

HAQAST Research at UNC

J. Jason West

Department of Environmental
Sciences & Engineering
University of North Carolina,
Chapel Hill



Global Surface Ozone Concentrations

Goal: Estimate global surface ozone concentrations by statistically fusing global ozone observations and an ensemble of global models.

Stakeholder partners: Global Burden of Disease Assessment – Michael Brauer (UBC), Rick Burnett (Health Canada), Bryan Hubbell (EPA).

Team: Jason West, Marc Serre (UNC), Owen Cooper, Kai-Lan Chang (NOAA)



Global Air Quality and Health Co-benefits of Paris Agreement Pledges

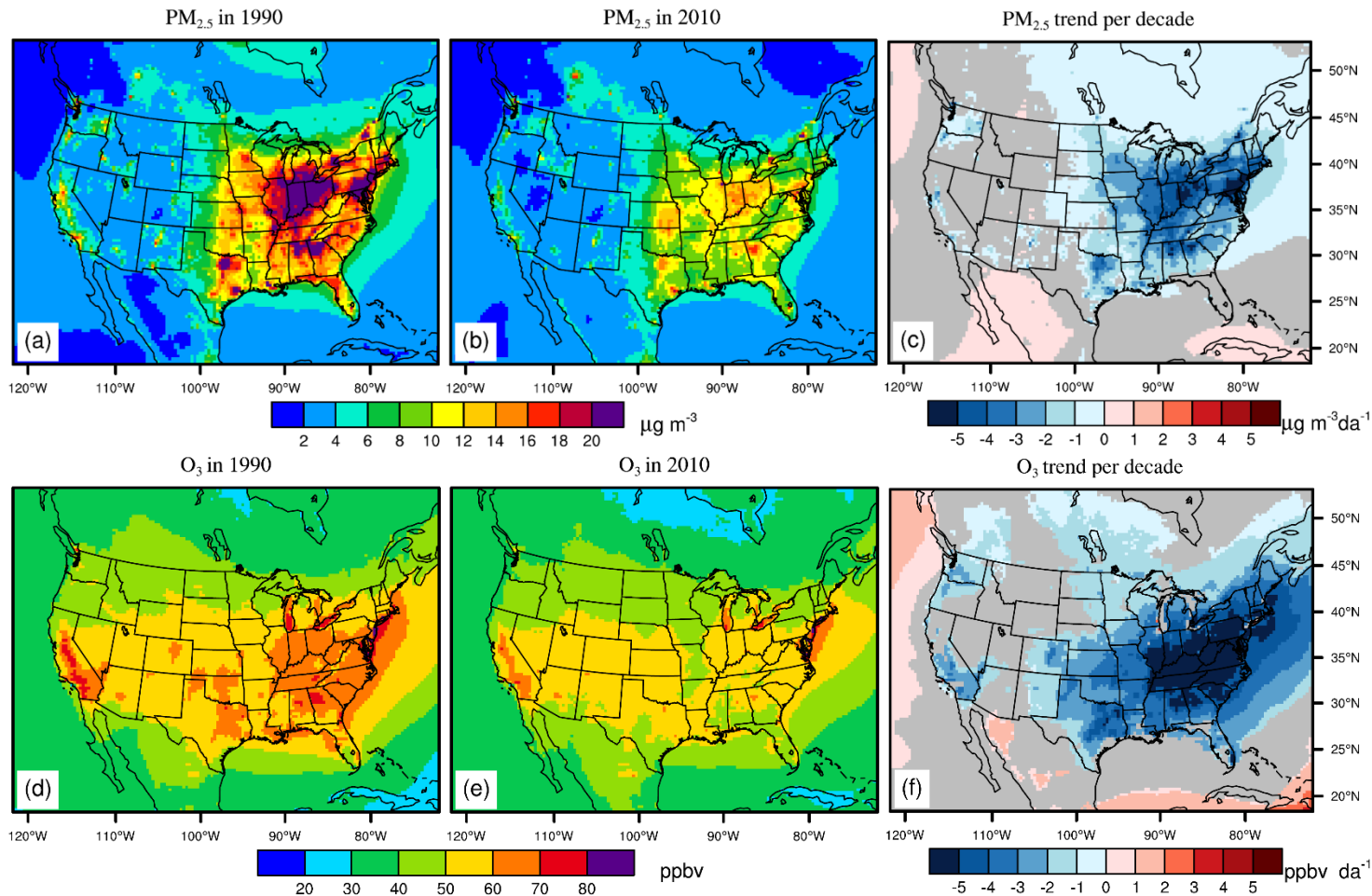
Goal: Model the global air quality and health co-benefits of greenhouse gas emission reductions currently pledged under the 2015 Paris Agreement

