

# Ames Earth Science Promotes Wildfire Science and Management

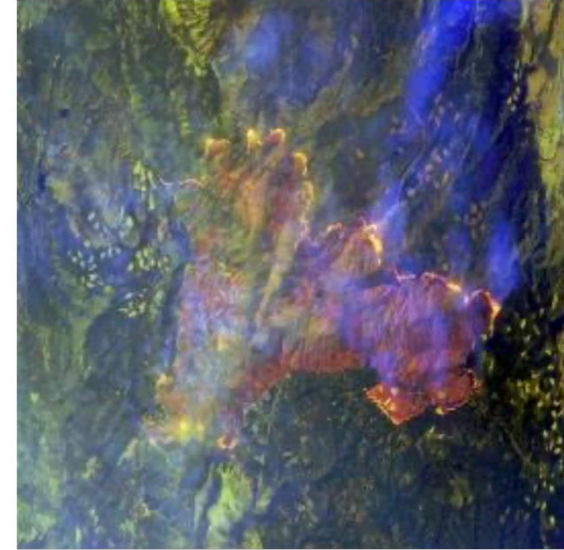
**Background:** In 2021, the US experienced over 58,500 wildland fires that resulted in more than 7M acres burned. The nation's 5-year fire suppression costs are estimated at \$2.35B, with significant impacts to human health and infrastructure. The fire season continues to get longer and the duration of large fires continue to increase, a problem that will only worsen under projected climate change.

The ARC Earth Science Division serves as a core partner in NASA's new Wildland Fire Initiative, a cross-mission directorate, multicenter effort focused on creating a new wildland fire management paradigm that takes full advantage of the best available science and technology to overcome current barriers in wildland fire management.

Airborne data such as those acquired by the MODIS/ASTER Airborne Simulator (MASTER) instrument, built and maintained by ARC's Airborne Sensor Facility, are critical to these efforts. MASTER is a multiband imaging spectrometer that remotely senses land cover changes from the visible to longwave infrared wavelengths. MASTER thermal data can effectively capture flaming fire fronts to help better understand wildfire behavior and spread, enabling fire managers to more effectively respond to wildfire incidents.

**Impact:** MASTER data are routinely acquired in the Western Diversity Time Series (WDTS) field campaigns that began in 2020, as well as in the HypsIRI (Hyperspectral Infrared Imager) campaigns in the decade prior. On 8-9 Sep 2022, MASTER imaged the Mosquito Fire, west of Lake Tahoe. MASTER data showcase NASA's new Wildland Fire Initiative, better characterize and track fire behavior, and serve as a calibration and validation standard for new sensors.

**More info on MASTER:** <https://asapdata.arc.nasa.gov/sensors/master.html>



MASTER images of the Mosquito fire. Left image: 2.1  $\mu\text{m}$ , 1.6  $\mu\text{m}$ , 0.54  $\mu\text{m}$  bands; Right image: 4  $\mu\text{m}$ , 2.1  $\mu\text{m}$ , 1.6  $\mu\text{m}$  bands. Note the exclusion of smoke in the right image by only using the thermal bands.



MASTER imaging spectrometer



ER-2 aircraft flying over Plume