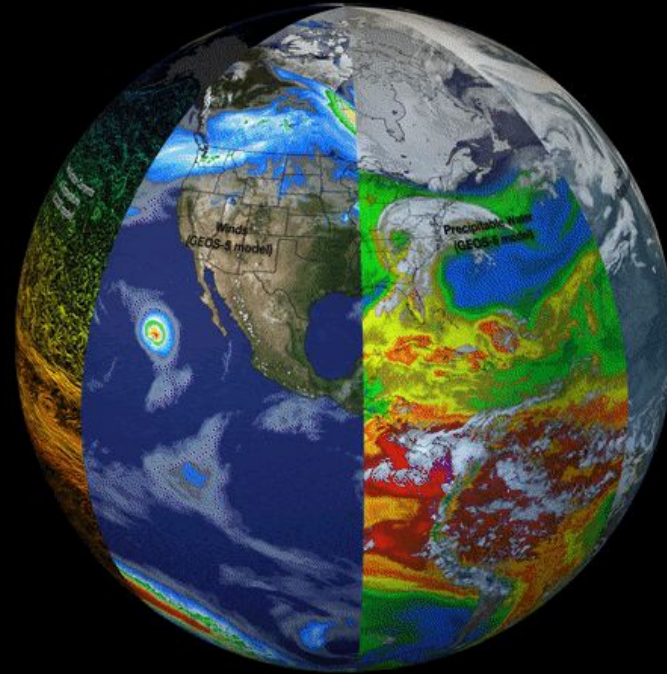


Satellite imagery of the April 2021 Flag Fire in Arizona. (GOES West)

