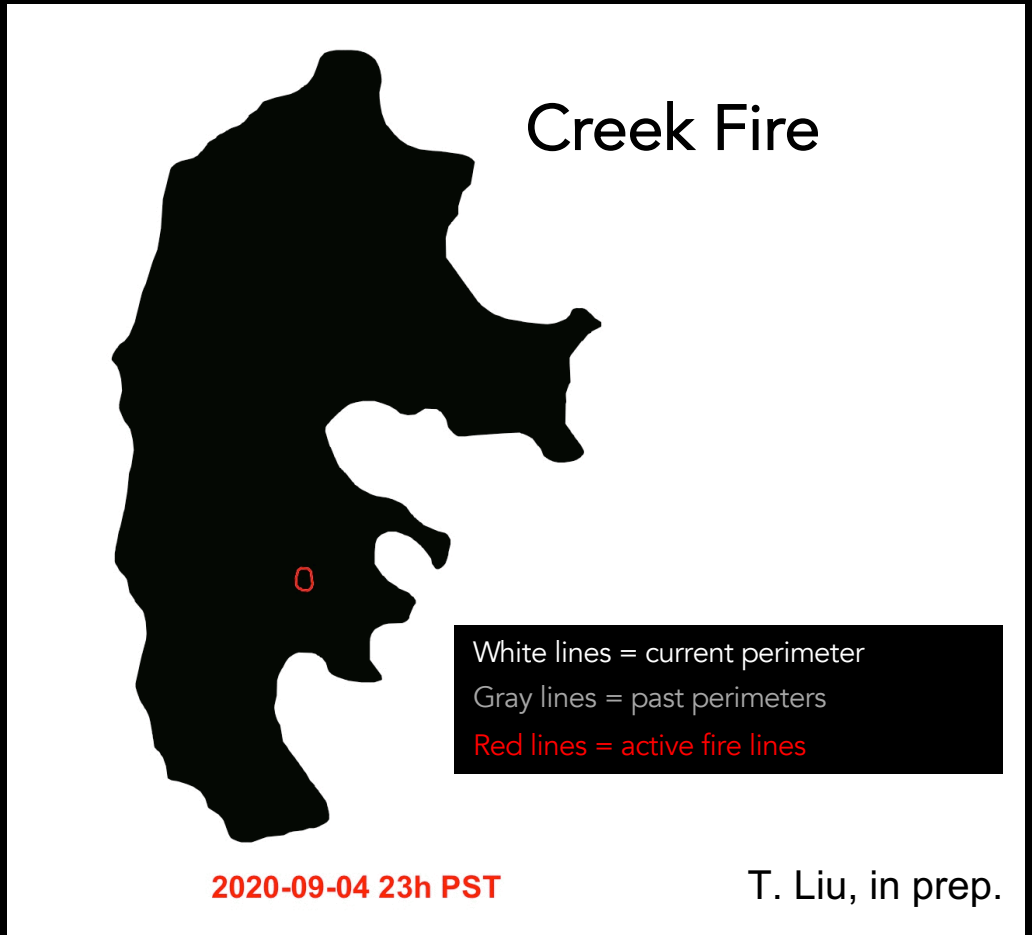
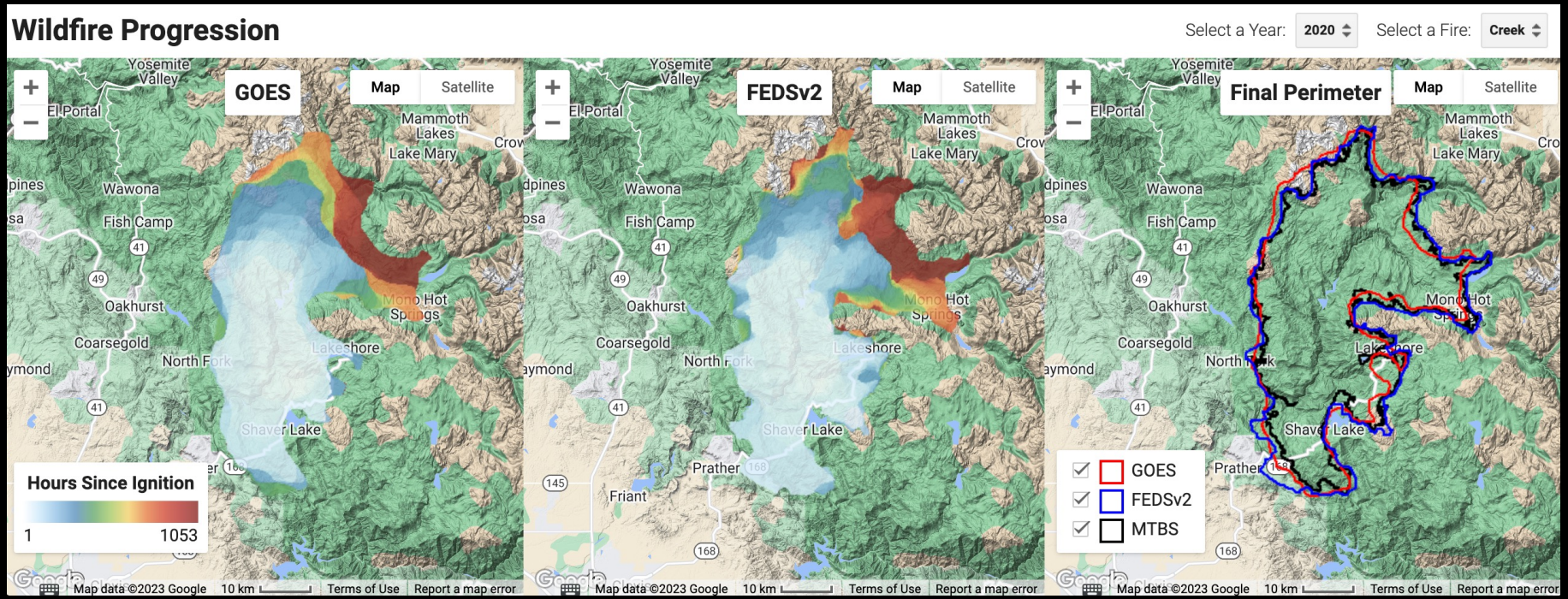
earth information system
NASA
EXPLORE EARTH
YOUR HOME, OUR MISSION
Earth Information System (EIS)
Monthly Highlights
February 2023

