

Session 1: The Trajectory of Wildfire in the West



photo by Michelle Genberg

Mike Flannigan

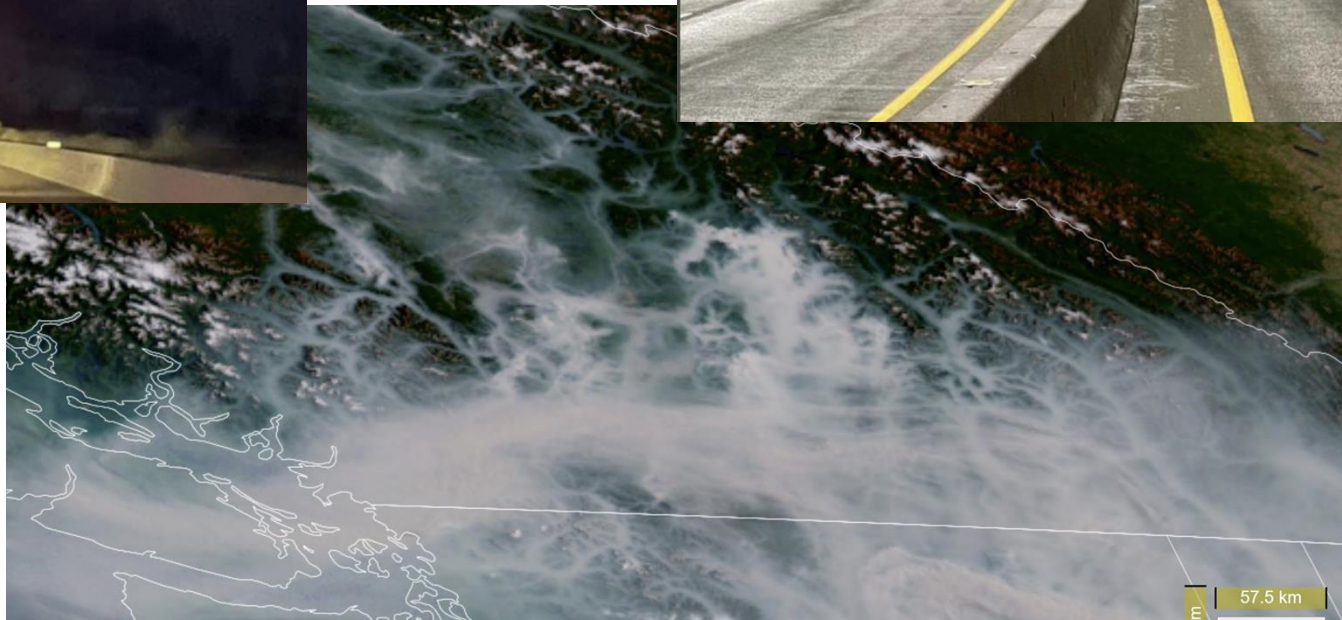
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