Assessing the Impact of Advected African Dust on Air Quality and Health in the Eastern United States

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ABSTRACT

Large quantities of African dust are carried into the southeastern United States each summer with concentrations typically in the range of 10 to 100 µg m$^{-3}$. Because approximately one-third to one-half of the dust mass is in the size range under 2.5 µm diameter, the advection of African dust has implications for the EPA's newly implemented standard for PM$_{2.5}$ particulate matter and for the assessment of human health effects. It will be difficult to assess the impact of African dust events on air quality because they occur during the summer (maximum in July) when photochemical pollution events are frequent and intense in the eastern United States. Indeed, the presence of dust could affect the evolution of photochemical dust events. In order to assess the role of African dust in air quality in the United States, it will be necessary to develop a set of diagnostic indicators; it appears that dust mineralogy and elemental composition might be useful for this purpose. Various satellite products can be used to characterize the spatial coverage of dust events and, when coupled with meteorological tools, to predict impact regions.

Key Words: PM$_{2.5}$, PM$_{10}$

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