PML | Plymouth Marine Laboratory

CAMPUS

Combining Autonomous observations and Models for Predicting and Understanding Shelf seas.

An integrated approach combining state-of-the-art computer modelling with innovative observational systems to aid ecosystem-based management.

Shelf seas are of major societal importance as they provide a diverse range of goods and services such as fisheries, renewable energy and transport. Intensive and competing uses can threaten ecosystem health, therefore a comprehensive monitoring system is essential to understand the environment and inform ecosystem-based management.

Through the CAMPUS project PML is leading development of a novel integrated approach to observing networks and marine ecosystem models in conjunction with six UK partners. This will help to deliver better understanding and predictions of fine-scale plankton growth and associated biogeochemical cycles.

The approach unites observational and modelling technologies, combining gliders, satellite observations and numerical models, using "data assimilation" techniques to improve characterisation of episodic events such as the spring bloom, harmful algal blooms and oxygen depletion. These small-scale features are not easily detected by traditional methods but key to understanding ecosystem variability and quantifying good environmental status.

CAMPUS is funded by the UK Natural Environment Research Council Marine Integrated Autonomous Observing Systems programme, exploits the gliders deployment of the twinned project AlterEco and includes the deployment of "smart" autonomous gliders in Plymouth Sound.

> Computer models merging data from marine autonomous vehicles are being used to improve understanding and prediction of shelf seas. The model outputs direct gliders towards areas of concern, such as algal blooms, to inform management decisions in real time.

Dr Stefano Ciavatta
CAMPUS Project Coordinator

CAMPUS is providing the framework to develop a cost-effective optimised and sustained observing network to deliver improved evidence for ecosystem-based marine management.

Ultimately, CAMPUS will improve the understanding, uptake and use of integrated model observation products and observational strategies in support of decision-making. Beyond its core focus on bloom-induced episodic events and variability in NW European Shelf Seas, it will develop methodologies that are transferable and scalable to other applications (e.g. pollution, using marine litter as an example and harmful algae bloom detection) and regions included in UK Official Development Assistance.

The alignment of CAMPUS to societal needs is guaranteed by the engagements of key stakeholders in the project research and development, including, e.g. WWF, UK Defra and the European Copernicus programme.

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