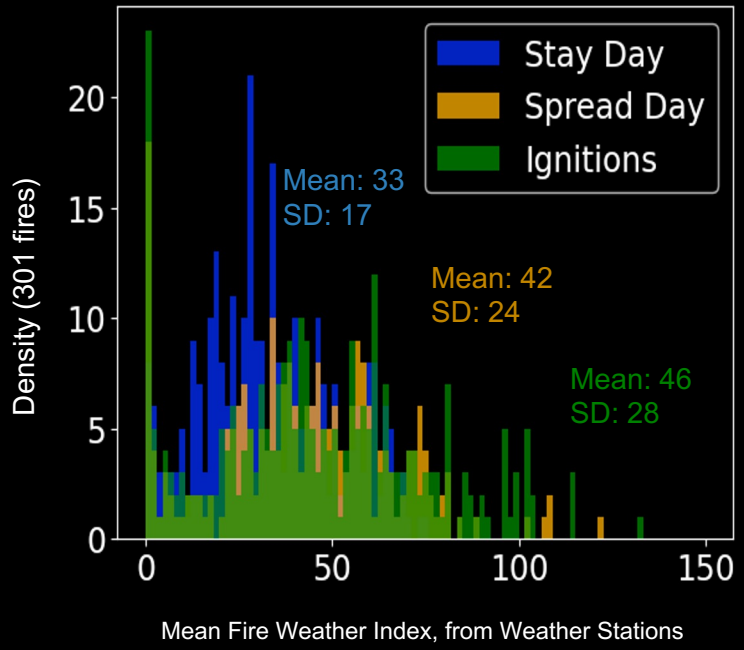
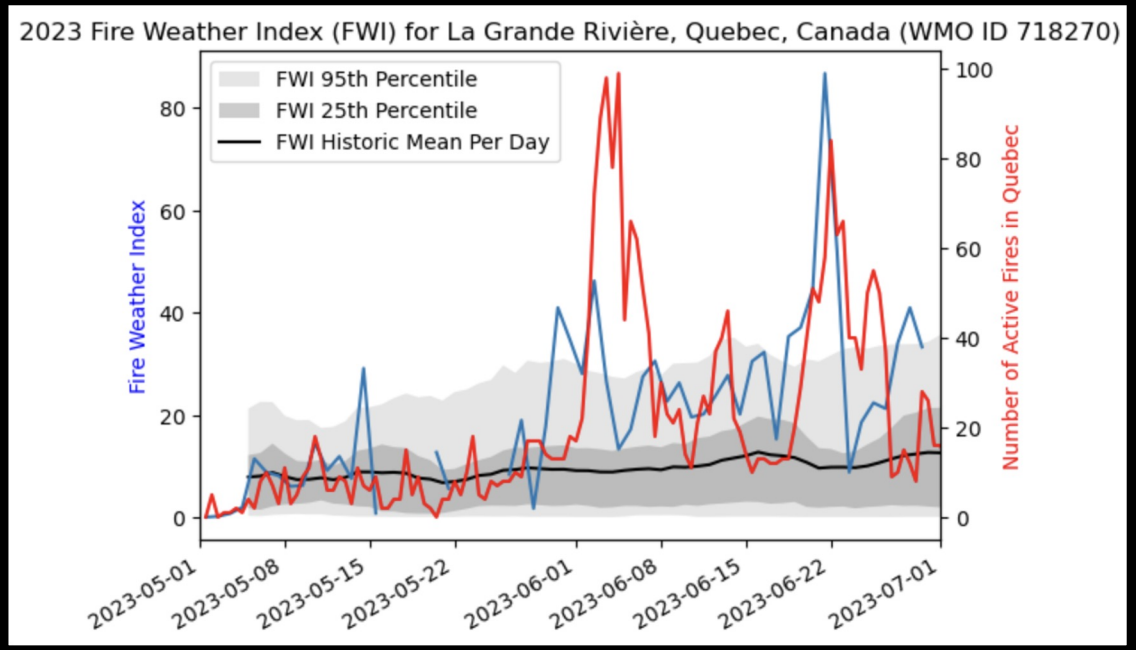

earth information system
NASA
EXPLORE EARTH
YOUR HOME, OUR MISSION
Earth Information System (EIS)
Monthly Highlights
September 2023
https://www.earthdata.nasa.gov/eis

Connecting Fire Weather to Fire Spread and Ignition

Western US, 2020 Fire Season



Canadian 2023 Fire Season



Combination of fire tracking (FEDS) and fire weather highlights how hot, dry, and windy weather promotes ignition and fire spread; fire weather outside of historical range precedes days with high fire activity.

