

## Mineral dust - AXA Chair on Sand and Dust Storms



Sand and dust storms represent a serious hazard for life, health, property, environment and economy in many countries. Dust aerosol also plays a significant role in different aspects of weather, climate and atmospheric chemistry.

### Summary

Airborne dust, mostly emitted from soils in arid and semi-arid regions, is a key atmospheric constituent and represents an important natural source of atmospheric particulate matter. The impact of mineral dust upon climate, meteorology, ecosystems and air quality (and consequently on economic activities and human health) represents a major scientific and societal issue.

Models of dust emission, transport and deposition are used as a tool to complement dust-related observations, to understand the various aspects that control distributions and impacts of dust. While global models of the dust cycle are used to investigate dust at large scales and long-term changes, regional dust models are the ideal tool to study in detail the processes that influence dust distribution as well as individual dust events. The regional [BSC-DREAM8b](#) and the on-line multiscale MONARCH (its mineral dust module is also known as the [NMMB/BSC-Dust](#) model) are the models developed and maintained at BSC to simulate and/or predict the atmospheric cycle of mineral dust.

The MONARCH model provides operational dust forecast to the first WMO Regional Meteorological

Center Specialized on Atmospheric Sand and Dust Forecast, [the Barcelona Dust Forecast Center](#). The Center operationally generates and distributes predictions for the North Africa, Middle East and Europe region. Moreover, the model is participating in [the Regional Centre for Northern Africa, Middle East and Europe of the WMO Sand and Dust Storm Warning Advisory and Assessment System \(SDS-WAS\)](#) as well as the [International Cooperative on Aerosol Prediction \(ICAP\)](#) model intercomparison initiative.

## **Sand and dust storms (WMO)**

### **Objectives**

1. Improvement and development of sand and dust storms forecasts, predictions and reanalysis datasets.
2. Understanding and quantification of dust effects upon weather, climate, atmospheric chemistry and ocean biochemistry.
3. Assess sand and dust storms impacts upon key sectors of society and economy.

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