Geophysical Research Abstracts
Vol. 18, EGU2016-2283, 2016
EGU General Assembly 2016

Potential for seasonal prediction of Atlantic sea surface temperatures using the RAPID array at 26ºN

Aurélie Duchez (1), Peggy Courtois (2), Joël Hirschi (1), Simon A. Josey (1), and David Smeed (1)

(1) National Oceanography Centre Southampton, Marine System Modelling, Southampton, United Kingdom (a.duchez@noc.ac.uk), (2) Department Earth and Atmospheric Sciences, University of Alberta, Edmonton, AB, Canada.

The Atlantic meridional overturning circulation (AMOC) plays a critical role in the climate system and is responsible for much of the meridional heat transported by the ocean. In this study, the potential of using AMOC observations from the 26ºN RAPID array to predict North Atlantic sea surface temperatures (SSTs) is investigated for the first time. Using spatial correlations and a composite method, the AMOC anomaly is used as a precursor of North Atlantic sea-surface temperature anomalies (SSTAs). The results show that the AMOC leads a dipolar SSTA with maximum correlations between 2 and 5 months. The physical mechanism explaining the link between AMOC and SSTA is described as a seesaw mechanism where a strong AMOC anomaly increases the amount of heat advected north of 26º N as well as the SSTA, and decreases the heat content and the SSTA south of this section. In order to further understand the origins of this SSTA dipole, the respective contributions of the heat advected by the AMOC versus the Ekman transport and air–sea fluxes have been assessed. We found that at a 5-month lag, the Ekman component mainly contributes to the southern part of the dipole and cumulative air–sea fluxes only explain a small fraction of the SSTA variability. Given that the southern part of the SSTA dipole encompasses the main development region for Atlantic hurricanes, our results therefore suggest the potential for AMOC observations from 26ºN to be used to complement existing seasonal hurricane forecasts in the Atlantic.