

6b.3 High-resolution dust source function and a case study in the NU-WRF model

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The dust emission parameterization of the GOCART model in the current community WRF-chem model is at 0.25 degree resolution and static. While the static dust source is evaluated mainly for major dust source regions, there is limitation over smaller sources such as semi-arid dust sources. In the present study we have developed a high-resolution dust source function in 1 km resolution with the surface vegetation information from the MODIS satellite. The new dust source function shows different distribution pattern and magnitude than the static source affecting smaller and vegetated source regions over South Western United States. A case study was conducted with an extreme dust storm that occurred in Phoenix Arizona in July 2011. The NU-WRF model with the new high-resolution dynamic dust source is able to successfully capture the dust storm, which was not possible in the old static sources. However, there are still many challenges in reproducing the large spatial and temporal variations of surface concentrations for this event. We will show our series of sensitivity studies that are intended to optimize the model performance, and discuss the challenges in simulating the extreme dust storm events.