**Abstract**

Climate change and anthropogenic land use are altering the U.S. landscape, allowing for increases in windblown dust. These increases influence the earth system through dust’s links to radiative effects both in the atmosphere and on snow, soil fertility and desertification, and modification of cloud characteristics and microphysics. The same increases influence society due to dust’s effects on human health, visibility, and policy regarding air quality. Combining coarse mode aerosol observations from the MODIS sensor and AEORNET and IMPROVE aerosol monitoring networks, trends in dust loading from the Great Plains to the United States west coast are investigated. Trend analysis reveals strong increasing trends throughout the Great Plains and Northern Rockies reaching 5% increases in aerosol optical depth for dust observations per year between 2000-2018. Similar trends are revealed in 90th quantile coarse mode observations from AERONET and IMPROVE in the lower Great Plains region. Analysis of the Cropland Data Layer reveals between 10-20% increases in cropland coverage in many areas in the Great Plains. Positive monthly trends in IMPROVE and AERONET coarse mode 90th quantile observations during March, June, and October mirror the spatial pattern of these increases in cropland coverage and coincide with planting and harvesting seasons of corn, soybeans, and winter wheat. Additionally, using an oil and gas well dataset for federal and private lands, rapid expansion of oil and gas development during 2000-2018 is identified in Colorado, Wyoming, Montana, and South Dakota. The frequency of dust observations as observed from MODIS is positively correlated with each state’s annual frequency of wells drilled. Furthermore, these correlations spatially resemble oil and gas development in these states and trends in MODIS coarse mode observations during the same time period. These findings give a picture of an increasingly dusty Great Plains and Northern Rockies region and suggest these changes are indeed related to rapid agricultural expansion and oil and gas development. In some states and localities in this region, Environmentally Protection Agency standards on air quality are being exceeded more frequently. Locally, aerosol optical depth for 90th quantile MODIS dust observations is increasing around 1% per year between 2000-2018 in the Utah West Desert. Specifically, these increases are observed around the Sevier Lake/Desert and the Great Salt Lake drying lakebed. Increases in these regions suggest an influence from drying lakebeds on local dust loading in Utah.