

HPC-Biostatistics-PFRH Co-Sponsored Seminar
Probabilistic Projection of Carbon Emissions



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Dr. Raftery is also a faculty affiliate of the Center for Statistics and the Social Sciences and the Center for Studies in Demography and Ecology. He works on the development of new statistical methods for the social, environmental and health sciences. He is an elected member of the U.S. National Academy of Sciences.

Abstract

The Intergovernmental Panel on Climate Change (IPCC) recently published climate change projections to 2100, giving likely ranges of global temperature increase for each of four possible scenarios for population, economic growth and carbon use. We develop a probabilistic forecast of carbon emissions to 2100, using a country-specific version of Kaya's identity, which expresses carbon emissions as a product of population, GDP per capita and carbon intensity (carbon per unit of GDP). We use the UN's probabilistic population projections for all countries, based on methods from our group, and develop a joint Bayesian hierarchical model for GDP per capita and carbon intensity in most countries. In contrast with opinion-based scenarios, our findings are statistically based using data for 1960-2010. We find that our likely range (90% interval) for cumulative carbon emissions to 2100 includes the IPCC's two middle scenarios but not the lowest or highest ones. We combine our results with the ensemble of climate models used by the IPCC to obtain a predictive distribution of global temperature increase to 2100. This is joint work with Dargan Frierson (UW Atmospheric Science), Richard Startz (UCSB Economics), Alec Zimmer (Upstart), and Peiran Liu (UW Statistics).

12:15-1:30 pm
Wednesday, October 3, 2018
Paige Hall (W2030)
Bloomberg School of Public Health
Johns Hopkins University