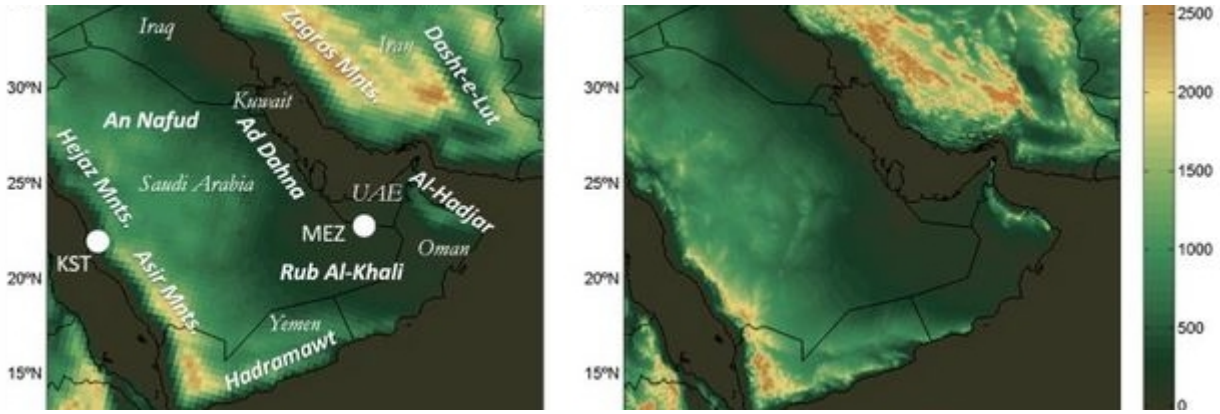
# High-resolution dust modelling over complex terrains in West Asia




The well-known scientific journal Aeolian Research has recently published the paper titled High-resolution dust modelling over complex terrains in West Asia. This paper, whose co-authors are the BSC researchers Sara Basart, Lluís Vendrell and José Mª Baldasano, focuses on the impact of the topography in the dust transport in a complex terrain region such as West Asia using the NMMB/BSC-Dust model. This is the mineral dust module of the NMMB/BSC-CTM model under development at the Earth Sciences Department of BSC.

**Abstract**: The present work demonstrates the impact of model resolution in dust propagation in a complex terrain region such as West Asia. For this purpose, two simulations using the NMMB/BSC-Dust model are performed and analysed, one with a high horizontal resolution (at 0.03° × 0.03°) and one with a lower horizontal resolution (at 0.33° × 0.33°). Both model experiments cover two intense dust storms that occurred on 17–20 March 2012 as a consequence of strong northwesterly Shamal winds that spanned over thousands of kilometres in West Asia. The comparison with ground-based (surface weather stations and sunphotometers) and satellite aerosol observations (Aqua/MODIS and MSG/SEVIRI) shows that despite differences in the magnitude of the simulated dust concentrations, the model is able to reproduce these two dust outbreaks. Differences between both simulations on the dust spread rise on regional dust transport areas in south-western Saudi Arabia, Yemen and Oman. The complex orography in south-western Saudi Arabia, Yemen and Oman (with peaks higher than 3000 m) has an impact on the transported dust concentration fields over mountain regions. Differences between both model configurations are mainly associated to the channelization of the dust flow through valleys and the differences in the modelled altitude of the mountains that alters the meteorology and blocks the dust fronts limiting the dust transport. These results demonstrate how the dust prediction in the vicinity of complex terrains improves using high-horizontal resolution simulations.

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