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Effect of bathymetric data resolution on the understanding of sediment mobility: implications for offshore infrastructure projects on deglaciaded continental shelves

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Sediment mobility is one of the key issues considered during the design and construction process of offshore infrastructure (Wind farms, cables, pipelines etc.). Early understanding of the seabed mobility can significantly affect the project timelines, cost and, if not mitigated, can reduce the lifespan of already existing assets. The most common approach to evaluate sediment mobility relies on repeated bathymetric surveys which aim to unravel the rate of change of the seabed over time. However, repeated surveys to be effective require to be performed over timelines allowing for confident detection of change above the uncertainty threshold and need to consider seasonal conditions within the area of interest. This time separation typically needs to be greater (several years) the bigger the mobile bedforms across the area. This means that it is unlikely that a result of a repeated bathymetric survey will be available early in the project life. Here, a public domain repeated bathymetric survey data from a deglaciaded continental shelf area offshore N-E Scotland with moderate-to high-resolution(2-8m) data will be used to (1) identify mobile and immobile paleo bedforms, (2) quantify the rate of change of the seabed and (3) investigate the effect on different data resolution on the seabed mobility quantification.