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Biogeochemistry of the Western Irish Shelf: The role of picoplankton as assessed by flow cytometry and remote sensing

Monica Mullins and Prof. Peter Croot

Earth and Ocean Sciences, School of Natural Sciences, National University of Ireland Galway

A key challenge in understanding how climate change will impact continental shelf ecosystems is to understand the physical and chemical drivers of primary productivity in these systems and to assess the natural variability on spatial and temporal scales. Presently the impacts of climate change on ecosystem processes/services along the western Irish shelf are poorly known due to a lack of in situ data, this is most notable for the contribution from picoplankton. In this project, we were able to take advantage of the annual WESPAS Fisheries surveys along the Western Shelf waters from 47°N northwards to 58°30'N onboard the Celtic Explorer to obtain biogeochemical data for this region. A number of key Essential Ocean Variables (EOVs) have been measured annually since 2016; including nutrients, baseline optical measurements of CDOM and FDOM, phytoplankton abundance via flow cytometry (Accuri C6) and Chlorophyll concentration in surface waters. Utilizing data from the Sentinel series of satellite allows us then to examine in more detail the potential drivers of picoplankton abundance and their impact on C and other elemental biogeochemical cycles in these waters.

The overarching aim of this work is to provide baseline data for developing biogeochemical climatologies for this region and for determining Good Environmental Status (GES) as per the EU Marine Strategy Framework Directive.

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