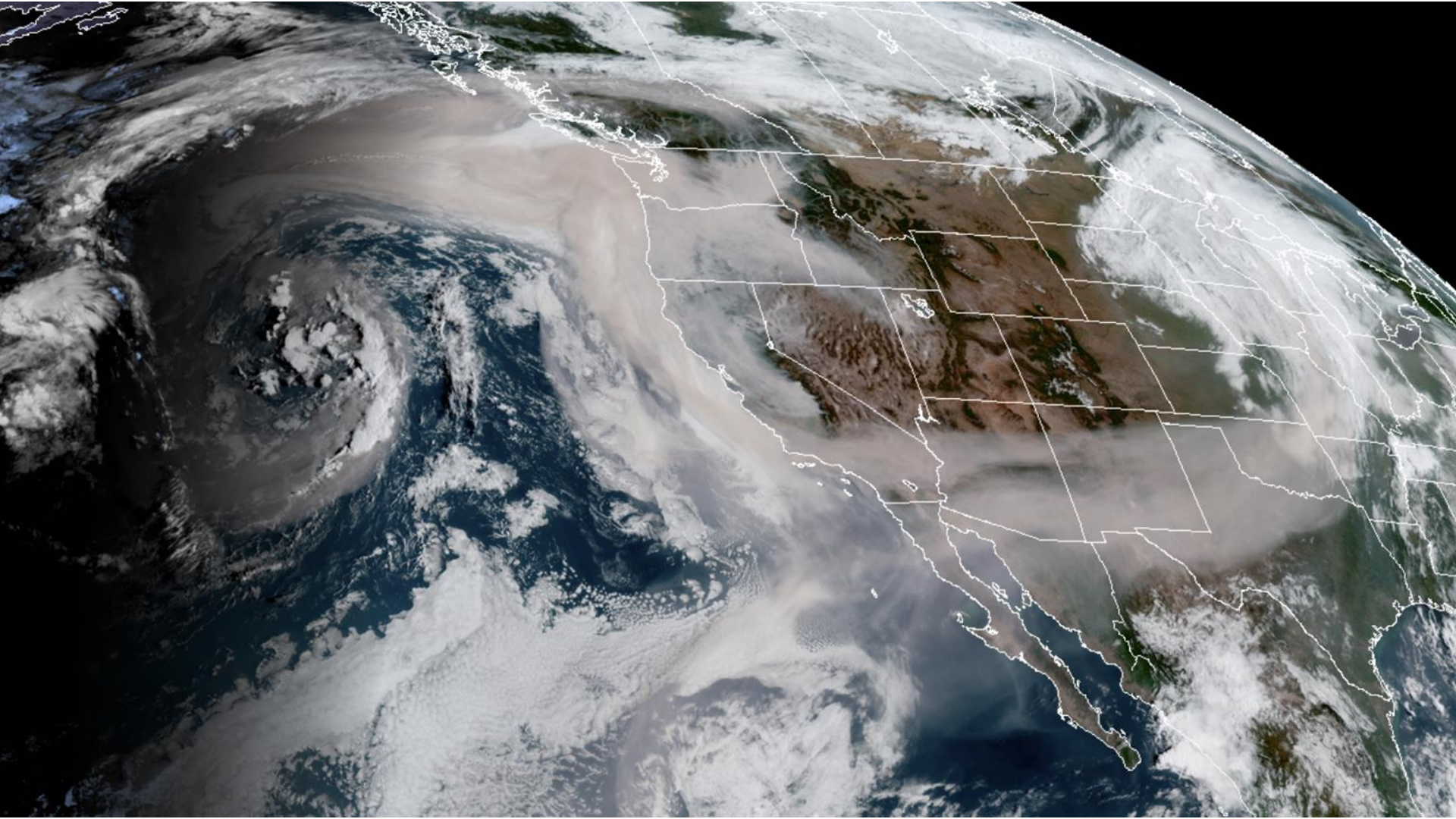
*The Social-Ecological Consequences of Future Wildfire
in the West: A Workshop – June 13-14, 2024*



