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Health impact calculations in CAM-chem: The effects of model resolution on exposure

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Based on the latest Global Burden of Disease report poor chronic exposure to ambient air quality is responsible for around 4.2 million global premature deaths annually and linked to a number of other adverse health impacts from acute exposure. Therefore, estimating exposure to health-relevant pollutants, particularly ozone and $PM_{2.5}$, has been a recent research focus of the air quality community. This has been done using a range of models and methods although the interactions between climate and air quality are often not captured since simulations at exposure-relevant scales often use chemical transport models due to the computational cost of fully-coupled chemistry-climate models. This work shown here will show results from the newly developed CAM-chem-SE-RR, a global climate model with regional refinement over the contiguous United States. In particular, I will show the differences in estimated population-weighted $PM_{2.5}$ and ozone at various scales ranging from continental to metropolitan with a number of scale-relevant assumptions for the model inputs, in this case the temporal and spatial resolution of emissions. This work shows that the regional sources of emissions are a large source of uncertainty in modeled estimates of health-relevant pollutants, especially for acute concentrations highlighting the need to account for climate feedbacks when considering the health impacts for populations that are vulnerable to respiratory illnesses.

Monday, July 15, 2019, 3:30 p.m
Refreshments 3:15 p.m
NCAR Foothills Laboratory
3450 Mitchell Lane, Boulder, CO 80301
FL2-1022, large seminar room
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