Tropical Pacific - high latitude South Atlantic teleconnections as seen in the network of ice cores from coastal Dronning Maud Land (DML), Antarctica

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In recent years there has been increased focus on the interaction between Antarctic climate and the tropical ENSO. A detailed study of the complicated nature of the interaction with the climatic system around Antarctica is hampered by the network of instrumental records being sparse and of short duration. The proxies from ice cores provide therefore a useful extension to available data. We use a network of ice cores from coastal Dronning Maud Land (DML) to examine the role of ENSO in the temporal variability of $\delta^{18}O$. It is demonstrated that the isotope records from the analyzed coastal cores capture a signature of large-scale circulation processes affecting the seasonal variations of snow deposition, thereby suggesting the presence of a strong bias in snow accumulation. Our analysis suggests that a multi-decadal positive trend in mean annual $\delta^{18}O$ values from these cores is not directly related to local temperature, but appears to be caused by warming of the western Pacific. A westward displacement of the enhanced tropical convection centre causes an increase in winter sea level pressure north of DML, leading to less winter precipitation, i.e. more positive annual $\delta^{18}O$ values at the ice cores sites. These results are in line with the negative trend in accumulation in DML, evident since approximately 1925