... with a global perspective

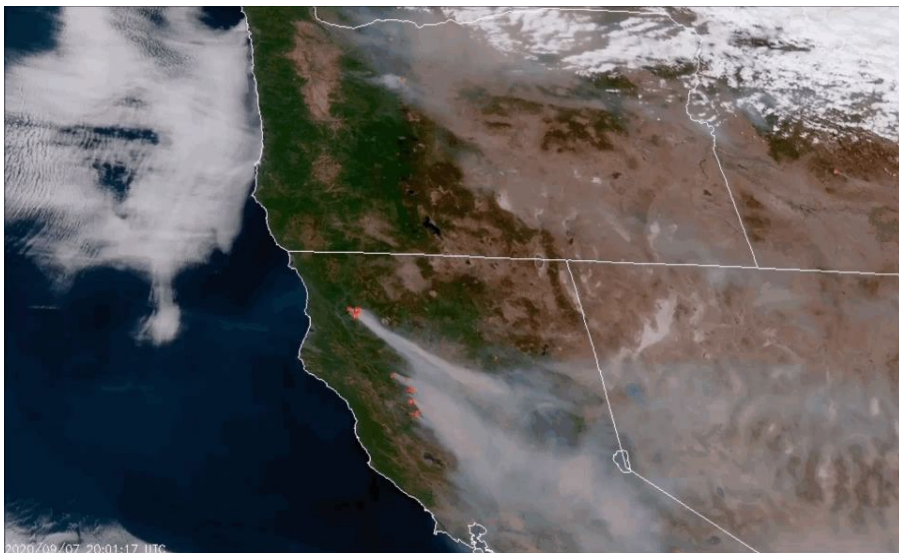
NESDIS Mission

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



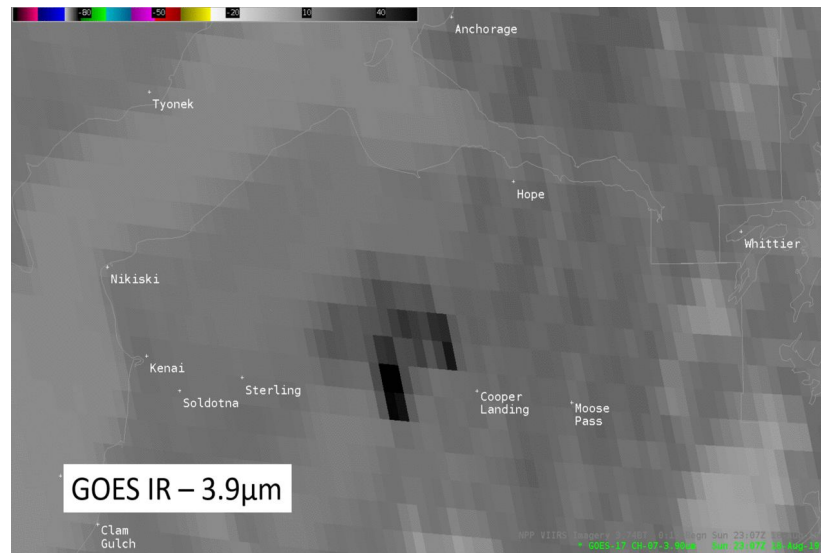
NOAA Satellite Capabilities

GOES-R Series - Geostationary



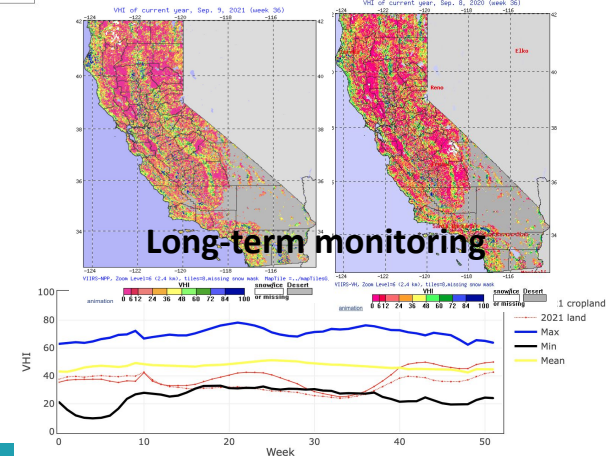
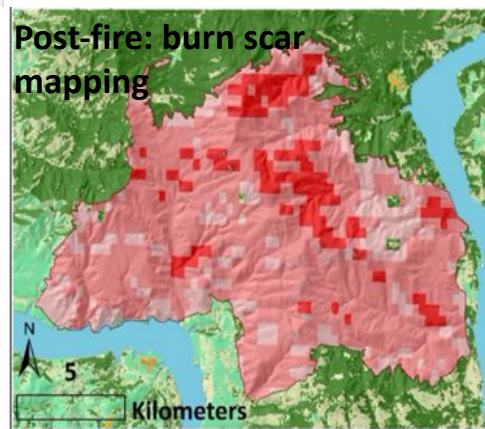
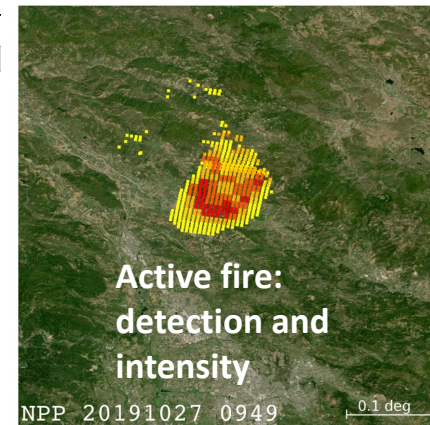
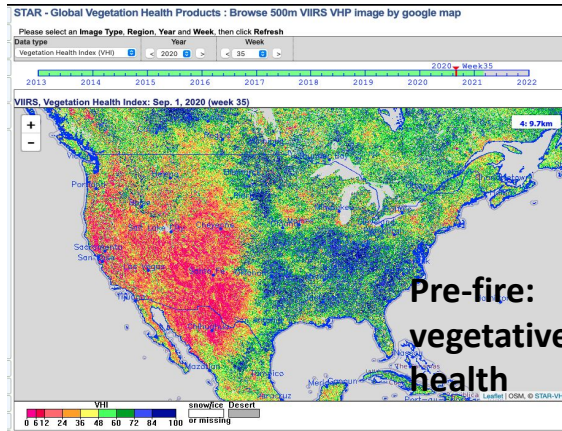
Oregon and California Fires, September 7 – 9, 2020
GOES-East and West provides nearly continuous observations of fires at a 2-3 km resolution (function of latitude ~6 km in central Alaska)

JPSS Series - Polar orbiting



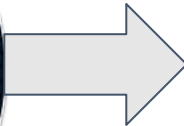
Spatial resolution is important - JPSS polar orbiting satellites are particularly critical for higher latitudes - Next generation GEO-XO will improve GOES-R spatial resolution by 4X

NOAA Satellites for Fire Information

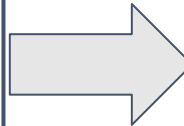


Future: Dedicated Wildfire Information System

Single or multi-source GEO or LEO satellite data + supplemental data



NOAA/NESDIS Wildfire Information System



NOAA/NESDIS Wildfire Storefront



Event-based product access

Fire Information Needs of the Insurance Industry

- What products or information are you looking for that we have NOT presented?
- Are there any research questions that would help the insurance industry better incorporate the drought context?
- How can insurance products be developed and utilized to better build resilience to fire? Do you have incentives for actions to minimize fire risk?
- Would you be interested in having a smaller follow up discussion to inform NESDIS Fire Program investments in support of the Insurance Industry?

Data Access



NESDIS Operational Active fire products: geostationary

- Geostationary Operational Environmental Satellite – R (GOES-R): Advanced Baseline Imager (ABI)
 - GOES-16 (East); GOES-17 and GOES-18 (West)
 - 2km (at sub-satellite point) Fire Detection and Characterization (FDC)
 - full fire mask (fire detections, with confidence classes, clear land, water, cloud, etc.); fire radiative power (FRP)
 - Full Disk: 10 min; Conterminous / Pacific US (CONUS / PACUS): 5 min; Mesoscale: 30 or 60 sec

- Data access

- Amazon Web Services

<https://noaa-goes16.s3.amazonaws.com/index.html>

<https://noaa-goes17.s3.amazonaws.com/index.html>

- NOAA CLASS (Comprehensive Large Array – Data Stewardship System): GOES-R Series ABI Products (GRABIPRD) -> Fire/Hot Spot Characterization

