Connecting Fire Weather to Fire Spread and Ignition

Western US, 2020 Fire Season

- Mean Fire Weather Index: 33
- SD: 17
- Mean: 42
- SD: 24
- Mean: 46
- SD: 28

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.
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
Comparisons highlight the ability to make skillful carbon cycle predictions several months in advance, especially during El Nino events.
Implications of El Nino for Greenhouse Gas Inventories

- 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

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