

S4T2

## **The influence of atmospheric circulation on marine air temperature**

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Atmospheric circulation is an important influence on local climate, affecting meteorological variables such as temperature, precipitation, cloud cover and humidity. Relationships between surface meteorology and atmospheric circulation have been shown over many land and marine areas. The extent to which these relationships can explain past climate variability however is unclear, especially over the oceans. We investigate the extent to which atmospheric circulation can predict past marine air temperature variations by presenting estimates of marine air temperature from 1880-2010 derived from atmospheric circulation patterns. Atmospheric circulation patterns are defined from calculations of flow direction and flow rotation (indicating the position of the nearest cyclone/anticyclone), which are calculated using only observations or estimates of Sea Level Pressure (SLP). Both observational and reanalysis based datasets of SLP and marine air temperature are analysed. Estimated and observed marine air temperatures are strongly correlated from the mid-20th century onwards, especially in the Northern Hemisphere for both observational and reanalysis based datasets. Differences between the estimated and observed marine air temperatures may highlight other influences on temperature aside from atmospheric circulation. Alternatively such differences may result from uncertainties in SLP, marine air temperature or the circulation based temperature anomalies that require further investigation. The potential for the use of estimates of atmospheric circulation to give insight into past marine climate variability will be discussed.

### **Oral**

- **Reconstructing past climates (methods)**