

## Possible remote influence on pacific decadal variability and predictability

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We explore causes of less skills in hindcasting recent decadal climate changes, such as the Pacific decadal variability and the so-called hiatus of global warming tendency in the 2000s. As the hiatus forms a negative Pacific Decadal Oscillation (PDO)-like spatial pattern, together with the warming tendency in the extratropical North Atlantic relating to the Atlantic Multidecadal Oscillation and the strong temperature rising in the Indian Ocean, here we focus on the sea surface temperature (SST) tendency in the Pacific and on possible remote influences from other oceans. The Pacific decadal variability is generally regarded as an internal fluctuation in the climate system and, when statistically analyzing sets of initialized decadal hindcasts for recent decades, errors in initial state of the tropical Pacific SST can control skills in predicting extratropical SST variability relating to the PDO. By performing some sensitivity experiments using global climate models, in addition, we also find small but significant impacts of the other oceans on some stages of the Pacific decadal variability. While our ability to predict decadal variations in each ocean is limited at this stage, except for the high latitude of the North Atlantic, further understanding of these remote influences in addition to the inherent decadal fluctuations over the Pacific Ocean can help us to enhance the predictability of decadal climate changes.

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