Geophysical Research Abstracts
Vol. 21, EGU2019-17250, 2019
EGU General Assembly 2019

Sensitivities to emission representation in determining air-quality, radiative-transfer and health effects of residential solid fuel in South Asia

Tami Bond (1,3), Nicholas Lam (2), Luke Conibear (3), Dominic Spracklen (3), Ed Butt (3), Stephen Arnold (3), Leighton Regayre (3), Ken Carslaw (3), and Jill Johnson (3)

(1) University of Illinois at Urbana-Champaign, United States (yark@illinois.edu), (2) Humboldt State University, United States , (3) University of Leeds

Solid-fuel burning is responsible for a large fraction of carbonaceous aerosol emission, ambient air pollution, mortality, and aerosol-climate forcing in South Asia. These major human and atmospheric impacts have motivated proposals for mitigation by switching to cleaner fuels that provide the same service. Many simplifying assumptions are made in modeling these benefits of these mitigation strategies. We investigate which of these assumptions are most important to determining impacts, using a new service-based emission inventory with high spatial resolution and size-resolved particulate emissions, a regional model (WRF-Chem) for pollutant transport and health impacts and a global model (GLOMAP). We present advances in representation of spatial constraints on liquid-fuel distribution networks that govern emission locations, and realistic distributions of particle size at emission. In an evaluation of sensitivity, we compare modeled particle concentrations, health impacts, and direct and indirect radiative forcing with those modeled using standard assumptions. This comparison identifies the factors that most need constraint to gain confidence in the benefits of mitigation.