UNIVERSITY AT ALBANY
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Colloquium

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Drought Under Global Warming

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3:00 p.m. in Social Sciences 256
(tea & coffee at 2:40 p.m.)

Abstract. Drought is among the most damaging natural disasters, causing billions of dollars in economic losses each year in the U.S. alone. Recent widespread droughts in the western U.S. have highlighted their severe damages through water shortages and wildfires. One major impact of anthropogenic warming is increased risk of drought. Climate models project drier land surfaces and increased frequency and severity of drought over most land areas in the 21st century under moderate-high emissions scenarios. Coupled with natural climate variations, such as the cold phase of the Interdecadal Pacific Oscillation since around 1999, the U.S., Brazil, southern Europe and many other regions will likely experience more severe and widespread drought in the 21st century (including what already happened since 2000 in the western U.S.). One of the main drivers of the drying is the increased evaporative demand for moisture due to rapid increases in near-surface water vapor pressure deficit under rising temperatures over all land surfaces. Another key driver is the decreasing precipitation over many subtropical land areas primarily due to enhanced drying effect of subsidence as the vertical gradient of water vapor content increases with global warming. In this presentation, I will examine these key underlying mechanisms through which global warming may lead to a drier surface and increased risk of drought over most land areas.