Will the United States see another “Dust Bowl” soon?

Daniel Tong (CICS/UMD and GMU)
Contributed by Julian Wang (NOAA) and Dongchul Kim (NASA)

◆ The 1930s Dust Bowl (severe drought and poor land management);
◆ Observations revealed rapid intensification of dust storm activity in the western US;
◆ The Center for Diseases Control and Prevention (CDC) has reported a sharp increase in valley fever (*Coccidioidomycosis*).
◆ The confluence of drier subtropics expanded by precipitation shift, greater evaporation, less snow/ice, and earlier spring powered by warming collectively amplifies the effects of natural climatic variations to intensify seasonal or decade-long droughts, leading to future “Dust Bowl” in the Americas (*Romm, Science, 2011*).
Dust Trend and Valley Fever

- Rapid increase in dust storm activity;

Ground Monitors

- The dust trend is correlated with the Valley Fever incidences;

Dust Spatial Pattern

Valley Fever Cases

Dust Climatology

- Dust Storms

Year

- Mean PM10 Concentration (μg/m³)

NOM PM10

- IMPROVE Sites
  - Dust Sites
    - 5% Dust Sources
    - 10% Dust Sources
    - 25% Dust Sources

Map showing dust storm activity and Valley Fever cases across the United States.
Building “Dust Bowl” Prediction Capability

◆ Short-term dust forecasting capability (Tong et al., 2015);
  - Short-term dust forecasting capability (Tong et al., 2015);
  - Long-term dust storm projection;
  - Reproduce observed dust variability;
  - Assimilate satellite data;
  - Identify key climate drivers;

◆ Long-term dust storm projection;

The profound socioeconomic impacts of another Dust Bowl can easily justify investment in building dust bowl prediction capability.