Fire Focus: Pre-Fire, Active Fire

Partners: USFS, NRCan, Pyregence

Impact: Climate-fire relationships improve risk awareness to anticipate changes in fire behavior.

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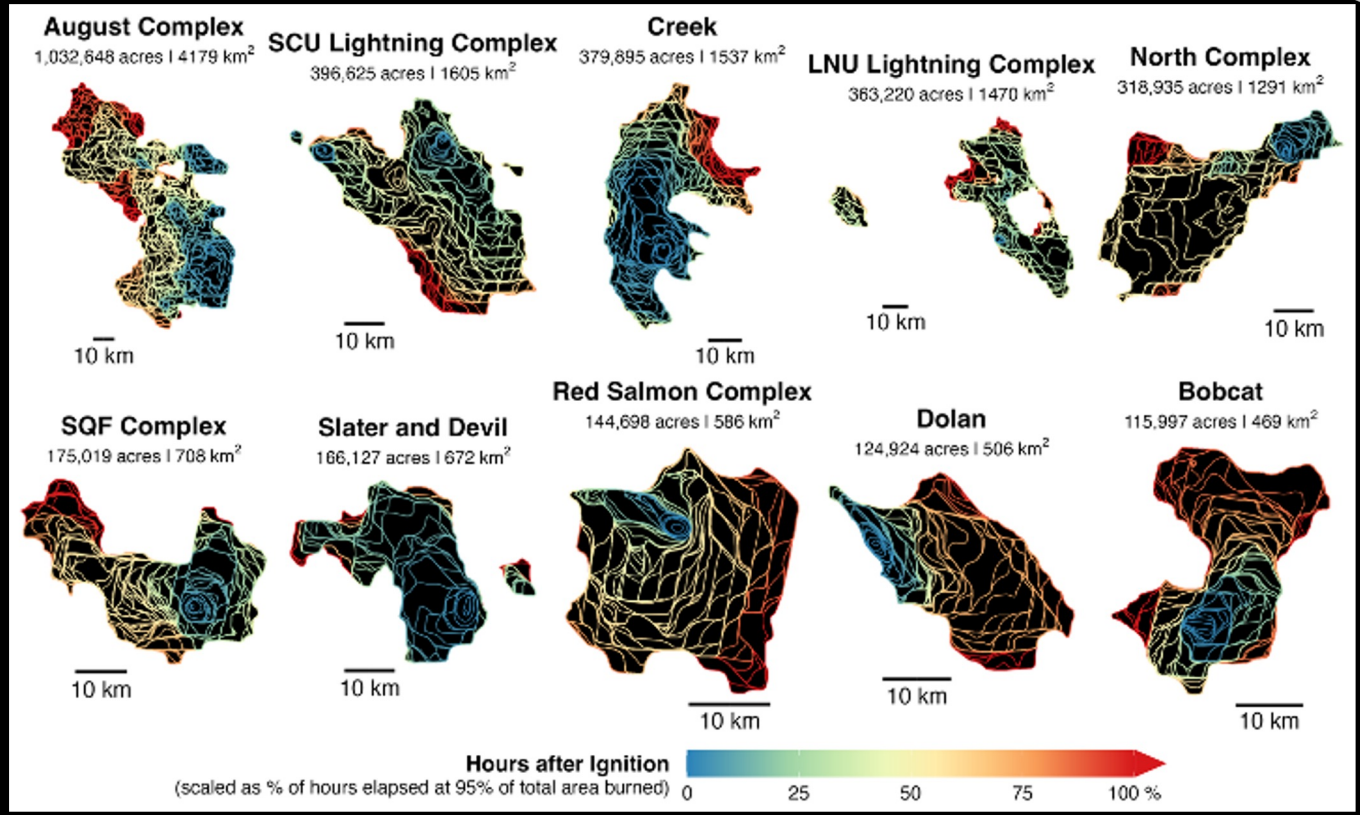
Hourly Fire Tracking with GOES:

GOES-Observed Fire Event Representation (GOFER)

