Searching for Climate Fingerprints on Fire Weather in North America

Kaitlyn Trudeau, ktrudeau@climatecentral.org

CLIMATE CENTRAL

BACKGROUND

Climate change is increasing the frequency and severity of fire weather – hot, dry, and windy conditions – across North America. Climate Central's Climate Shift Index (CSI) is a daily temperature attribution tool that can be used to assess how much more or less likely climate change made temperatures at the place and time large fires start. Although temperature is just one of the many elements that are considered a part of fire weather, it is the variable we can most directly and accurately attribute to climate change.

METHODS

CSI was released in late 2022 so data was limited to 2023-2024. Wildfire incident data for all large (>=200ha) North American wildfires over the same period were obtained from the U.S. National Interagency Fire Center and the Canadian Interagency Forest Fire Centre. For each fire, the CSI value and average temperature anomaly (relative to 1991-2020 baseline, ERA5) were extracted at the time and place of ignition. Temperatures were considered "boosted" if they were at least 2°C above normal and made at least 2x more likely due to climate change (CSI value of 2 or above).

CONCLUSIONS

Nearly half (47%) of all large North American wildfires from 2023-2024 ignited on days when the average temperature was at least 2°C above the 1991-2020 normal and made at least 2x more likely due to climate change. While there are interesting patterns worth exploring further, more CSI data is needed to fully understand this relationship. Although many factors contribute to wildfire ignition and spread, including the conditions in the months leading up to ignition, CSI data can help shed some light on the connections between wildfire behavior and climate change.

Nearly half (47%) of all large North American wildfires over the past two years ignited on days when average temperatures were boosted – anomalously warm and at least 2x more likely due to climate change.

