Understanding the role of spatial and temporal scale on biosphere-atmosphere interactions

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Abstract

The exchanges of mass, energy and momentum between the earths surface and the atmosphere are vary across both space and time. These exchange processes are highly non-linear, yet prediction is vitally important for assessing and mitigating the potential impacts of climate change. Here, we examine the role of spatial and temporal scale on exchanges of water, carbon, energy and momentum using a variety of surface and satellite observations and modeling approaches. In particular, we examine issues related to water and carbon cycling during drought conditions, the impact of spatial resolution of observational systems on determination of fluxes, the role of land surface heterogeneity on boundary layer fluxes and the impact of land cover decisions on such processes as urban heat islands and renewable energy extraction.