Biosphere-atmosphere interactions: prioritizing strategies for air quality, agriculture and public health under global climate change

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Abstract
Global environmental change affects many aspects of our everyday life including the air we breathe and the food we eat. For instance, climate change influences human health by modifying the frequencies of air pollution episodes and heat waves. Climate change and air pollution together substantially impact agricultural productivity, thus threatening global food security. Anthropogenic changes in ecosystems in turn affect both air quality and climate. A realistic assessment of these impacts is crucial for sustainable planning, but it also requires a better understanding of the complex interactions between climate, atmospheric chemistry, and the biosphere. In this talk, we will show how a combination of statistical and process-based computer models enables us to examine various facets of biosphere-atmosphere interactions, allowing us to predict the individual and combined effects of different environmental changes and thus inform policy formulation. Particular attention will be paid to how an integrated system approach allows us to prioritize strategies concerning air pollution control, food security, land use, and climate change management.