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Direct and Indirect ENSO Influences on Regional Climate

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El Niño-Southern Oscillation (ENSO) is one of the strongest signals in the tropics and imposes large influences on climate in many regions, such as the Indian summer monsoon, central American precipitation, and the South China Sea precipitation. ENSO affects regional climate variability both directly and indirectly. The direct influence is through concurrent atmospheric circulation response to anomalous heating associated with equatorial central and eastern Pacific SST anomalies. The indirect influence is by first inducing regional SST anomalies through the so-called “atmospheric bridge” and then atmospheric circulation response to the regional SST anomalies. Previous studies are either focused on the direct influence of ENSO via concurrent atmospheric change or the indirect influence of ENSO via regional SST anomalies. In this talk, the presenter will distinguish the direct and indirect influences of ENSO and demonstrate how the two types of influences may play together in leading to regional climate variability. Summer climate anomalies in three regions will be used for illustration: the Indian summer monsoon, central American summer precipitation, and the South China Sea summer precipitation.