EARTH SCIENCE
APPLIED SCIENCES
DISASTERS

REDUCING WILDFIRE RISK

NASA missions and science push the limits of knowledge and innovation in the study of Earth and atmospheric science. The NASA Earth Applied Sciences Disasters program area aims to share this knowledge with domestic and international agencies responding to the threat of fires before, during, and after they impact local communities.

NASA takes an Earth-system approach to reveal the knowledge needed to understand wildfire risks and translate that understanding into actionable information. Our resources can inform capabilities to assess potential wildfire threats, anticipate what may happen next, and help leaders and emergency officials understand and identify effective interventions. Learning from collaborations in previous fire seasons helps us know where we can improve or fill critical knowledge gaps. Greater insight can transform how communities strengthen resilience, respond to perils, aid relief, and sustain recovery.

ROUTINE PRODUCTS

The program area has developed a catalog of imagery and data products used in previous fire seasons by the user community. This abbreviated list serves as a starting point of available resources used in past wildfire seasons. These resources can help:

- Create easily accessible and usable information to inform choices to develop resilience, support disaster management, and guide actions toward faster and sustained recovery
- Enable the situational awareness needed to prioritize planning, target response, and focus recovery efforts
- Advance actionable understanding of the wildfire risks and the nature of vulnerability and exposure

| PRODUCT TYPE	PRODUCT NAME	PURPOSE	RESOLUTION WAND LATENCY	LINKS TO DATA
Active Fire Detection	FIRMS Active Fire Points	Determine which regions are currently burning	MODIS – 1km, VIRS – 375m updated every 3 hours	VIIRS/MODIS FIRMS Active Fire
Burn Extent	Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER)	Identifying burned region	15m, varies	California Fires 2020
Soil Moisture	Land Information System (LIS)	Identify dryness conditions that make fires more likely	3km, updated daily	10cm 100cm 200cm
Damage Detection	Damage Proxy Map (DPM)	Identify potentially damaged buildings and infrastructure	30m, 1-2 days after good overpass	Bobcat Fire 2020 Creek Fire 2020
Power Outage	Black Marble	Identify areas that lost power	750m, updated daily	Black Marble Nighttime
Optical Imagery	Burn Scars and True Color	Aids in identifying burned areas	Resolution and latency varies based on sensor	MODIS/Aqua Burn Scar MODIS/Terra Burn Scar VIIRS/Suomi-NPP Burn Scar VIIRS/NOAA-20 Burn Scar MODIS/Aqua True Color MODIS/Terra True Color VIIRS/Suomi-NPP True Color VIIRS/NOAA-20 True Color

For a full list of NASA Disasters Mapping Portal products for fire response, please refer to the NASA Disasters Mapping Portal Product Guide.
View more NASA products for fire support at NASA Earthdata.

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EVENT-SPECIFIC PRODUCTS AVAILABLE UPON REQUEST FOR FIRE RISK REDUCTION, RESPONSE AND RECOVERY

NASA Applied Sciences Program develop event-based products to answer specific questions from the user community.

• A hallmark of the Disasters program, these products strive to provide additional information to user workflows.
• Products may use techniques more experimental in nature.
• Partnerships with stakeholders enable both the advancement of science and the expansion of user knowledge.
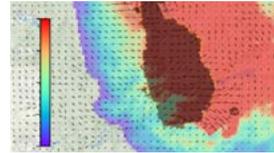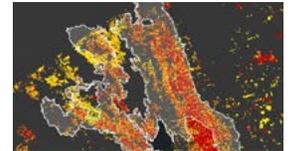

WRF-SFIRE FUEL MOISTURE, SMOKE AND FIRE PROGRESSION FORECASTS
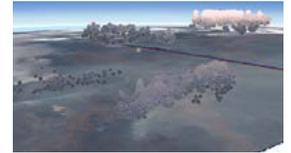
MISR 3D SMOKE PLUME HEIGHTS

IMAGECAT FIRE PROXIMITY TO RESIDENTIAL AREAS

SAR DAMAGE PROXY MAPS


NASA DISASTERS MAPPING PORTAL

The Mapping Portal serves as a hub of relevant near real-time (NRT) and event-specific products developed by NASA scientists and collaborators and provided in geographic information systems (GIS) format. The fire emissions dashboard displays multiple gas and aerosol datasets generated by the Global Fire Emissions Database (GFED).

Click here to visit the Global Fire Emissions dashboard.

NASA AIRBORNE FIRE SUPPORT

NASA operates a fleet of aircraft and airborne sensors that contribute to risk reduction, response and recovery from wildland fires. Airborne sensors such as MASTER, AVIRIS, and UAVSAR collect data on fire spread, air quality and burn scars, which provide critical awareness for responders on the ground and a greater understanding of how communities are impacted by fire.

Click here to learn more about NASA Airborne Fire Support.
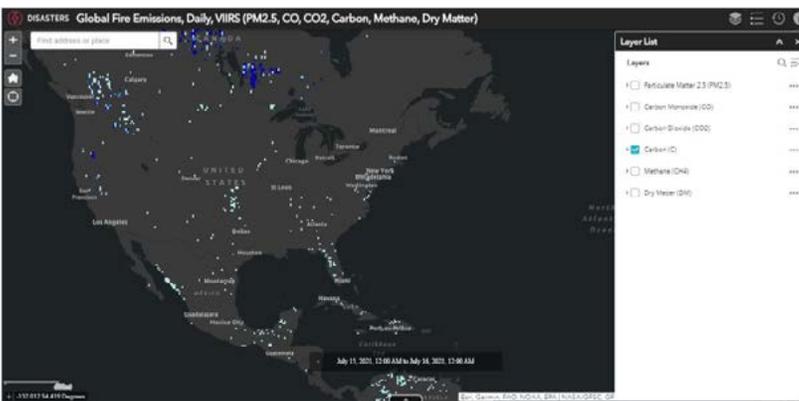
NASA's Land, Atmosphere Near real-time Capability for EOS (LANCE) Fire Information for Resource Management System (FIRMS) distributes NRT active fire data within three hours of satellite observation from both MODIS and VIIRS.

SUPPLEMENTAL INFORMATION

Disasters Mapping Portal Fires Homepage
Notable Past Activation Story Maps:
California Fires 2020
Australia Fires 2020

Scan the QR code here to visit the Wildfires program area landing page