

SESSION: (B1) Mechanisms of S2D predictability

(B1-02)

Initialized decadal prediction for transition to positive phase of the Interdecadal Pacific Oscillation and resumption of larger rates of global warming

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The negative phase of the Interdecadal Pacific Oscillation (IPO), a dominant mode of multi-decadal variability of sea surface temperatures (SSTs) in the Pacific, contributed to the reduced rate of global surface temperature warming in the early 2000s. A proposed mechanism for IPO multidecadal variability indicates that the relative magnitude of decadal timescale upper ocean heat content in the off-equatorial western tropical Pacific could provide conditions for an interannual El Niño/Southern Oscillation (ENSO) event to trigger a transition of tropical Pacific SSTs to the opposite IPO phase. Evidence is presented from a set of initialized hindcasts with CCSM4 to show this role for El Niño in the 1970s transition to positive IPO, and for La Niña in the late 1990s transition to negative IPO. A decadal prediction initialized in 2013 shows that the Niño3.4 SSTs qualitatively tracked the observations through 2015. The year 3-7 average prediction (2015-2019) from the 2013 initial state shows a transition to the positive phase of the IPO from the previous negative phase, and a resumption of larger rates of global warming over the 2013-2022 period consistent with a predicted positive IPO phase.