Geophysical Research Abstracts
Vol. 18, EGU2016-6386, 2016
EGU General Assembly 2016

Sensitivity of ENSO teleconnections to a warming background state.

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The sensitivity of ENSO teleconnections to the background state is investigated using two ensembles of coupled model experiments, one representative of the pre-industrial climate and the other one expected of the end of the 21st century based on the high emission RCP85 scenario. A 30-year period of representative ENSO events bearing resemblance to observed ones is a priori selected from a 850-year pre-industrial simulation of the CNRM-CM5 model. Following the so-called pacemaker protocol, new coupled experiments are carried with the model SST being restored in the eastern tropical Pacific towards the selected anomalies, the rest of the globe being fully coupled. In the first set of experiments, the anomalous restoring is applied on top of pre-industrial mean ocean state and in the second, on top of RCP85 mean state. Two sets of 10-member of 30-year long integrations are then generated. By construction, they share the exact same ENSO and thus make it possible to strictly isolate the dependence of the ENSO teleconnections to a warmer background state.

Results confirm the eastward shift of the ENSO-induced deepening Aleutian low as documented in the literature for the winter season. They also show changes in the wintertime teleconnection over the North Atlantic. Several diagnostic tools (such as E-vectors) are used to investigate the dynamics of the teleconnection between the tropical Pacific, the North Pacific and dowstream towards the North Atlantic along the jet wave guide. A more indirect route based on the change in the Walker cell and associated signals in the tropical Atlantic leading to the excitation of forced Rossby wave is also analysed.