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Sensitivity of the North Atlantic storm track to regional drivers of change

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This poster is part of the UK-funded TEMPEST (Testing and Evaluating Model Predictions of Extra-tropical Storm Tracks) project. The initial stages of an investigation into the response of the extra tropical storm tracks to 21st century forcings are presented. In particular, we focus on the wide spread present in the responses of the North Atlantic storm track between different climate models. The simulations run for the third phase of WCRP's Coupled Model Intercomparison Project (CMIP3) generally agree on the nature of the change to extra-tropical storm tracks during the 21st century in that both the southern hemispheric and the Pacific storm tracks shift poleward, along with their associated jet streams. This is consistent with the expected expansion of the Hadley cell. The response of the North Atlantic storm track, however, seems to be harder to pin down; there is a wide spread between the models as to even the qualitative nature of the response. We are using the UK Met Office's HadGAM model to pick apart the physical mechanisms which may be important for changes to the North Atlantic storm track. Several mechanisms have been suggested to contribute to the changes including changes in tropical precipitation, changes in the North Atlantic sea surface temperatures, changes in Arctic sea ice coverage and the land-sea temperature contrast. For this initial stage of the project we have focussed on the impact that the North Atlantic sea surface temperatures on the storm track. In particular, whether or not the widely varying model storm track responses are linked to the large spread between the models in the North Atlantic sea surface temperature changes over the 21st century. This spread is in turn related to changes in the strengths of the Atlantic meridional overturning circulation.