

SEDIMENT-PROFILE IMAGING SURVEY OF MILFORD HAVEN WATERWAY, WALES, UK - MAY 2012

Prepared for
Milford Haven Waterway
Environmental Surveillance Group
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EXECUTIVE SUMMARY

A detailed map and dataset of sedimentary habitats in the Milford Haven Waterway was compiled for the Milford Haven Waterway Environmental Surveillance Group (MHWESG) from seafloor images collected in May, 2012. This is the most comprehensive assessment of sediment distribution and benthic habitat composition available for the Milford Haven Waterway. The results included grain-size information, biological characteristics, and evidence of sediment transport conditions and effects of biological activity. In the context of the Milford Haven Waterway, an interpretative framework was developed that classified each of 559 stations within a 'facies' that included information on the location within the estuary and inferred sedimentary and biological processes. This framework groups the stations into classes with similar sediment transport conditions used to describe landscape-scale habitats and can be used to direct future monitoring activities within the Milford Haven Waterway.

Germano & Associates, Inc. (G&A) performed a Sediment-Profile and Plan-View Imaging (SPI/PV or SPI) survey in Milford Haven Waterway in May, 2012. The SPI survey obtained images of cross-sections of the sediment-water interface and plan-view images of the seafloor surface. Collection of images from 559 stations provided a synoptic view of the sediment mosaic and was used to assess the condition of sediment infaunal communities of the waterway system. In order to map the sediment mosaic, facies descriptions commonly employed by field sedimentary geologists were used to integrate the SPI and PV information. Sediment facies are generally used to describe the sum of characteristics of sediment units at a small (cm-m) scale. Intertidal sediment 'facies' maps have been compiled in the past for Milford Haven Waterway; this approach was expanded to map the subtidal portions of the Waterway.

Because sediment facies can be projected over larger areas than individual samples (due to assumptions based on physiography, or landforms) they represent a model of the distribution of sediments in an estuary. This model can be tested over time and space through comparison with additional samples or older sample results. This approach provides a means to evaluate stability or change in the physical and biological conditions of the estuarine system. Indeed, initial comparison with past results show remarkable stability over time for the Milford Haven Waterway.

We recommend that MHWESG utilize the results of the SPI and PV survey for planning purposes:

1. Prioritize sediment and benthic sampling within habitats and sediment facies most at risk from localized disturbance and contamination.
2. Focus future sampling density to reflect the variation and transition between sediment facies and broad grain size groupings. Fewer samples can be located in relatively homogeneous areas such as Pembroke River whereas more samples should be taken in areas with heterogeneity such as Dale Roads, Pwllcrochan Flats or Angle Shelf.
3. Utilize the Appendix E with 'popup' images of SPI and PV superimposed on switchable layers (bathymetry, facies) to investigate sediment conditions in specific areas of interest. Close study of the raw data using the guidance in interpretation provided by this study is preferable to accepting models or maps of grain size estimation.