Local data - Global significance

Combining *in situ* time-series measurements with modelling and remote sensing expertise at Plymouth Marine Laboratory.

Over a century of data collection

Providing observations from the western English Channel since 1903.

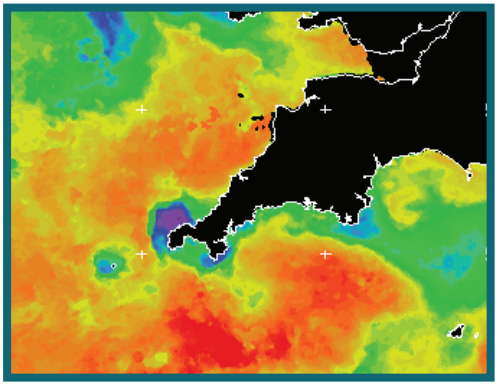
Western Channel Observatory

Advancing understanding of the marine environment through multi-disciplinary scientific research

www.westernchannelobservatory.org.uk

Read the new WCO Special Issue

A collection of scientific papers marking the last 25 years of research in the western English Channel.



The special issue provides new insights into seabed and water column processes as well as their interactions, a key strength of the WCO.

- Harmful algal blooms (HABS) are a key feature of western English Channel productivity and in severe cases can impact important commercial species. The occurrence of some HABs can be statistically related to rainfall and river discharge, **potentially allowing future events to be predicted, information that could inform management and industry** (Barnes *et al*).
- Sediment-dwelling organisms drive the regeneration of nutrients by grazing sunken phytoplankton blooms. Insight into the key seabed infauna involved **enhanced understanding of the biogeochemical cycling of nutrients in coastal seas** (Zhang *et al* & Tait *et al*).
- Clear seasonal cycles were found for microbial plankton, including bacteria. On-going time series observations of plankton continue to be **important for gauging the rate of global climate change,** measuring the response of plankton to that change as well as any **consequences that may have for the marine environment as a whole** (Tarran and Bruun).
- Later and longer lasting blooms of micro-phytoplankton during the summer could **potentially have a positive feedback on climate change** by enhancing carbon draw-down from the atmosphere to the coastal zone (Barnes *et al*).
- The vertical distribution of plankton changes across tidal cycles as tidal currents move water from location to location. By using holographic cameras to measure these changes in plankton abundance and distribution we can **better understand carbon cycling** (Cross *et al*).
- Seasonality in seawater temperature and phytoplankton biomass drive different aspects of the seasonal cycle of the seabed ecosystem process of bioturbation (Queirós *et al*).
- A decrease in the nutritional value of phytoplankton (such as diatoms) reduces predation from microzooplankton, allowing an algal bloom to form. These results support the idea that **reduced cell nutrient content is advantageous for primary producers but reduces the carbon transfer to higher trophic levels** (Polimene *et al*).
- The impact of freshwater run-off upon sediment transport and current speeds has been quantified and demonstrated to be related to the size of the individual river catchments. These results allow the terrestrial influence on the WCO stations to be contextualised and **provide information for better estuarine management** (Uncles *et al*).

Only by understanding local baselines can we understand global change

WCO Special Issue 2015

17 scientific research papers marking the 25th anniversary of the re-establishment of L4

Cross-cutting papers from 25 UK and international institutes

Progress in Oceanography, Volume 137, Part B, Pages 335-570

Read the full papers: www.westernchannelobservatory.org.uk

PML | Plymouth Marine Laboratory

THE MARINE BIOLOGICAL ASSOCIATION

NERC SCIENCE OF THE ENVIRONMENT