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PRESENT AND FUTURE SEABED VULNERABILITY TO THE CLIMATE-CRISIS OVER NORTH WESTERN EUROPEAN SHELF.

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Installation of large marine infrastructure on the seabed is part of an accelerated schedule to switch away from fossil fuels and to protect coastlines. When natural currents in the sea deviate around such infrastructure, it can change the shape and composition of the seabed. Cumulative impacts of local flow amplification and background climate-driven baseline will influence seabed mobility, thus sediment composition and habitat suitability. Some animals might be affected negatively from such changes, and some positively.

ECOWind-ACCELERATE (https://ecowind.uk/) is assessing the combined impacts of climate change and large offshore windfarms on the rate and nature of seabed (ecosystem) changes over various spatial and temporal scales. We have mapped changes to bed stresses by 2050 and by 2100 for the NW European Continental Shelf. We quantified how and where waves dominate change to bed stresses, and sea level rise lowers energy transfer to the bed. Our maps of predicted sediment transport capacity show that in certain hotspots, sand and gravel will be mobilised more by mid and end century in places where sand and gravel does not move today.

We highlight what aspects of future climate will impact seabed stresses and sediment mobility (thus habitat suitability) over which time scales. This will help inform the design and evaluation of approaches to effective environmental monitoring, compensation measures and decommissioning. We want to provide the context within which nature recovery can be promoted at the same time as future climate change-adaptive and resilient offshore structures are designed.