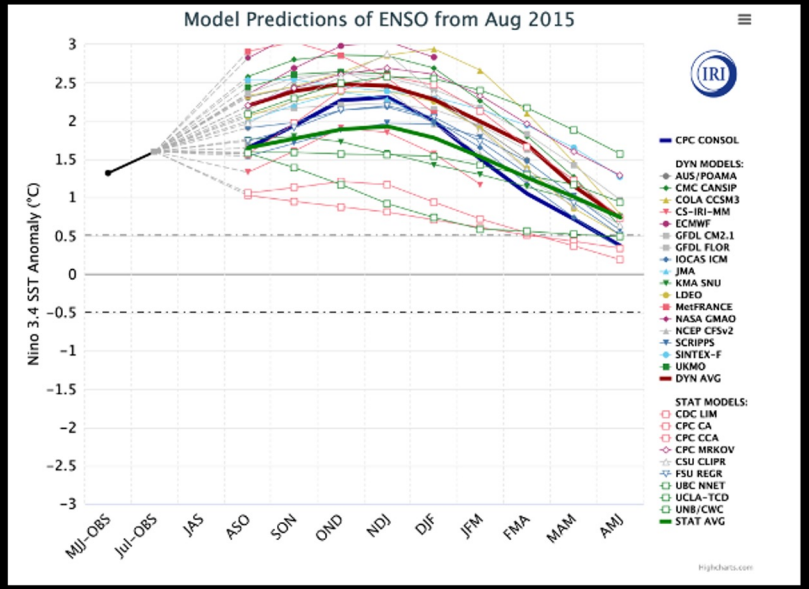
Liu et al., 2023 *ESSD*
https://essd.copernicus.org/preprints/essd-2023-389/

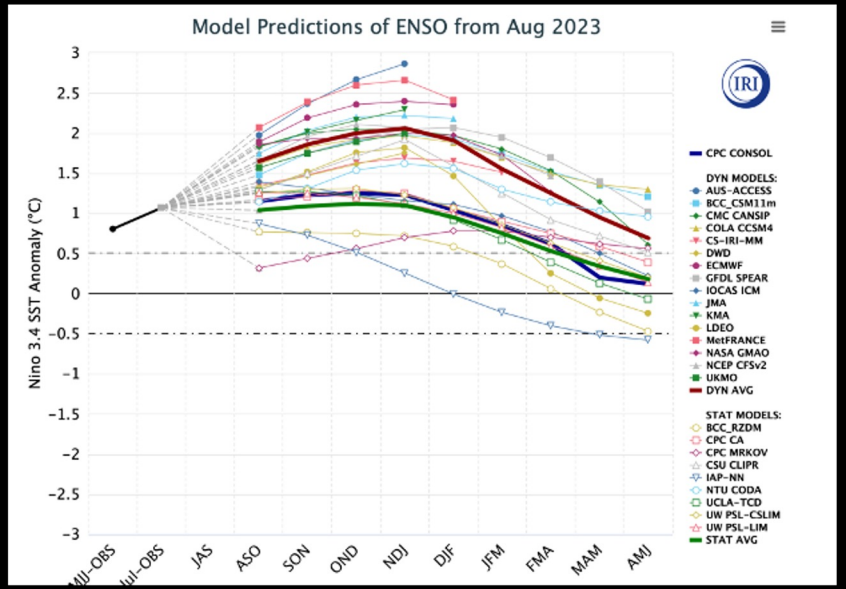


Fire Focus: Active Fire
Partners: NOAA, USFS
Impact: Improved fire tracking for periods of rapid fire spread over CONUS

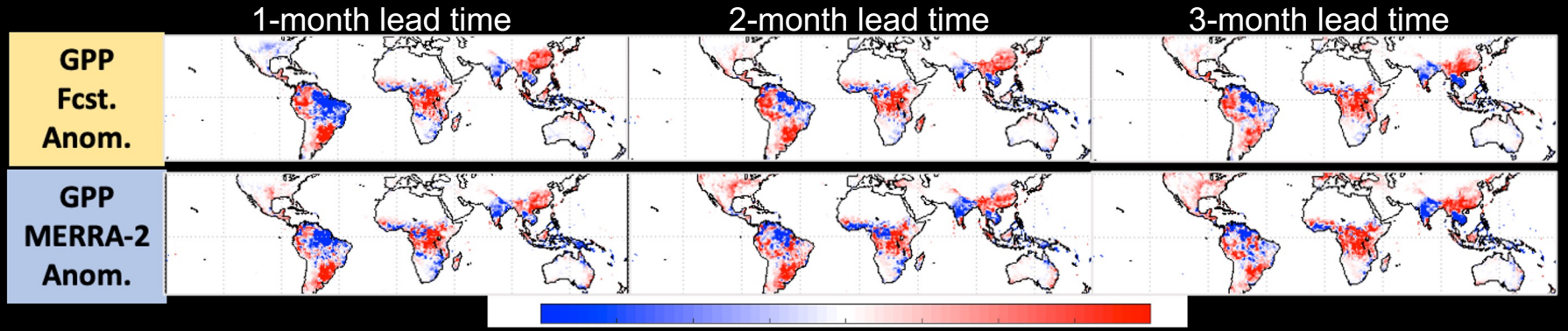
Comparison between 2015 and 2023 El Nino predictions

