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## Downscaling of an unstructured-grid model for the German Bight

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Coastal areas in the North Sea and more specifically the German Bight are subject to continuously developing activities such as, among others, wind farming, transportation, river regulations and transport. The resulting environmental changes interact with those caused by the local natural variability and interaction with the open ocean. Coastal areas are representatives of the biogeochemically most active regions, incorporating interactions between land and ocean, sediment dynamics and morphodynamics. The small temporal and spatial scales of processes are challenging for the provision of sufficient and credible high-resolution 4D observations. Therefore, the mix between modelling and observations is considered as the most efficient tool to develop up-to-date coastal products, such as predictions and estimates of coastal and estuarine states, and scientific support for activities and decision making. Thereby, one major research direction is to shorten the gap between regional ocean and coastal/estuarine modelling and to ensure a seamless interface between CMEMS and regional operational predictions. This is demonstrated in our REST-COAST applications for the German Bight and its estuaries where we develop flexible interfaces beneficial for the CMEMS framework and coastal forecasting systems. This development is transferable to other European coastal areas and contributes to harmonizing various similar, and nor well inter-linked, activities. The downscaled model is based on the SCHISM unstructured-grid model coupled to the wind wave model WWM. The performance of the German Bight circulation model is assessed against in-situ observations and CMEMS regional products.