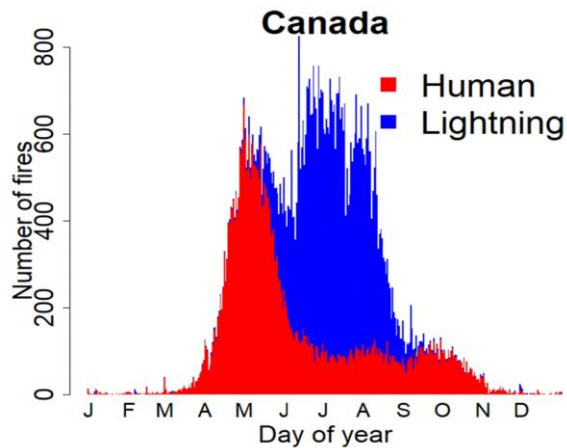
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Institute for Wildfire
Science, Adaptation
and Resiliency

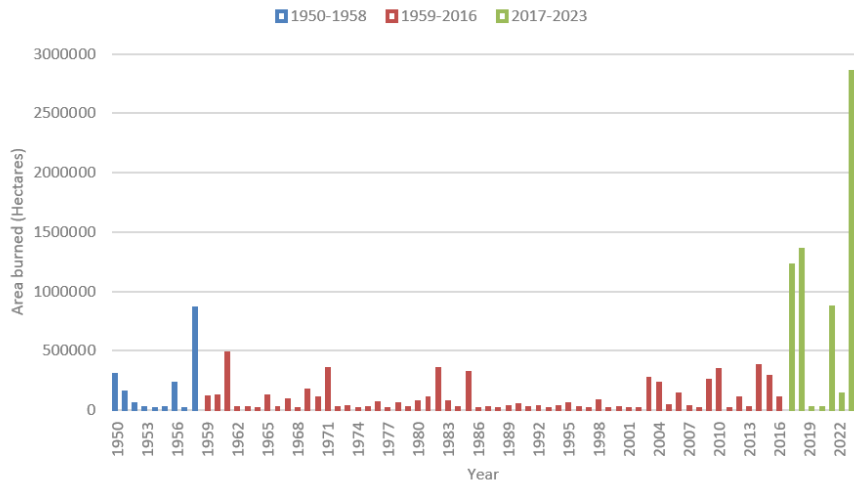




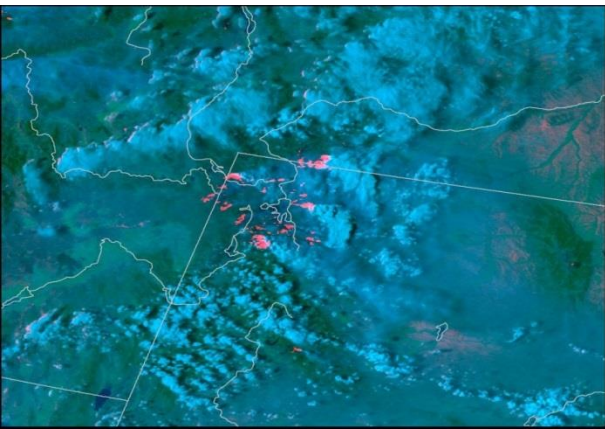
Canadian & BC Fire Statistics



BC Area Burned 1950-2023



- **Currently - average of 6,000 fires a year burn about 4 Million ha – close to a 4 x increase since the early 1970s.**
- **Often high intensity/high severity crown fires.**