Team: Kathleen Mulvaney, Jason West (UNC), Steve Smith (PNNL/Maryland)

Approach:

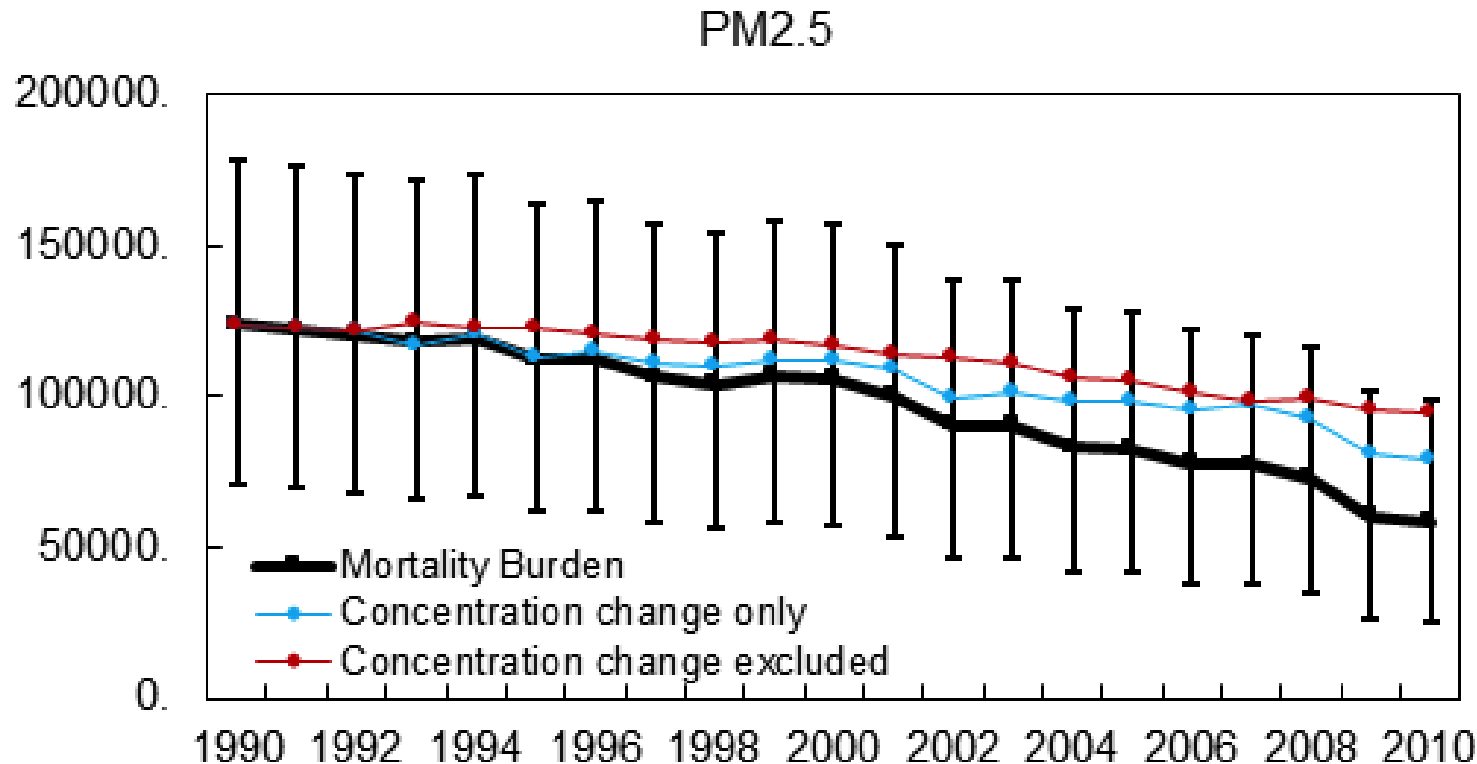
- Paris Agreement pledges have been modeled in the global energy-economics model GCAM.
- We will model time slices for 2030, 2050, 2100, for a few scenarios.
- CAM-chem and GBD health impacts methods.