<https://www.avl.class.noaa.gov/saa/products/welcome>

- NOAA Hazard Mapping System (pre-screened fire data and visualization)

<https://www.ospo.noaa.gov/Products/land/hms.html>

- NOAA AerosolWatch: visualization (including aerosol/smoke products)

<https://www.star.nesdis.noaa.gov/smcd/spb/aa/AerosolWatch/>



GOES-16 ABI, August 31, 2021

- Joint Polar Satellite System (JPSS): Visible Infrared Imaging Radiometer Suite (VIIRS)
 - Currently Suomi NPP and NOAA-20 (50 minutes apart on the 1:30 am/pm orbit); JPSS-2 -> NOAA-21 to be launched on 11/2/2022
 - 375m (updated; recommended); and 750m (MODIS heritage); daytime and nighttime; ~86 second granules
 - full fire mask (fire detections with confidence classes, clear land, water, cloud, etc.); fire radiative power (FRP); persistent anomaly flag (likely detection due to non-biomass burning sources of signal)

- Data access
 - NOAA CLASS (Comprehensive Large Array – Data Stewardship System): JPSS VIIRS Products (Granule)(JPSS_GRAN) -> VIIRS Active Fires I-band (or M-band) EDR

<https://www.avl.class.noaa.gov/saa/products/welcome>

- NOAA Hazard Mapping System: pre-screened fire data and visualization

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- JSTAR Mapper: visualization of operational VIIRS fire products (and additional products)

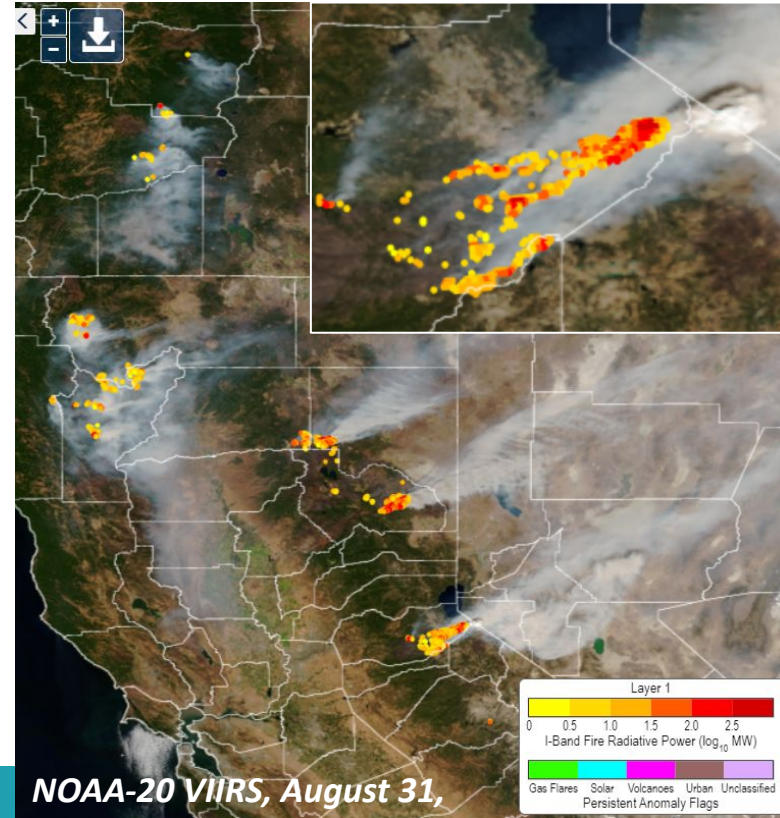
<https://www.star.nesdis.noaa.gov/jpss/mapper/>

- NOAA AerosolWatch: visualization (including aerosol/smoke products)

<https://www.star.nesdis.noaa.gov/smcd/spb/aq/AerosolWatch/>

- AWS access is forthcoming

NESDIS Operational Active fire products: polar



NESDIS Operational Products for pre- and post-fire assessment

- Vegetation Health / Drought / Fire Risk (16 km, 4km, 1km)

<https://www.star.nesdis.noaa.gov/smcd/emb/vci/VH/index.php>

- Evapotranspiration (2km)

https://www.star.nesdis.noaa.gov/smcd/emb/droughtMon/products_droughtMon.php

- Soil Moisture

- NOAA Soil Moisture Products System (SMOPS; 0.25 x 0.25 degree grid)

- near-real-time: <https://www.ospo.noaa.gov/Products/land/smops/>
- archive: NOAA CLASS - Soil Moisture Operational Product System (SMOPS)

<https://www.avl.class.noaa.gov/saa/products/welcome>

- JPSS Land Environmental Data Records

- Annual Land Cover / Surface Type (1km)

<https://www.ncei.noaa.gov/metadata/geoportal/rest/metadata/item/gov.noaa.ncdc:C01472/html>

- Vegetation Indices, Land Surface Temperature (1km, 4km)

- NOAA CLASS - JPSS VIIRS Products (Non-Granule)(JPSS_NGRN)

<https://www.avl.class.noaa.gov/saa/products/welcome>

