

The Liverpool Bay Coastal Observatory

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A Coastal Observatory has been operating since August 2002 in Liverpool Bay, Irish Sea. Its rationale is to develop the science underpinning the ecosystem based approach to marine management, including distinguishing between natural and man-made impacts. Liverpool Bay has strong tidal mixing, receives fresh water principally from the Dee, Mersey and Ribble estuaries and has enhanced levels of nutrients. Horizontal and vertical density gradients are variable both in space and time. The water column stratifies intermittently. Because of this variability the area is an excellent test of the physical understanding of continental shelf seas and a stringent test of real-time model predictions. The Observatory has three components – measurements, some in near real-time, numerical modelling and a data management and web-based data delivery system, see <http://coastobs.pol.ac.uk>. The four measurement main strands, each on different space or time scales are fixed point time series (both in situ and shore-based), regular spatial water column surveys, HF radar for surface currents and waves and an instrumented ferry. The emphasis is on physical and chemical / biological variables which are also modelled with coupled 3-D hydrodynamic, wave and ecological models forced by forecast meteorology. A major objective is to obtain multi-year records to quantify processes and events. In the next few years the Observatory will expand in spatial coverage and in capability, for instance through the deployment of gliders, forming a focus for Irish Sea studies. The Observatory is being used in investigations of whether enhanced nutrient levels lead to undesirable disturbances, provide information for shoreline management and study potential impacts of climate change.