

## Model dependence on responses over the U.S. to leading patterns of SST variability

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This study investigates the model dependence of the response over the U.S. to the leading patterns of SST variability with a focus on the physical mechanisms through which these SST patterns affect the U.S. climate. The output of idealized AGCM experiments performed by the NCEP GFS, the NASA NSIPP1, the NCAR CCM3, the GFDL AM2.1 and the NCAR CAM3.5 is used. These models are forced with three leading SST EOFs, consisting of a linear trend EOF, an ENSO-like Pacific SST EOF, an Atlantic SST EOF that resembles the Atlantic Multi-decadal Oscillation, and their various combinations.

The model inter-comparison of the responses to the three leading SST EOFs over U.S. subregions, including the Great Plains, Northwest, Southwest, Northeast and Southeast, throughout the seasonal cycle is performed. The agreement among the models in their responses to the Pacific SST EOF is overall better than those for the Atlantic and the linear trend SST EOFs. While the SST EOFs mainly affect the U.S. by modulating the atmospheric circulation and moisture distribution over the U.S. and surrounding regions, the impacts over the U.S. subregions often vary from model to model because of the varying locations of the modulations, a result of differences in the parameterization of the atmospheric physics and land-atmosphere feedback processes over the U.S. in these models.