



## **Strengthening the Relation between the Tropical Pacific SST and the Mid-latitude Atmospheric Variability since the Mid-1980's**

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Seasonal Footprint Mechanism (SFM) has suggested that North Pacific variability could initiate the tropical Pacific SST variability through air-sea interaction. The wintertime atmospheric anomalies (North Pacific Oscillation, NPO) causes warm SST anomalies over the extratropical eastern Pacific and then those SST anomalies persist through several months as propagating to the central tropical Pacific, which generates anomalous westerly in the tropical Pacific and triggers El Nino in the following winter. Observational data shows that about half of positive phases of NPO could initiate El Nino events and the rest fail to induce specific tropical Pacific SST pattern using observational data. In this study, we use various methods suggested by previous studies to prove changes in connections between the tropical Pacific SST and the mid-latitude variability using observational data from 1950 to 2009. All of the results conclude that the NPGO/NPO-induced ENSO by one year lag (i.e. SFM) has recently been enhanced. The spatial structure of NPO-induced ENSO is similar to a new type of El Nino, Central Pacific El Nino; therefore, the recent enhancement of ENSO variability triggered by NPO would be one possible explanation of the frequent occurrence of Central Pacific El Nino since the 1990's. In addition, this strengthening of relationship seems to modulate the atmospheric variability in the North Pacific. In this presentation, the mutual feedback between mid-latitude and tropics in the decadal time scale and the dynamical understanding will be suggested.