

ACOM Seminar

Forcing by Fossil, Fire, Food & Forest Fluxes: How Field Observations Guide Climate Policy?

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Links: <https://operations.ucar.edu/live-acom>

ABSTRACT

Anthropogenic greenhouse gases and aerosols alter the Earth's radiative balance and trigger feedbacks that are idealized, scaled and approximated in Earth system models. This talk will discuss field observations at multiple scales of the properties of light absorbing aerosols from wildfires as well methane and carbon dioxide fluxes from the Amazon forest and human fossil and food activities. The speaker will highlight the process level understanding we have gained to inform the following model parameterizations:

1. Radiative forcing by mixed light absorbing black and brown carbon from wildfires,
2. Methane and ethane fluxes from dairies and oil and gas exploration, and
3. Seasonal to daily carbon-climate model responses in the Amazon rainforest.

Results will be used to understand and help rectify biases in models. I will discuss Pyrocumulonimbus injections of large amounts of smoke into the stratosphere and their climatic consequences. Finally, the power of top down observational records in evaluating and refining climate model development, particularly the role internal variability and secular human radiative forcing and potential tipping points in the Arctic will be highlighted.