

Multiyear climate prediction with initialization based on 4D-Var data assimilation

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A series of 9-month-long 4D-Var coupled assimilation experiments (from Jan. to Sep. of each calendar year) for the period between 1960 and 2006: Optimization of ocean initial condition and air-sea coupling parameter values.

Sets of three-member ensembles of 6-year-long model simulations:

Approach run: The first year (Yr0), including the period of the assimilation window

Multiyear hindcasts: The subsequent 5 years (Yr1, Yr2, Yr3, Yr4, and Yr5)

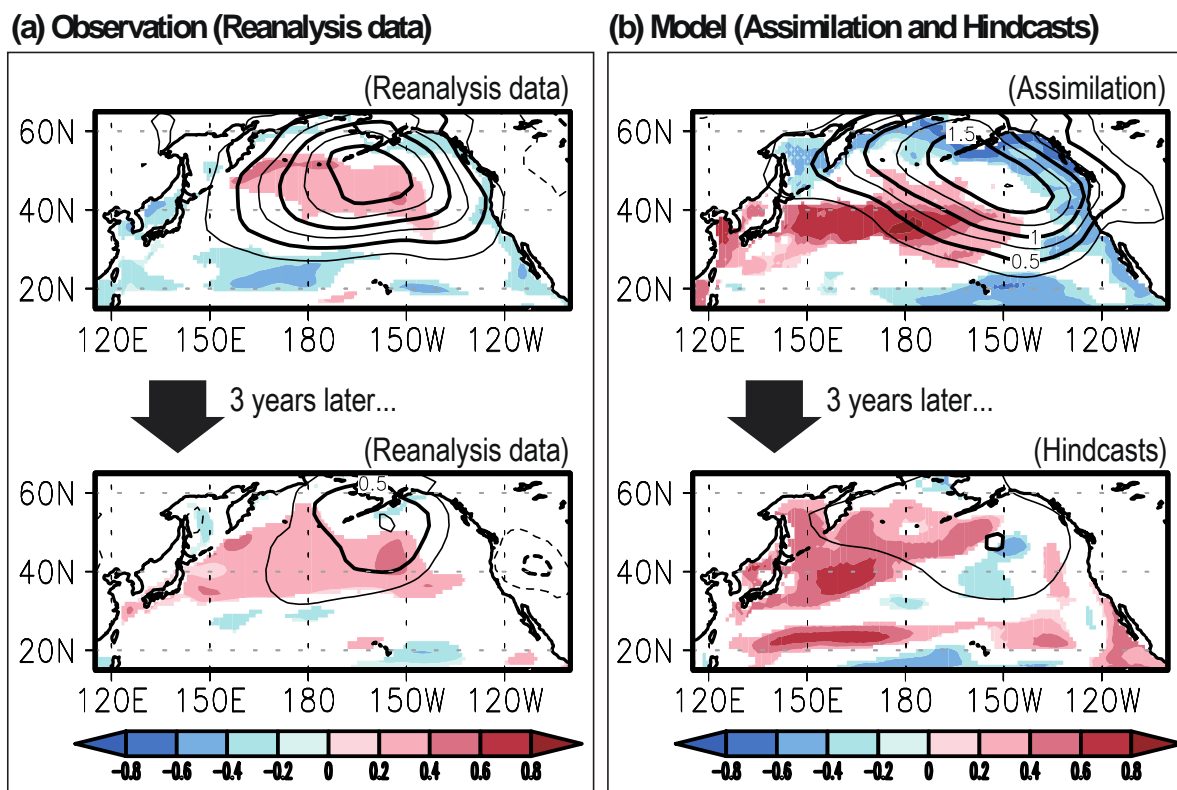


Fig. 1: Correlations (SSH; shades) and regressions (SLP; contours) with the Aleutian Low variations (North Pacific index) in Yr0.

Self-consistency as a coupled climate state in 4D-Var approach, even though keeping model bias in climatology, can enhance the value of initial conditions.

A predictive skill significantly demonstrated over the central North Pacific represents potential benefit of 4D-Var initialization in multiyear climate prediction.