

ATS/CIRA Colloquium

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Hosted by Maria Rugenstein

3 p.m. Thursday, August 31

ATS 101 and Zoom

Land surface controls on the near-surface climate

The coupling between land and atmosphere influences the near-surface climate. However, the role of the land surface varies spatially, and it is often difficult to disentangle the coupled interactions. In this talk, I will present recent work out of my group that aims to improve our understanding of changes in the near-surface climate due to land-atmosphere interactions. First, we explore the impact of a uniform change in a single land surface property, evaporative resistance, on daily summertime temperature. The uniform change causes large, spatially variable (in both direction and magnitude) changes in temperature variance that can largely be explained through the surface energy balance. We next leverage the surface energy balance to understand the full spatiotemporal pattern of tropical warming in response to increased CO₂, which is influenced both by the climatological partitioning between sensible and latent heat fluxes, and the changes to that partitioning. Finally, we note that, while the surface energy balance suggests a strong relationship between temperature and humidity, there has been limited work on observed changes in continental humidity. In contrast to expectations, specific humidity has been decreasing in the US Southwest, especially on hot days, likely due to moisture limitations from the land surface.

Colloquia page: atmos.colostate.edu/colloquia