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Atmospheric Chemistry and Physics Discussions

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Interactive Comment

Interactive comment on "Toward enhanced capability for detecting and predicting dust events in the Western United States: the Arizona Case Study" *by* M. Huang et al.

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Huang et al. are presenting on research that hits almost every item in the scope of ACP: chemical and physical processes using atmospheric modelling, field measurements, and remote sensing. The title clearly presents the contents of the manuscript with the subject matter of better detecting and predicting dust events being highly relevant in the scientific community today and highly needed to mitigate the deleterious societal impacts. The authors combine a multitude of relevant observational datasets available to the community to present the novel approach of improved prediction. The authors' navigation through the different datasets was a little hard to follow at times but

the presentation of the comparison between datasets and overall thoughts on inconsistencies with supported literature is helpful. The information on the data, methods, results and supplemental datasets provide the necessary path for other scientists to perform similar work. While as a reader, I wanted more out of the conclusions and suggestions, I believe this is more a reflection on the need for improvement in this research area than a lack in significance of the manuscript and the combination of these datasets available to the community is a novel and possibly necessary approach well illustrated in the results.

There are specific recommendations below that would help the reader better and more quickly understand the material:

∼Provide a summary table of the datasets (acronyms, source, data product [soil moisture; vegetation;drought; PM10; PM2.5], data input [temp & precip; satellite imagery; HiVol field measurement; modeled PM measurements]) and possibly overall conclusions/benefits/suggestions about the dataset.

∼Section 2.5 refer to the NAM model and GEOS-Chem without much explanation.

∼The introduction needs to include why stratospheric ozone in important for dust storm impact/prediction. On Lines 18 through 21 on 20760 "It's known that stratospheric ozone intrusion...." needs to be covered prior to the results (maybe just move this point).

∼Line 15 on 20755 says "impact" but does not indicate whether this is an improved impact on modeling.

∼There are a couple instances in the results where it is unclear where the authors' results end and where the literature support begin (Line 15 on 20755 and Line 18 on 20756).

Some technical issues:

∼Many figures need better explanation of the scale being presented (Fig 1a & b, 2, 3b) either in the discussion or figure caption.

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∼Figure 1 needs some clarification. I believe the numbers in the upper left hand of 1a indicate years chosen to study due to dry and wet conditions observed from analysis in 1c. It almost seems like 1c should be presented on first if that is the case and clarifying that these are indeed years and why chosen is necessary.

∼Figure 2, the purple star is not discernible.

∼Line 10 on 20747 and Line 5 on 20749 are missing "("

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 20743, 2015.