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FUTURE HIGH RESOLUTION UK WAVE PROJECTIONS

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Limited projections exist for future UK wave conditions, particularly at a high spatial resolution. From the projections that do exist, results vary. This has led to low confidence in future average and extreme wave conditions around the UK (Palmer et al., 2018), creating challenges for future coastal resilience planning. High resolution projections are required to capture coastal geometry, complex bathymetry, and shallow water wave transformations that are important for a complete representation of the total wave field around the UK coastline.

Palmer et al. (2018) used global wave models driven by CMIP5 10 metre wind and sea ice climate projections and one regional wave model (Bricheno and Wolf, 2018) to assess future UK wave conditions. Bricheno and Wolf (2018) used a nested wave model (WAVEWATCH III v3.14) forced with EC-Earth global and Euro-CORDEX regional climate projections, demonstrating a significant improvement in wave direction skill in the higher resolution (12km) model.

Here we adapt the version of WAVEWATCH III which is run operationally by the Met Office to produce wave forecast products. The wave model has (i) a global model domain, and (ii) a higher resolution nested domain (AMM15) covering the UK shelf seas. The AMM15 domain has a 3km offshore and 1.5km nearshore resolution. The model was forced with UKCP18 (HadGEM3-GC3.05) global 10 metre wind and sea ice climate projections from 1979-2080. Model verification and future projections are presented for the AMM15 domain and for select coastal sites around the UK.