



Understanding the influence of ENSO on the North Pacific variability

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ENSO is known to influence worldwide climate through the atmospheric response to sea surface temperature anomalies in the equatorial Pacific. Atmospheric bridge and oceanic tunnel connections have been ascribed to explain Tropical Pacific (TP)-North Pacific (NP) interactions. Nevertheless the portion and timescales of the extra-tropical SST variability modulated by ENSO or inherent to the extra-tropics are not completely resolved.

A state of the art CGCM is used to investigate the effects of ENSO interannual variability on atmospheric and oceanic conditions in the North Pacific. The coupled model has been constrained in the Tropical Pacific sector with interannually varying observed SST from 1949 to 2004. The forced experiments have been compared with a long control simulation performed with the same CGCM to evaluate the importance of a realistic tropical sector in the simulation of the North Pacific variability.

During winter warm SST anomalies in the Equatorial Pacific are correlated with negative SST anomalies in the Western Tropical and Eastern North Pacific Ocean. This well-known pattern is not realistically simulated by the CGCM that tends to simulate a strong connection between the Equatorial Pacific sector and the western subtropical North Pacific, but it drastically improves when the interannual tropical Pacific variability is realistic. A preliminary analysis of the North Pacific variability suggests that at interannual timescales the TP-NP connection is mostly driven by atmospheric processes. However, Kelvin and other coastally trapped ocean waves generated by a realistic ENSO along the west coast of North America influence the North Pacific

Ocean variability suggesting a dynamical ocean response to tropical SST anomalies.