

PAMIP Webinar Series

Increasing large wildfires over the western United States linked to diminishing sea ice in the Arctic

Hailong Wang

PNNL

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Or contact Lantao Sun:

lantao.sun@colostate.edu.

Abstract

The compound nature of large wildfires in combination with complex physical and biophysical processes affecting variations in hydroclimate and fuel conditions makes it difficult to directly connect wildfire changes over fire-prone regions like the western United States (U.S.) with anthropogenic climate change. Here we show that increasing large wildfires during autumn over the western U.S. are fueled by more fire-favorable weather associated with declines in Arctic sea ice during preceding months on both interannual and interdecadal time scales. Our analysis (based on observations, climate model sensitivity experiments, and a multi-model ensemble of climate simulations) demonstrates and explains the Arctic-driven teleconnection through regional circulation changes with the poleward-shifted polar jet stream and enhanced fire-favorable surface weather conditions. The fire weather changes driven by declining Arctic sea ice during the past four decades are of similar magnitude to other leading modes of climate variability such as the El Niño-Southern Oscillation that also influence fire weather in the western U.S.



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