Hourly Fire Tracking & Emissions with GOES



Creek Fire: Fire Progression from GOES and VIIRS



GOES

Liu et al., in prep.

VIIRS

Chen et al. (2022)

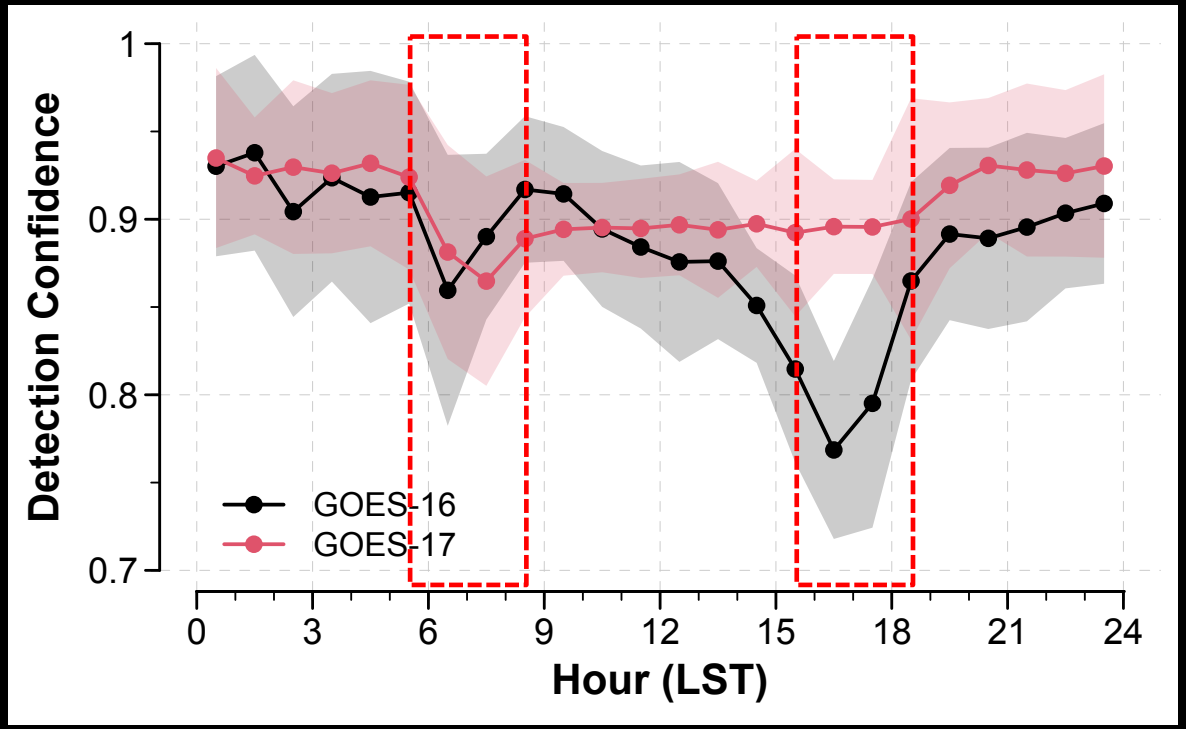
MTBS

GOES (IOU = 0.82)

FEDSv2 (IOU = 0.87)

*colors stretched from timestep = 1 to first timestep >95% of total area

Diurnal Cycle: Correcting GOES Fire Data

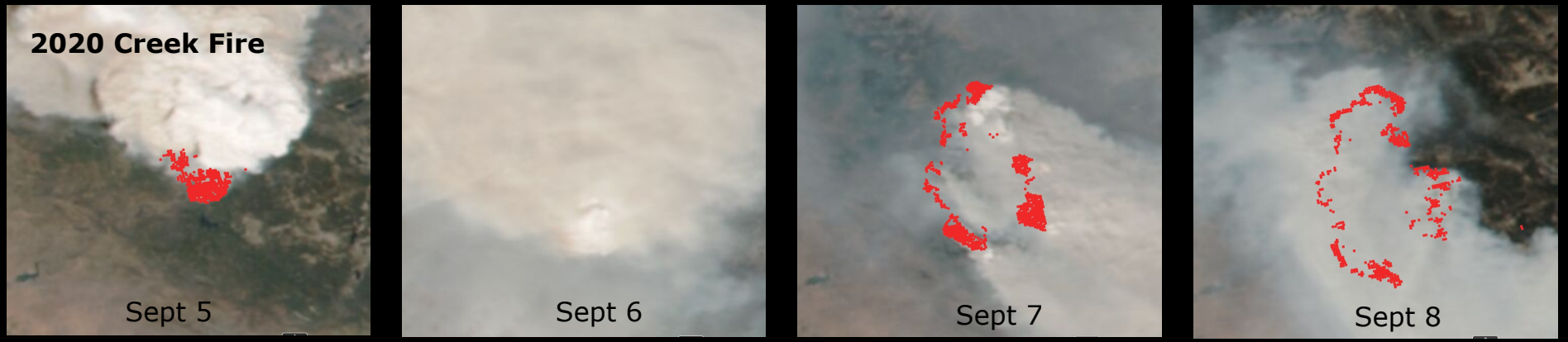


Glint rejection in the GOES Active Fire Product produces an artificial decline in detection confidence at sunrise and sunset.

