

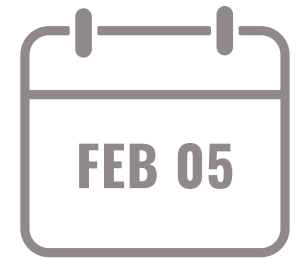
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The Physics of High CAPE

Severe convective storms are a significant source of weather-related losses and injury, worldwide. Yet very little is known about what sets their climatology in the current climate, and why climate models generally indicate increased severe storm activity as the climate warms. I will focus on one of the main ingredients in severe convective storms: Convective Available Potential Energy (CAPE). The global climatology of CAPE differs significantly from that of deep convection in general. Using both an observational analysis and a 1-D model coupled to a model of soil and vegetation, I will argue that high CAPE results when air masses that have been significantly modified by passage over dry, lightly vegetated soils are advected over moist soils with moderate to extensive vegetation. This suggests that widespread agricultural practices may significantly modify the climatology of severe convection and points to how climate change might affect the prevalence and intensity of severe convective storms.