Capacity-Building Workshop on Sand and Dust Storm (SDS) Analysis and Modelling in the Middle East and North Africa Region

Cairo, Egypt | 16–18 December 2025

In recent years, the Middle East and North Africa (MENA) region has witnessed a significant increase in the frequency of sand and dust storms, resulting in widespread environmental, health, social, and economic impacts. Climate projections indicate that the intensity of these phenomena is likely to increase further due to the effects of climate change and land-use changes, including desertification, land degradation, and the loss of vegetation cover.

Given the transboundary nature of sand and dust storms, there is a growing need for joint analyses and coordinated regional assessments, alongside the implementation of effective strategies to mitigate their long-term impacts. This requires close cooperation among relevant agencies and institutions at both the regional and international levels.

In this context, the World Meteorological Organization (WMO) launched the Sand and Dust Storm Warning Advisory and Assessment System (SDS-WAS) in 2007, with the aim of supporting and strengthening national capacities for forecasting sand and dust storms and assessing their associated risks. The WMO Barcelona Dust Forecast Centre plays a pivotal role in coordinating research and operational activities

related to sand and dust storms, under the joint management of the Agencia Estatal de Meteorología (AEMET) and the Barcelona Supercomputing Center (BSC).

At the Gulf regional level, the National Center of Meteorology of the Kingdom of Saudi Arabia leads sand and dust storm forecasting and modelling efforts through its specialized Regional Center, relying on advanced tools and remote sensing technologies. The Egyptian Meteorological Authority (EMA) also contributes to regional capacity building through its WMO Regional Training Center, by delivering specialized training programmes in sand and dust storm monitoring and forecasting. In addition, the Cairo Numerical Weather Prediction Center plays an important research role in the analysis and modelling of sand and dust storms.

Meanwhile, the United Nations Economic and Social Commission for Western Asia (ESCWA), through its Arab Centre for Climate Change Policies (ACCCP), utilizes outputs from regional climate models developed under the RICCAR initiative—a joint United Nations–League of Arab States initiative funded by the Government of Sweden. These models constitute a key tool for supporting long-term planning and for analyzing the drivers of sand and dust storms and assessing their impacts through key climatic and environmental indicators.

As part of efforts to strengthen technical capacities, an integrated capacity-building programme has been implemented through cooperation between ESCWA and its partners. The programme included the first workshop held in Riyadh in March 2024, followed by a second workshop in Jeddah on 28–29 October 2025, which focused on the use of modern forecasting tools, early warning systems, and strengthening the integration of sand and dust storm information into climate change adaptation and disaster risk management plans.

The third workshop was held in Cairo from 16 to 18 December 2025, organized by ESCWA in collaboration with the World Meteorological Organization, the WMO Regional Training Center at the Egyptian Meteorological Authority, and the WMO Barcelona Dust Forecast Centre, with support from AEMET and the Barcelona Supercomputing Center.

The workshop aims to enhance the capacities of meteorological services in the Middle East and North Africa region in the field of surface dust analysis and modelling, in support of regional efforts to improve forecasting of sand and dust storms and reduce their environmental, health, and economic impacts. The workshop seeks to achieve the following key objectives:

- Develop the expertise of meteorological specialists to improve surface dust monitoring and forecasting processes.
- Enhance understanding and use of specialized electronic platforms that support dust monitoring and dispersion forecasting.
- Design and adapt a Surface Dust Warning Advisory System to meet the needs of different users.
- Strengthen transboundary cooperation and the exchange of expertise in joint dust monitoring and analysis.
- Reinforce institutional linkages between national meteorological services and WMO regional centers for surface dust monitoring.

- Deepen understanding of long-term surface dust trends through the use of regional climate prediction models.
- Engage meteorological experts in the use of various surface dust observation tools and technologies.
- Improve the use of Python-based programming systems to support surface dust forecasting and modelling