- **BC - more area burned 2017-2023 than in the previous 58 years**
2023 area burned 200 times more fire than 2020
- **Area burned is highly episodic:**
 - 0.25 to ~15 million ha
- **Lightning fires:**
 - 50% of total fires (60% BC)
 - represent 90% of area burned
- **Fire size - Extremes:**
 - 3% of fires are >200 ha
 - represent 97% of area burned
 - Spread days

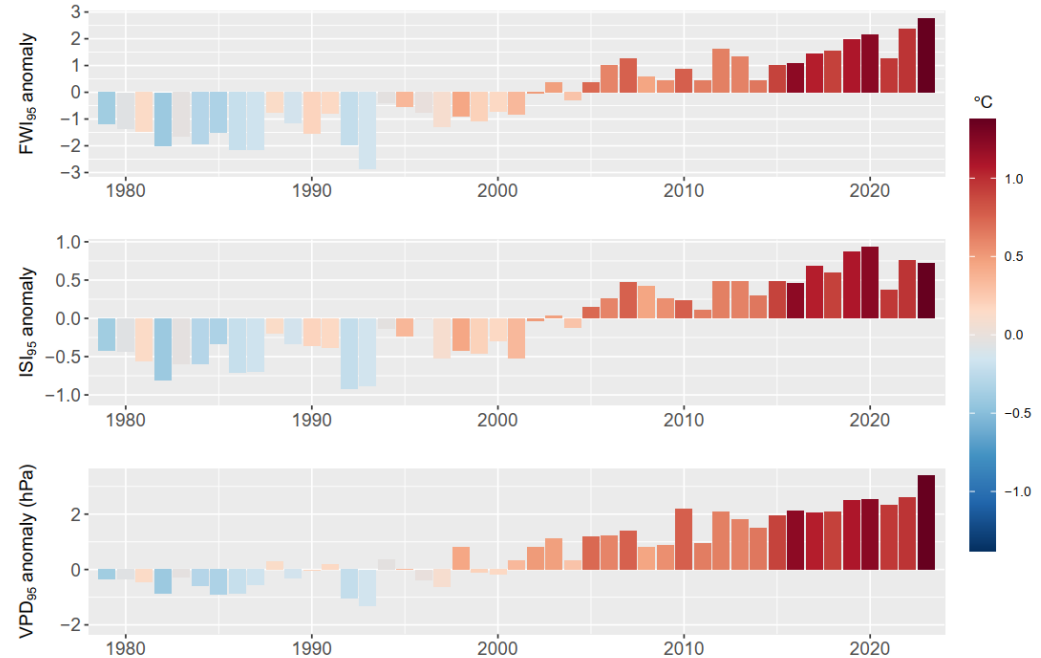
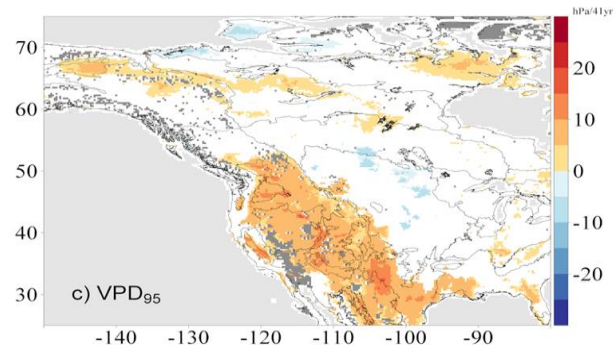
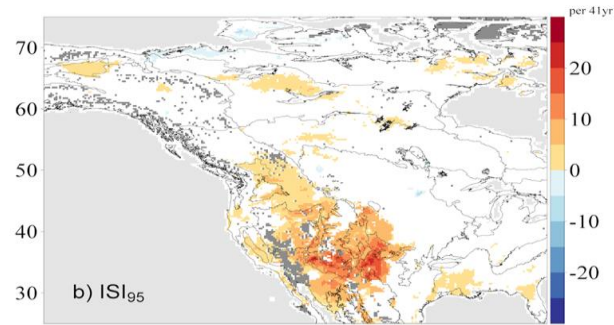
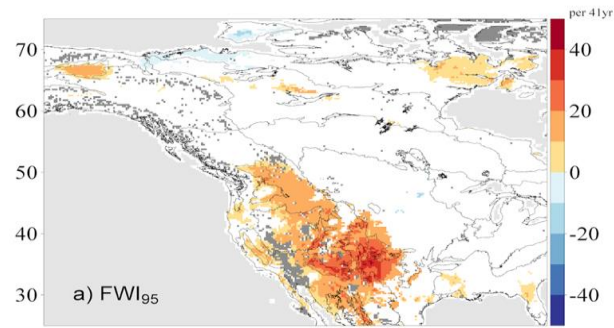


