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**The effects of aerosol water on regional climate change in the southeastern United States**

Temperatures in the southeastern United States have been cooling over the past 100 years, contrasting with trends in different parts of the country. To better understand this phenomenon, we investigate the spatial and temporal trends of particle-phase liquid water, an aerosol constituent that can impact 1) atmospheric aqueous chemistry through effects on gas/particle partitioning, 2) human health through effects on aerosol size distribution and composition, and 3) climate change through effects on radiation scattering and cloud-forming properties. Aerosol water concentrations were modeled using the inorganic thermodynamics model ISORROPIA v.2.1, while field measurements were conducted using a Scanning Mobility Particle Sizer system at Talladega National Forest from June 3 – July 15, 2013. Modeling results suggest that aerosol water is highest in the eastern U.S., and peaks in concentrations during the summertime. The latter is consistent with recently noted high summertime aerosol optical depth in the region, which may possibly induce regional cooling. Meanwhile, field data indicate that hygroscopic growth factors follow a diel cycle and exceed 2 from 7-9AM local time. An in-depth knowledge of aerosol water in the atmosphere ultimately improves the understanding of biosphere-atmosphere-climate interactions, yielding more informed and accurate model predictions for climate and air quality.