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UAV photogrammetry and 3D scan data for topographic mapping and monitoring of maritime heritage

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Cultural heritage in maritime areas experience changes via natural and anthropogenic processes. This change must be monitored on a range of temporal and spatial scales to understand the evolution of these environments, particularly in the context of projected climate change yielding increased sea-levels and storm frequency. Commercial survey grade unmanned aerial vehicle (UAV) and 3D scan equipment, data processing and analysis tools are available to coastal and heritage managers, engineers and researchers.

This study, undertaken as part of the CHERISH project, analyses the use of photogrammetry via UAVs and 3D scan data from scanning total stations in Irish coastal locations with tangible cultural heritage to produce orthoimage mosaics and digital surface models. These products extend and complement acoustic bathymetric data in mapping vulnerable coastal regions. Results indicate that combining relevant techniques to produce seamless onshore-offshore maps can provide high-resolution information about emergent and submergent coastal geomorphology on a range of scales for use in monitoring and managing coastal heritage sites.