Vegetation Fires – 3 Ingredients

- Vegetation (fuel – type, amount, moisture, structure).
- Ignition - human and lightning
- Weather – hot, dry windy. Extreme weather



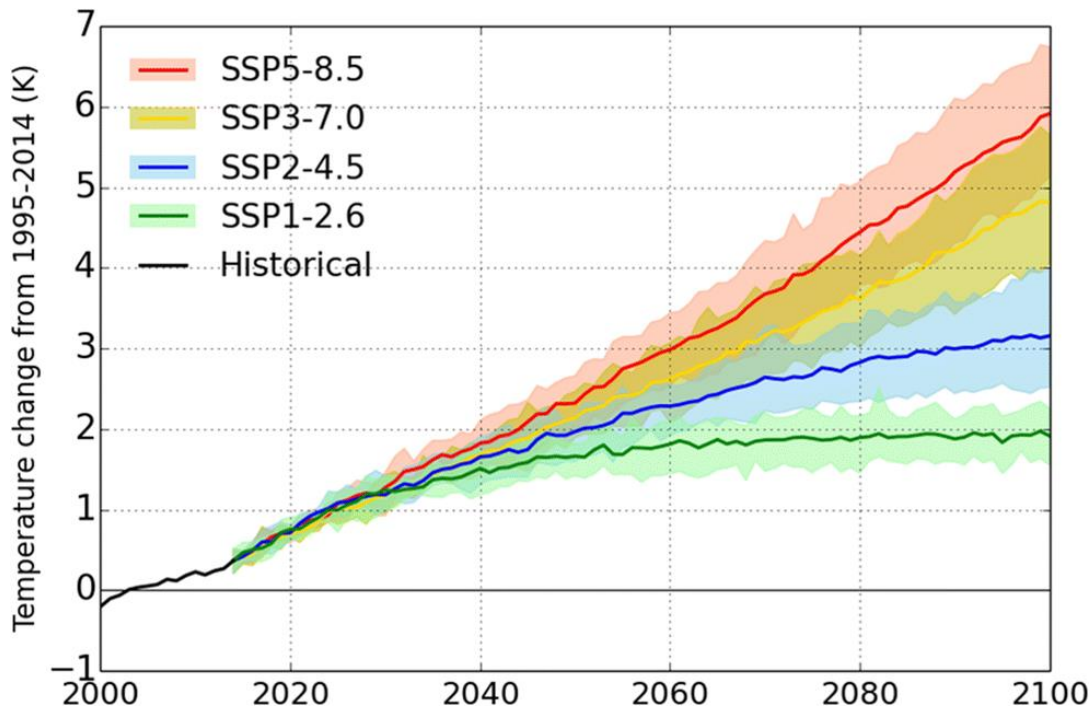
Extreme Fire Weather



Anomalies in annual (fire season) global means of extreme fire weather metrics (FWI₉₅, ISI₉₅ and VPD₉₅) between 1979-2020. All anomalies are calculated relative to the entire period 1979-2020.

Jain, P. 2021. Observed increases in extreme fire weather driven by atmospheric humidity and temperature. Nature Climate Change. <https://doi.org/10.1038/s41558-021-01224-1>

Climate Change Projections



- GCMs project up to a 6⁰ C increase in global mean temperature by 2100
- Greatest increases will generally be at high latitudes, over land and in winter/spring
- Temperature increasing as expected but impacts more severe than expected.
- Projected increases in extreme weather(e.g., heat waves, drought, floods, windstorms and ice storms)
- Spatial and temporal variability in climate change
- COP26/27/28 – move away from mitigation to adaptation

Fire & Temperature

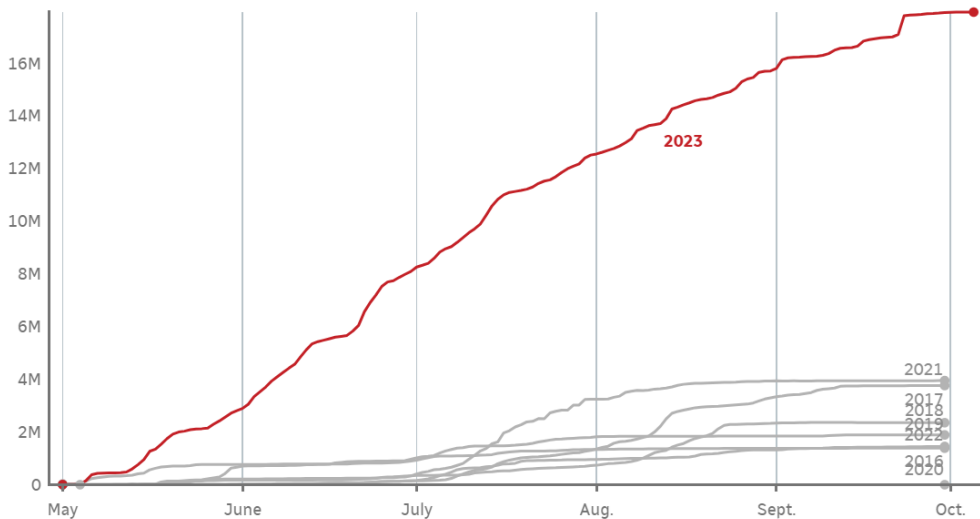


Photo credit: Government of the Northwest Territories

- **Why are warmer temperatures related to wildfire?**
- **Fire Season**
- **Lightning**
- **Drier Fuels**

The 2023 Canadian Fire Season

Estimated cumulative hectares burned in wildfires from satellite-detected hotspots



Updated on October 5, 2023 at 10:15am EDT

Source: Canadian Wildland Fire Information System (Graeme Bruce/CBC)

- Uncharted territory – area burned, geographic coverage, record breaking temperatures, atmospheric blocking, drought and extremely early start in some regions.
- Over 4% of the forest burned
- Evacuations over 200 communities and over 230,000 evacuees
- Emissions
- Expenditures in BC alone approaching 1 Billion \$

Federal data forecasts grim wildfire season this summer | CBC News

Future Wildfire

- **More extreme fire weather and regionally more fire activity in the future and our fire management approaches have to adapt to this new reality.**
- **May be entering new territory with no historical analogues. High intensity fires outside the typical fire season.**
- **Fire and society interactions will increase in the future. We have to learn to live with fire and smoke.**



Photo credit: Chris Schwarz, Government of Alberta



Future Wildfire II

- We will see higher intensity fires and more PyroCBs (fire generated thunderstorms)
- More wildfires burning into and through the night
- Fire is a multi-faceted issue and will need multi-prong approaches.



