**Comparison of Meteorological-Chemistry Coupled Online Versus Offline Models in Simulating High Winter Ozone Episode in the Uinta Basin – Utah, USA.**

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**Abstract**

Recent photochemical modeling studies on high winter ozone episodes in the Uinta Basin, Utah have been unsuccessfully in capturing elevated ozone concentration. Discrepancies in emission inventories are considered as the major cause for the underestimation of ozone, however, inaccuracies in simulating meteorological parameters of inversion layers, also play critical roles in the model underperformance. The majority of earlier photochemical models simulate meteorology and chemistry in offline coupling fashion considering no feedback from chemistry to meteorology, and so far there is only one modeling study conducted by NOAA that simulates online coupling meteorology-chemistry using WRF-Chem (2-way feedback). Our preliminary tests using NOAA top-down emission inputs to run with:

* run 1: WRF-CAMx in standard offline coupling mode (WRF-CAMx) using CB6 chemistry mechanism failed to re-produce the elevated ozone concentrations.
* run 2: WRF-Chem online coupling-mode with CB05 chemistry mechanism also failed to re-produce the elevated ozone concentrations.
* run 3: WRF-Chem online coupling-mode with RACM chemistry mechanism produced elevated ozone concentrations in Uinta Basin during studied period of Jan 31st to Feb 5th, 2013.

We are investigating the reasons of differences in model performance of these three runs. Outcomes of this study serves as basis for future cost-benefit analysis for selecting best model platform for accurate simulation of high winter ozone episodes in the Uintah Basin.