

2.067 There's the smoke, where's the fire? A regional analysis of which fire-prone regions have the largest impact on U.S. air quality .

Early Career Scientist

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Abstract:

Wildfires represent a major challenge for air quality managers, as they are large sources of particulate matter (PM) and ozone precursors. Smoke can be transported thousands of kilometers to deteriorate air quality over large regions downwind. Under a warming climate, fire severity and frequency are likely to increase, exacerbating an existing problem. Using the National Environmental Satellite, Data and Information Service (NESDIS) Hazard Mapping System (HMS) smoke data, we identify fires that are confirmed to have produced smoke over the U.S. and Canada between 2005-2015. These smoke producing fires are the fires used to initiate the National Weather Service smoke forecast. We use these fires combined with Hybrid Single Particle Lagrangian Integrated Trajectory Model (HYSPLIT) forward trajectories, satellite detected smoke plume data, and detailed land use data to develop a climatology of the land type, ownership (public versus private), location, and seasonality of the smoke that affects each of the 9 continental Environmental Protection Agency (EPA) regions. This work offers a present-day look at the spatial and land surface distribution of fires that produce sufficient smoke to impact different regions of the country. We examine the relative contribution of local versus long-range transport to the presence of smoke in a region as well as the significance of agricultural burning versus wildfires.