



## **Variations in ENSO activity**

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It has been recognized that ENSO is a complex phenomenon and its nature and level of activity have underwent great changes in the past half a century. Some recent work will be presented to show that there are two-types of El Niño events, so called warm-pool and cold tongue El Niño events, respectively. They are likely related to two different coupled modes, one is the recharge oscillator mode, the other is a mode mainly owing to the advective feedback. Moreover, as the tropical-Pacific ocean warms up, intraseasonal variability and ENSO activity as well as their interaction tend to intensify accordingly. The interaction between ENSO and the intraseasonal variability may destabilize both warm-pool and cold tongue El Niño through the noise-induced instability (NII) and may be responsible for generating extreme ENSO events. Future ENSO activity depends on changes not only in the climate state but also in the intensity of the ENSO-MJO/WWB interaction.