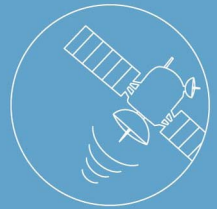


# NATIONAL CENTRE FOR EARTH OBSERVATION



## Providing leadership in monitoring, diagnosis and prediction of the global carbon-cycle

The NERC National Centre for Earth Observation (NCEO) involves over 200 scientists from 26 universities and research establishments. Plymouth Marine Laboratory (PML) leads a national team in 'Theme 2: Monitoring, diagnosis and prediction of the global carbon-cycle'. This continues from the successful, PML-led Centre of Excellence 'Centre for observation of Air-Sea Interactions and fluXes' (CASIX, 2003-2008). Since 2003, CASIX/NCEO activities have contributed to more than 250 papers in ISI journals, in excess of 20 postgraduate studentships, and have had direct input to UK government policy.

### Services provided:

- PML contributes directly to the NCEO National Capability;
- Evidence about how the ocean carbon cycle is changing;
- Development of multi-decadal ocean biogeochemical re-analyses to contribute to an integrated picture of Earth system components;
- Improving ocean ecosystem forecasts over time and from local to global scales;
- Global and regional marine ecosystem model validation;
- Testing new satellite mission concepts for suitability to carbon cycle research and applications.

### Research priorities and objectives:

- Understanding and quantifying ocean carbon cycle processes on global and regional scales, within the context of an integrated Earth system;
- Developing satellite-derived products for tracking key components of the ocean carbon cycle and underpinning the UK capability in satellite ocean colour;
- Scientific development work on an ocean colour fundamental climate data record, supporting the UN Framework Convention on Climate Change;
- Developing understanding of feedbacks between physical and biological processes in order to predict changes in carbon fluxes at the Earth's surface;
- Designing and implementing UK shelf-sea and global ocean biogeochemical data assimilation systems to improve model forecasts;

## Research priorities (continued)

- Development of tools and testbeds for the assessment and implementation of new methods for assimilating Earth observation data into ocean models;
- Improving estimates of uncertainty in models of the ocean carbon cycle and marine ecosystems;
- Exploiting satellite imagery of ocean ecosystems for societal benefit and added-value applications.

## Role in society

Developing an understanding of variability and change in marine ecosystems;

Working with government, agencies and industry to develop innovative uses of the data in science and science applications;

Providing advisory and strategic roles, including membership of international committees such as UNESCO/IOC; Global Ocean and Climate Observing Systems; International Council for Exploration of the Seas; Committee on Earth Observation Satellites;

Capacity building activities within the work plan of the Group on Earth Observation (GEO), including the 'Chlorophyll Globally Integrated Network' (ChloroGIN) and 'Societal Applications for Fisheries and Aquaculture Research' (SAFARI);

Providing postgraduate training and knowledge exchange.

## Delivering in the UK and beyond



PML's work through NCEO is a contribution to the UK NERC's National Capability;

Engaged with the UK scientific user community, government and agencies, in particular the Met Office/Hadley Centre, National Centre for Ocean Forecasting (NCOF), Defra (Department for Environment, Food and Rural Affairs), DECC (Department for Energy and Climate Change), International Space Innovation Centre (ISIC) and UK Space Agency.



Working with international partners, including European Space Agency (ESA), US National Aeronautics and Space Administration (NASA), Japan Aeronautics and Exploration Agency (JAXA), Indian Space Research Organization (ISRO), Korea Ocean Research and Development Institute (KORDI) and Canadian Space Agency (CSA).

## Data access and management

- NCEO data products are archived and disseminated through the NERC EO data centre (NEODC);
- Application of data products is traceable through the allocation of a unique, citable DOI number for each dataset;

- NCEO ocean carbon products contribute to the advanced visualisation displays at ESA's International Space Innovation Centre;
- New NCEO research products have been implemented for operational processing by the NERC Earth Observation Data Acquisition and Analysis Service (NEODAAS).

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