

## **Dust activity in the United States: from satellite detection to climate models projection**

PAUL GINOUX<sup>1</sup> AND BING PU<sup>1,2</sup>

<sup>1</sup>NOAA Geophysical Fluid Dynamics Laboratory, Princeton,  
NJ 08540, USA (paul.ginoux@noaa.gov)

<sup>2</sup>Department of Atmospheric and Ocean Sciences, Princeton  
University, Princeton, NJ 08540, USA

As one of the most abundant aerosol in the atmosphere, dust has important implications regarding climate, ocean biogeochemistry, air quality and visibility. However, there have been few attempts to detect and predict dust activity in the United States. Using spectral variation of aerosol properties retrieved from satellite data, dust can be detected at high-resolution daily and globally. The retrieved dust sources are validated by comparing their location with geomorphological data. We then perform a multiple linear regression analysis of key controlling factors of dust activity using satellite data and then use projected changes of these controlling factors from the Coupled Model Intercomparison Project Phase 5 (CMIP5) models to predict future dust activity in the late half of the twenty-first century under the Representative Concentration Pathways 8.5 (RCP8.5) scenario. Our results show that in the northern Great Plains, less dusty days will be expected in spring due to increased precipitation and reduced bareness. On the other hand, dust activity will increase in the southern Great Plains from spring to fall in the late half of the twenty-first century, largely due to reduced precipitation, enhanced land surface bareness, and increased in surface wind speed.