High resolution coastal ocean model of Galway Bay, Ireland, supporting oyster aquaculture and biodiversity restoration.

A hydrodynamic model of Galway Bay has been developed based on ROMS 3.9. The model constitutes a 2nd level one-way offline nesting in Marine Institute's regional North East Atlantic model (NEATL, c.1.1 km resolution) and a Connemara model (c. 200 m resolution), resulting in 336 x283 grid cells, 8 sigma vertical levels and a horizontal resolution of less than 70 meters. The NEATL model is forced by the Copernicus global analysis model GLOBAL_ANALYSISFORECAST_PHY_001_024. Model validation includes comparisons with the sea surface height from tide gauges, currents from ADCP deployments and drifter releases, temperature and salinity records from several aquaculture farms and data from CTD profiles taken c. every quarter of a year at c. 30 stations. In order to aid the restoration of wild native oyster and to support oyster farming in the bay, it is essential to identify areas suitable for both oyster farming and for oyster settlements based on the prevailing environmental conditions. To support the above initiatives, the Marine Institute (Ireland), partnered with NOW Systems (Nologin Oceanic Weather Systems), to develop an online platform, NAUI, that provides information on hydrodynamic conditions in Galway Bay. Areas of primary interest are mapping of marine conditions that determine suitable grounds and mortality of native oysters, and forecasting of low salinity events. The service is being co-developed with local stakeholders and thanks to NAUI, the end-users have access to updated information from existing monitoring and the Marine Institute's model forecasts.

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