

# Determining the Maritime Baseline for Marine Cadastre

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## SUMMARY

A fundamental component of any marine cadastre is the accurate positioning of the baseline since this defines the landward limit of marine parcels. Typically the maritime baseline is based on some form of Low Water Mark (LWM). However, it is notoriously difficult to determine the location of the baseline since within the highly dynamic coastal environment, the LWM is constantly shifting. The primary aim of this research is to develop a methodology to efficiently determine the baseline by acquiring an integrated terrestrial Digital Terrain Model (DTM) using DGPS and a marine DTM based on near-shore bathymetry and tidal data, in order to derive the location of the baseline at a particular time. Fieldwork was carried out at Millport, Scotland using DGPS coupled with marine radio-echo sounding to generate DTMs, which were then compared to DTMs using DGPS, SRTM, ASTER GDEM and NEXTMAP. This established that the method adopted produced more robust results than those derived from existing datasets. Low-water lines (eg MLWS: Mean Low Water Springs, LAT: Lowest Astronomic Tide) were generated and compared to their locations shown on the current Ordnance Survey and Admiralty maps and charts. Results show highly accurate low-water lines (LAT) were produced using this method and demonstrated the movement of LAT inland, likely due to a combination of sediment loss and sea level rise. A second objective was to review maritime baseline policy of other coastal countries, especially those neighbouring Malaysia. It was found that most coastal countries have a multitude of coastal management policies and initiatives to manage their coastal environment sustainably but policies designed to sustain the integrity and position of the maritime baseline are almost non-existent. Such a finding also applies to Malaysia's land and marine related legislation and coastal zone management initiatives. The principal conclusion is that the approach demonstrated here is an efficient and repeatable way to derive the low-water line along small segments of coastline for the needs of a marine cadastre but that there is an overriding need for an integrated and sustained policy to establish and regularly update the maritime baseline in Malaysia.