EIS Fire is correcting for this error in assessments of the diurnal cycle of FRP and emissions (L. Wiggins, in prep) and fire tracking (T. Liu, in prep).

Correcting VIIRS Fire Data

The VIIRS fire detection algorithm is conservative (to minimize false detections), but this leads to an underestimate of fire activity from smoke and clouds.

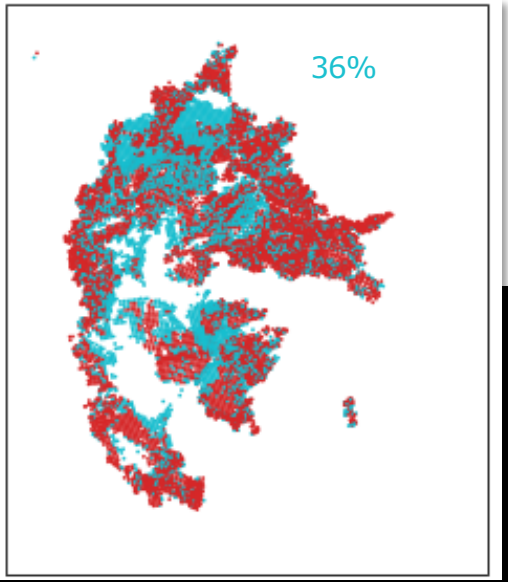


S. Coffield, in prep

Correcting VIIRS Fire Data

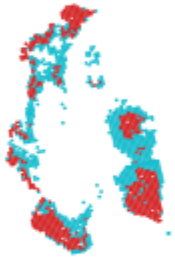
2020 Creek Fire "background" and "candidate" fires added back

Sept 5 43%



Sept 6 100%

Sept 7 55%



Sept 8 27%

S. Coffield, in prep

Candidate fires add 36% more detections over entire Creek Fire (daytime)

Adding value, upstream and downstream

- EIS Fire is directly engaging the GOES (Giglio) and VIIRS (Schroeder) active fire algorithm leads to enhance the quality of operational data.
  - Missing fire detections impact fire emissions estimates and modeled reductions in air quality from fires.
- EIS Fire is building software tools to benchmark the impact of algorithm changes on fire tracking and emissions.
  - Comparisons across scales (e.g., GOES to VIIRS) and measurement modalities (e.g., AOD, CO) provide multiple lines of evidence.
- EIS Fire is preparing the ingredients for a multi-source fire tracking capability that harmonizes GEO, LEO, and airborne data.

Greenhouse Gases

WMO GHG Symposium occurred in Geneva, Switzerland, Jan 31-Feb 1, and the IG3IS meeting followed Feb 2-3.

K. Bowman presented a poster on the GHG-EIS and gave an oral presentation on CEOS Global Stocktake–a key dataset for the GHG-EIS.

L. Ott presented on GMAO GHG capabilities used for the GHG-EIS.

GHG-EIS team members D. Jacob and J. Worden presented on CH4 results focused around multi-tiered capabilities and sectoral attribution.

GHG-EIS team supported NASA HQ (J. Kaye and K. Jucks) on a WMO recommendation for an “operational” GHG system.

We expect that GHG-EIS can play an important US contribution to a WMO GHG system through low-latency GHG information and rigorous product evaluation.

EIS Engagements in February

Organization/ Meeting	Thematic Area	Outcome
US Forest Service, National Post-Fire Program Leads	Fire + Water	Engagement on near-real time post-fire burn severity assessments using fire tracking data and Harmonized Landsat Sentinel (HLS)
VT Dept. of Environmental Conservation, Watershed Assessment Team	Water	
Interagency Post-fire Coordination Group	Fire	Situational Awareness for ongoing Post-Fire work across USG
FEMA	Fire	Revised specifications for fire tracking API
GHG Center/NASA/OMB/OSTP	GHG	Assessment of potential for EIS to provide technical infrastructure for GHG Center
WMO GHG Symposium	GHG	Presented potential of GHG-EIS to contribute to a global GHG center led by WMO.