

**EnvEast Doctoral Training Partnership**

**Understanding oxygen deficits with a community ecosystem model and isotopic tools (NERC Industrial CASE Studentship)**

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**Background:** Oxygen (O<sub>2</sub>) is essential for complex marine life, including commercially important species of fish and shell fish. O<sub>2</sub> is also used as an assessment variable for [Good Environmental Status \(GES\)](#) with respect to eutrophication. Ongoing assessments have identified significant downward trends in the O<sub>2</sub> concentration in the northern and southern North Sea and the English Channel. However, the assessments identified significant gaps in the data and monitoring practices, as well as a lack of understanding of how physical, biological and climatological processes control oxygen concentrations.

**Methodology:** This project aims at narrowing these gaps in understanding using a combination of i) UK shelf data; ii) model results from the [NERC-Defra Shelf Seas Biogeochemistry \(SSB\) Programme](#); and iii) novel model simulations of oxygen isotopes.

In Phase 1 of the project, the student will validate the model runs using univariate and multivariate statistical techniques. They will then establish if historic and future model trends in oxygen concentration respond to management scenarios.

In Phase 2, the student will implement an oxygen isotope fractionation scheme in the model and compare results with new and archived O<sub>2</sub> isotopologue data.

**Person specification and training:** The project is suited to students with at least a 2(i) BSc in a science discipline, computing or maths; a Masters degree and programming experience are desirable. The student will graduate with advanced practical, analytical and numerical skills in ecosystem modelling, programming and data analysis. They also have the opportunity to participate in a research cruise aboard RV Cefas Endeavour and gain experience in the laboratory while analysing the collected field samples.

**Funding notes:** This NERC Industrial Case Studentship in partnership with Cefas has guaranteed funding for 4 years. An annual stipend of £14,296 p/a, plus £1000 p/a from the CASE partner will be available to the successful candidate who meets UK Research Council eligibility criteria. The project includes training and research funding.

For scientific enquiries please contact Dr James Clark ([jcl@pml.ac.uk](mailto:jcl@pml.ac.uk)).