US air pollution trends 1990-2010



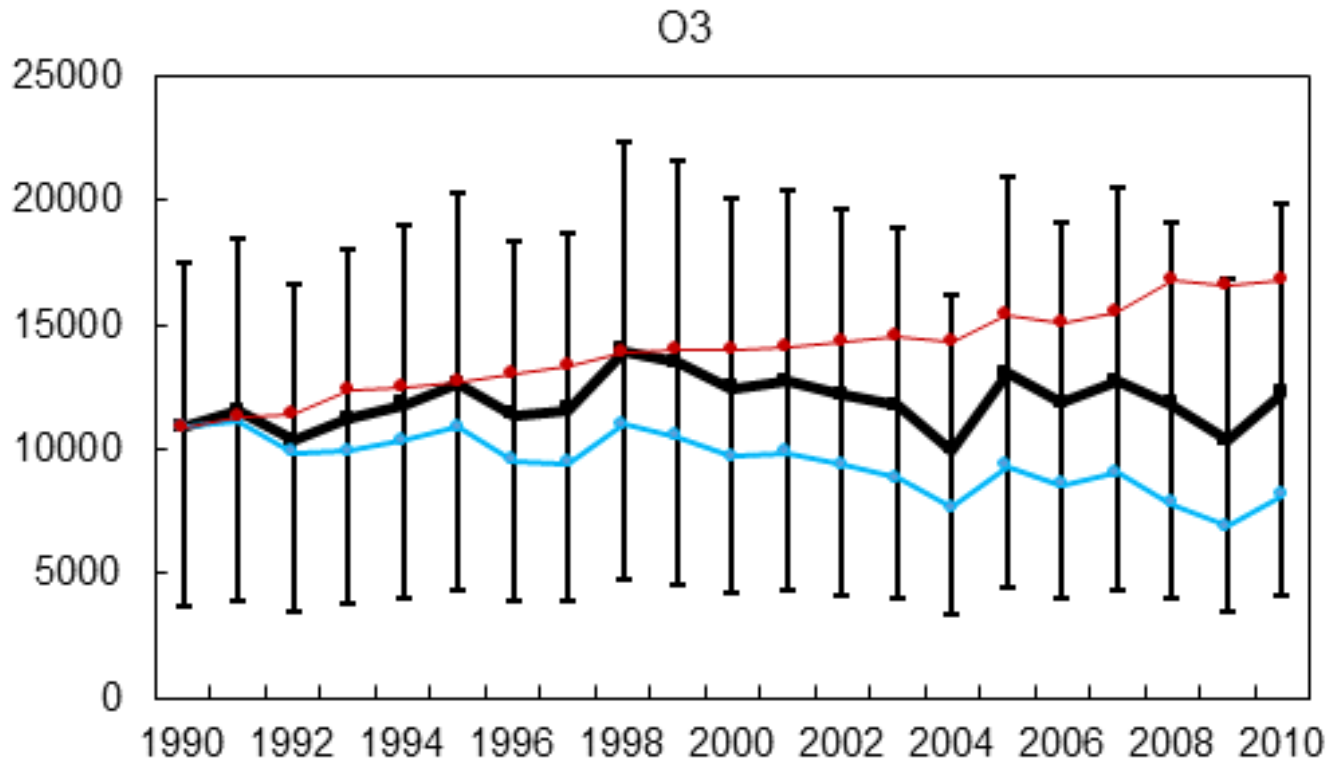
Results from a 21-year CMAQ simulation by the EPA
(Gan et al. 2015; 2016)

PM_{2.5} mortality trends 1990-2010



- PM_{2.5} mortality decreased by 53% from 123,700 (70,800-178,100) deaths in 1990 to 58,600 (24,900-98,500) in 2010.
- Without the decrease in PM_{2.5} since 1990, the burden would have only decreased by 24%.
- PM_{2.5} reductions since 1990 have decreased deaths in 2010 by about 35,800.

Ozone mortality trends 1990-2010



- Ozone mortality increased by 13% from 10,900 (3,700-17,500) deaths in 1990 to 12,300 (4,100-19,800) in 2010.
- Without the decrease in ozone since 1990, the burden would have increased by 55%.
- Ozone reductions since 1990 have decreased deaths in 2010 by about 4,600.