Climate and seasonal forecast quality impact of increased horizontal ocean resolution

Isabel ANDREU-BURILLO

IC3/CFU, Spain, isabel.andreu-burillo@ic3.cat
F. Doblas-Reyes(1,2), V. Guemas(1,3), M. Asif(1)
(1) Institut Català de Ciències del Clima (IC3), Doctor Trueta 203,
08005 Barcelona, Spain
(2) Institució Catalana de Recerca i Estudis Avançats (ICREA),
Barcelona, Spain
(3) Centre National de Recherches Météorologiques, Groupe d'Etude de
l'Atmosphère Météorologique (CNRM-GEAM), UMR 3589, 42 Av. G. Coriolis,
31057 Toulouse CEDEX
Presenter : Isabel Andreu-Burillo

This seasonal-prediction study explores the impact of an increased ocean-model resolution on the representation of the ocean-atmosphere-ice system modelled by EC-Earth3.

Two setups with identical atmospheric and coupler parts differ in the resolution of their ocean model, started from the GLORYS ocean and sea-ice analyses, with horizontal meshes of 1° and 0.25° respectively.

Contributing to the SPECS EU Project (Seasonal-to-decadal climate Prediction for the improvement of European Climate Services), an analysis of the main biases of the system, performed through validation against independent data, provides an overview of the strengths and weaknesses of our tool, pointing at some key areas where improvement is still expected. Discussion around the decrease of these errors, whether attained or still to come, will be engaged. Other diagnostics like climatology estimates and prediction plumes for the different Niño regions will be complemented with coupled general circulation and upper-ocean diagnostics, with an interest in ocean processes and their relevance in the other parts of the whole. Special focus will be brought to the Tropical regions of the Pacific and Atlantic basins, in continuation to our studies within the QWeCI (Quantifying Weather and Climate Impacts on Health in Developing Countries) international project.

Preliminary analyses of these experiments bring up notable changes in precipitation skill, pointing at the influence of ocean representation on its coupled counterparts at seasonal time-scales. Many of these changes carry an improvement of the forecast: we will explore the mechanisms of these changes when characterizing the overall outcome.