

Marine Ecosystems Connections

Essential indicators of healthy, productive and biologically diverse seas



SmartBuoy - monitoring in near-surface waters



Scanfish tows between the surface and the seabed



Benthic lander - monitoring the seabed

Background

Sustainable human use and exploitation of the products and services provided by the marine environment depends upon clean, healthy, safe, productive and biologically diverse oceans and seas.

International targets have been set for reducing the rate of loss of biodiversity. Our understanding of the link between biodiversity (defined by ecosystem structure) and a healthy functioning system is at an early stage.

Project objective

The project aims to identify key marine ecosystem connections that are susceptible to change, and to develop essential indicators of healthy, productive and biologically diverse European Shelf Seas. This will improve our understanding of marine ecosystems and help the implementation of a sustainable management approach. With an understanding of the impacts of climate change and human activity on the marine environment, we can define the tools required to describe the state of the ecosystem. We can set boundaries for acceptable change which will help to avoid the irretrievable breakdown of ecosystem health.

Approach

To avoid ecosystem dysfunction we need a better understanding of connections between the physical, chemical and biological components of the ecosystem. These connections can be represented by flows of materials (Carbon and Nitrogen) and energy through benthic (seabed) and pelagic (water column) food webs.

We obtain information through a combination of semi-permanent *in situ* monitoring and research cruises. We use GIS-based, ecosystem and trophic-level models to interpret this information. This gives us greater knowledge of the marine ecosystem dynamics, and how they are driven by linkages between climate forcing, hydrography, benthic & pelagic food webs and higher trophic levels (e.g. fish).

This study will contribute to:

- Development of indicators of ecosystem health, productivity and diversity
- An improved evidence base to assessing impacts of environmental change, and human perturbations
- Implementation of ecosystem approach to management of marine resources (e.g. fisheries)
- Provision of sound advice in terms of predicting and managing consequences of environmental variability (e.g. climate change) and human impacts (e.g. Trawling, aggregate extraction, disposal of dredge materials)
- Safeguarding our Seas

This study, funded by Defra, is undertaken by Cefas and research partners. Additional collaboration is welcome. For further information please contact us using the information overleaf.

contact us

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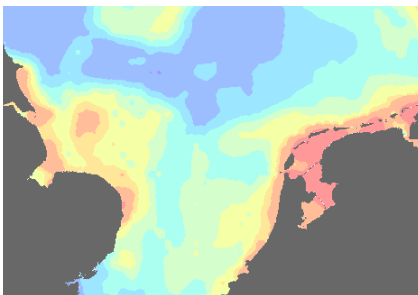
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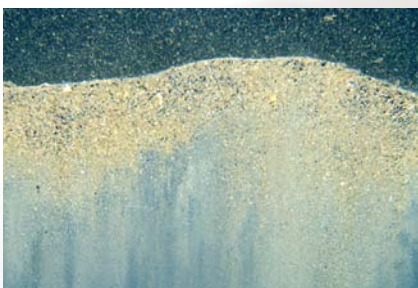
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Model output of total bed shear stresses in the Southern North Sea study area



Sediment Profile Imaging (SPI) camera



Sediment profile image

About us

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We have more than 500 staff based in 3 laboratories, our own ocean going research vessel, and over 100 years of fisheries experience.

We have a long and successful track record in delivering high quality services to clients in a confidential and impartial manner. (www.cefasc.co.uk)

Cefas Technology Limited (CTL) is a wholly owned subsidiary of Cefas specialising in the application of Cefas technology to specific customer needs in a cost effective and focussed manner.

CTL systems are developed by teams that are experienced in fisheries and environmental management and of working closely with clients to ensure that their needs are fully met. (www.cefastechnology.co.uk)

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Our unique facilities and our breadth of expertise in environmental and fisheries management, enable us to rapidly put together a multi-disciplinary team of experienced specialists, fully supported by our comprehensive in-house resources. Our existing customers are drawn from a broad spectrum with wide ranging interests.

Clients include:

- international and UK government departments
- the European Commission
- the World Bank
- United Nations Food and Agriculture Organisation (UNFAO)
- oil, water, chemical, pharmaceutical, agro-chemical, aggregate and marine industries
- non-governmental and environmental organisations
- regulators and enforcement agencies
- local authorities and other public bodies

We also work successfully in partnership with other organisations, operate in international consortia and have joint ventures commercialising our intellectual property.