



## **The sensitivity of the large-scale circulation to uncertainties in the representation of air-sea interactions**

Mark Rodwell (1), Jean Bidlot (1), Irina Sandu (1), and Isla Simpson (2)

(1) ECMWF, Reading, UK (mark.rodwell@ecmwf.int), (2) NCAR, Boulder, Colorado (islas@ucar.edu)

Global climate models have been shown to exhibit a tropical/subtropical easterly bias in near-surface winds relative to analyses and observational data. The growth of similar biases (and indeed biases in the entire zonal-mean Hadley Circulation) can be seen within the first few hours of weather forecasts produced at the European Centre for Medium-Range Forecasts (ECMWF), and these appear to be sensitive to the representation of air-sea interactions. This suggests that diagnostics of such interactions in NWP (and data assimilation) can motivate improvements in weather forecasting and inform us on the trustworthiness of climate projections. Here we present results of NWP experiments that investigate the sensitivity of these biases to a range of aspects associated with air-sea interactions, including the representation and effects of surface waves, and the formulation of surface momentum, heat and moisture fluxes. We also discuss the impact of such sensitivities on tropical-extratropical teleconnections.