

EGU21-9791, updated on 05 Aug 2021

<https://doi.org/10.5194/egusphere-egu21-9791>

EGU General Assembly 2021

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Biases in the Tropical Atlantic in Seasonal Forecast System GloSea5

Tamara Collier, Jamie Kettleborough, Adam Scaife, Leon Hermanson, and Philip Davis

Met Office, Monthly to Decadal Prediction, United Kingdom of Great Britain – England, Scotland, Wales

(tamara.collier@metoffice.gov.uk)

It is well known that climate models commonly show biases in the Tropical Atlantic including reduced cold tongue development in the boreal summer. This work investigates whether these biases are present in the Met Office Seasonal Forecast System (GloSea5) at seasonal lead times and the impact they have on teleconnections to the North Atlantic, a key area for forecasting for Northern Europe.

GloSea5 hindcasts covering the period 1993 – 2016 are analysed for winter and summer start dates and biases are calculated with comparison to ERA Interim for sea surface temperature, near surface winds and upper tropospheric winds, and the Global Precipitation Climatology Project (GPCP) for Rainfall Rate. In contrast to fully developed climate model biases, enhanced cold tongue development is found in the summer months, and a general cold bias occurs in the SST in both winter and summer. This shows that biases in initialised forecasts do not simply asymptote to the climate model error but show more complex behaviour including a change in the sign of the bias. Easterly winds are found to be strengthened throughout and signs of a double Inter Tropical Convergence Zone (ITCZ) are observed in the winter season. The ITCZ in both seasons is shown to be a narrower band of heavier rain in GloSea5 compared to the GPCP. We investigate how these tropical biases propagate into the North Atlantic and change the forecast biases there.