



# NWCG Smoke Committee



**Clarifying NRDC's Brief "Where There's Fire, There's Smoke"**

**March 13, 2014**

Topic: In October 2013, the Natural Resources Defense Council (NRDC) published an Issue Brief entitled "Where There's Fire, There's Smoke: Wildfire Smoke Affects Communities Distant from Deadly Flames" (Knowlton, 2013). They analyzed population data and satellite derived smoke plumes (medium density and thick) from the National Oceanic and Atmospheric Administration (NOAA) fire and smoke analysis product, to identify populations affected by smoke. The brief was picked up by mainstream media (notably U.S.A. Today) and presented in their October 25, 2013 edition. While much of the brief is accurate and the NRDC should be applauded for conducting their analysis and making it public, one of the primary conclusions made does not have scientific basis. This paper clarifies the reasoning behind this conclusion and indicates that its conclusions may be overstated. **Kim Knowlton, the brief's author, was interviewed to determine the reasoning.**

***"...about two-thirds of the United States – nearly 212 million people – lived in counties affected by smoke conditions in 2011."*** Implied in the figure developed by NRDC on the next page, at some point during 2011, smoke affected much of the country. The conclusion is given further credence by the number of PM<sub>2.5</sub> monitoring stations displayed. The smoke data, however, was not obtained from the PM<sub>2.5</sub> monitoring stations, but from reviewing satellite images obtained from NOAA's Hazard Mapping System (HMS). As stated in the brief's methodology section,

*"The HMS smoke data represented the entire vertical air column and did not distinguish between smoke components at different altitudes, e.g., between smoke higher in the atmosphere versus smoke at ground level. It is reasonable to assume that the denser smoke components remain at lower altitudes."*

Unfortunately, this last statement is invalid. Dense smoke can and does remain aloft frequently downwind of large wildfires that push the smoke up thousands of feet with only minimal or no effects (other than visual) at the surface. Hence, not as many counties or people are affected by smoke as stated.

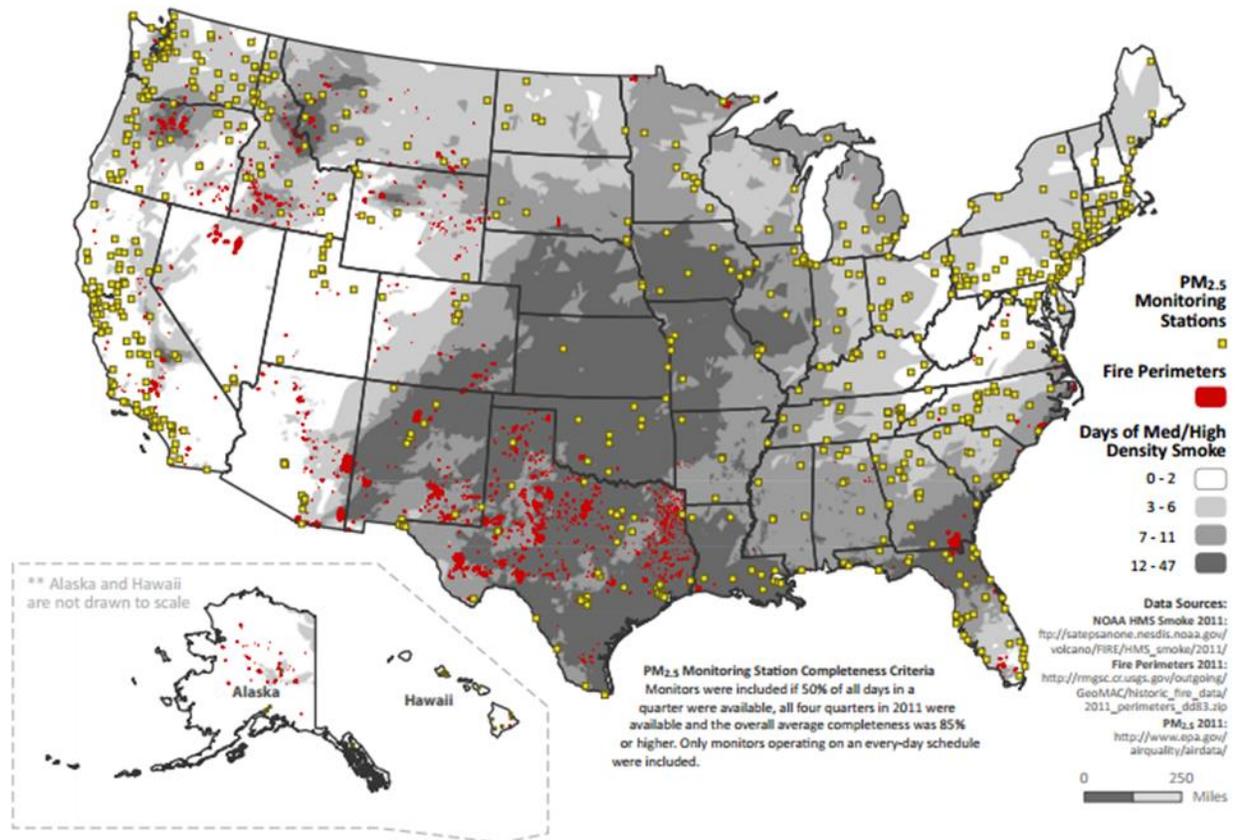
Further, the inclusion of the number of PM<sub>2.5</sub> monitoring stations is misleading. The brief emphasizes that only those stations that operated on an every-day schedule and had an overall average completeness rate of data collection of 85% or higher were included in the figure. However, none of the data from those stations are used for any of the brief's analyses, simply that they exist in those locations.

The article also does not give context to what being "affected by smoke" means. The NOAA medium density smoke plumes represent fine particulate matter (PM<sub>2.5</sub>) concentrations from 10-21 µg/m<sup>3</sup> and the NOAA thick density plumes represent PM<sub>2.5</sub> concentrations from 21-32 µg/m<sup>3</sup> (and probably greater). According to the Air Quality Index, air quality is "good" when PM<sub>2.5</sub> is 0-12 µg/m<sup>3</sup> and "moderate" when PM<sub>2.5</sub> is 12-35 µg/m<sup>3</sup>.

This is not to say that other statements in the brief have no value, nor that the rest of the conclusions are invalid. Wildfire smoke does indeed affect communities far removed from the fire itself. Steps should be taken to protect vulnerable residents "by planning for the health impacts of wildfire smoke in the face of a changing climate." However, caution should be used when referencing the numbers of people affected, the figure displaying the composite smoke across the country, or the tables presented in the brief.

## NRDC's map of smoke from U.S. wildfires in 2011

Figure 1: Smoke from Wildfires in 2011 Affected Many Parts of the United States



The smoke from wildfires travels downwind into a much bigger area than the immediate burn, possibly affecting the health of millions more Americans than the flames of wildfires alone.

Our ability to keep close track of fine-particle air pollution from wildfires as it moves downwind could be strengthened with additional daily monitoring sites or more frequent monitoring campaigns reporting on air quality conditions.

The yellow dots show monitoring sites for fine-particle air pollution (or PM<sub>2.5</sub>), one of the most health-harming components of wildfire smoke.

### Reference:

Knowlton, K., 2013. Where There's Fire, There's Smoke: Wildfire Smoke Affects Communities Distant from Deadly Flames. NRDC Issue Brief, IB: 13-09-B. <http://www.nrdc.org/health/impacts-of-wildfire-smoke/files/wildfire-smoke-IB.pdf>

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 For more information about SmoC: <http://wildfirelessons.net/> "Air Quality and Fire Issues"