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# Pacific Coastal Niño Events and their Connection to basin-scale El Niños

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Pacific coastal Niño Events are warm events at the South American coast, causing strong rainfall and impacting local ecosystems. In 2017, such an event occurred without any corresponding warming in the central Pacific. Other events, for example, observed in 2023, are followed by strong basin-wide El Niños. The latter event is very similar to the “canonical” El Niño events described by Rasmussen and Carpenter in 1983. Since the beginning of the 1980s El Niños have looked quite different. Thus, we have conducted to separate studies, one on the differences between Coastal Niños, which stay at the coast (as in 2017) and those that turn into basin-wide Events (as in 2023), and another one on the decadal differences of El Niños.

The first study reveals a connection between the spreading of coastal Niños and the Pacific Meridional Mode in the Community Earth System Model Large Ensemble. Warmer temperatures in the equatorial western Pacific and the subtropical northeastern Pacific enhance the probability of coastal Niños to evolve into basin-wide events. In turn, coastal Niños also enhance the chance of an El Niño to occur.

In the second study, decadal difference in the propagation direction of El Niño events are investigated. Events in the 1960s and 1970s were predominantly westward propagating, while events after the “climate shift” in the late 1970s show an eastward propagation. After 2000 however, westward propagating events were observed again. The role of the timing of equatorial waves and the Pacific Decadal Oscillation are explored, to explain these decadal shifts.