- The 2023 El Nino could rival the 2015 El Nino, but is complicated by historic ocean warming





Catchment-CN GPP Anomalies



- Using bias-corrected seasonal forecast meteorology to drive biosphere models
- Compare to simulation driven by reanalysis (observed) meteorology
- GPP = Gross Primary Production, amount of carbon fixed by biomass during photosynthesis
- With bias-corrected seasonal forecast meteorology, the model is largely able to reproduce the spatial pattern of GPP estimated using reanalysis data

Comparisons highlight the ability to make skillful carbon cycle predictions several months in advances, especially during El Nino events

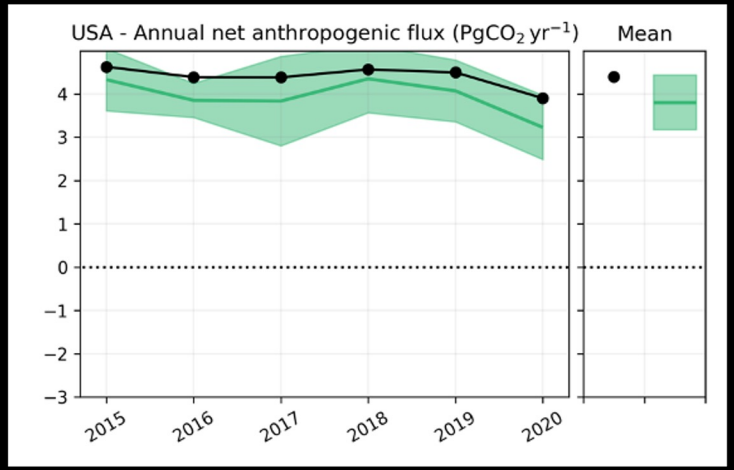
Implications of El Nino for Greenhouse Gas Inventories

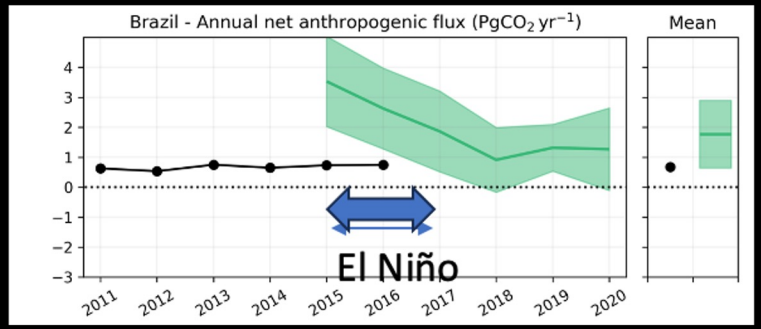
Byrne et al, Earth Sc. Data,, *2023*

- GHGI are not well-suited to handle substantial climate variability like El Nino's.
- Extreme events can complicate carbon accounting.

- GHG-EIS has integrated OCO-2 MIP.
- US and OCO-2 based estimates are consistent.
- The historic 2015-2016 El Nino released over 3 times more carbon than reported in Brazil.
- Brazil has not reported their NGHGI since 2017.

- 2023 El Nino could have unexpected impacts on GHG based upon coupling with high oceanic temperatures.
- Integrations with water and energy cycle measurements will be important for understanding response.





EIS Engagements and Outreach in September

Organization/ Meeting	Date(s)/Location	Thematic Area	Outcome
International Earth Surface Working Group	22-26 Sep/Helsinki, Finland	Freshwater	Provided insights from EIS synthesis for NWP and environmental monitoring applications
SWOT Science Team Meeting	18-22 Sep/Toulouse, France	Freshwater	Connected with French science team on SWOT data assimilation
National Academies Workshop on Greenhouse Gas Emissions from Wildland Fires	13-15 Sep/Washington DC	Fire	Provided Workshop Organization and Breakout Leads to discuss potential for reductions in fire emissions to reach net zero
Cornell University	11 Sep/Ithaca NY	Fire	Seminar: “Changing impacts from fire on climate & biodiversity in a more flammable world “
New York Times	19 Sep/virtual	Fire	Engagement with Western Wildfire Tracker visualization team about real-time FEDS data.
WMO Global Greenhouse Gas Watch - Modeling Workshop	19-21 Sep/Bonn, Germany	Greenhouse Gases	Planning for modeling intercomparisons, evaluation facilitated by WMO