

## South Atlantic Anti-Cyclone as a driver of Atlantic Niño variability

\*Noel S Keenlyside<sup>1</sup>, William Cabos<sup>2</sup>, Dmitry Sein<sup>3</sup>, Shunya Koseki<sup>1</sup>, Hyacinth Nnamchi<sup>4</sup>

1. Geophysical Institute, University of Bergen and Bjerknes Centre, Norway, 2. University of Alcalá, Spain, 3. Alfred Wegener Institute for Polar and Marine Research, Germany, 4. University of Nigeria, Nigeria

Atlantic Niño variability remains poorly understood and predicted, despite exhibiting some apparent similarities to the El Niño Southern Oscillation. Here we show that extra-tropical influences play a dominant role in driving Atlantic Niño variability, bringing a new dimension to our understanding. We assess the role of extra-tropical atmospheric variability in driving observed Atlantic variability by comparing ensemble simulations with two configurations of a regional coupled climate model. In one case the South Atlantic Anticyclone is prescribed at the southern boundary of the regional atmospheric model, while in the other it is simulated within the domain. In both configurations, atmospheric reanalysis drive the global ocean model outside of the coupled domain and are prescribed as boundary conditions to the regional atmospheric model. Extra-tropical southern hemisphere variability can explain around 50% of the observed Atlantic Niño variability. The greatest impact is from boreal spring and autumn. Comparing models different resolution and parameterisations shows the importance of representing the link between SAA and equatorial Atlantic variability in capturing the observed Atlantic Niño variability. The link between the two regions appears related to thermodynamic ocean-atmosphere interaction.

Keywords: Tropical Atlantic, Climate Prediction, Atlantic Niño, Climate Modelling