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CMIP5-downscaled projections for the NW European Shelf Seas: initial results and insights into uncertainties

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The North Sea, and wider Northwest European Shelf seas (NWS) are economically, environmentally, and culturally important for a number of European countries. They are protected by European legislation, often with specific reference to the potential impacts of climate change. Coastal climate change projections are an important source of information for effective management of European Shelf Seas. For example, potential changes in the marine environment are a key component of the climate change risk assessments (CCRAs) carried out under the UK Climate Change Act

We use the NEMO shelf seas model combined with CMIP5 climate model and EURO-CORDEX regional atmospheric model data to generate new simulations of the NWS. Building on previous work using a climate model perturbed physics ensemble and the POLCOMS, this new model setup is used to provide first indication of the uncertainties associated with: (i) the driving climate model; (ii) the atmospheric downscaling model (iii) the shelf seas downscaling model; (iv) the choice of climate change scenario. Our analysis considers a range of physical marine impacts and the drivers of coastal variability and change, including sea level and the propagation of open ocean signals onto the shelf. The simulations are being carried out as part of the UK Climate Projections 2018 (UKCP18) and will feed into the following UK CCRA.