

### Ocean acidification: the other CO<sub>2</sub> problem

Increasing atmospheric carbon dioxide is not only the cause of climate change. It also increases the acidity of the ocean (decreasing pH). This process of ocean acidification is already happening, yet we know little about its impacts and implications.

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Living With Environmental Change



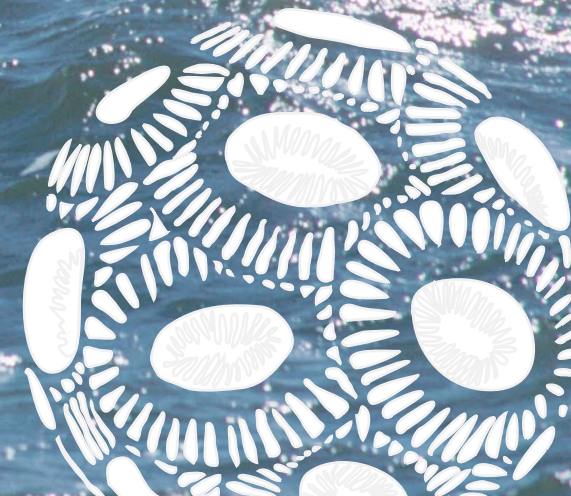
UK Ocean Acidification  
Research Programme

## Understanding and communicating the other CO<sub>2</sub> problem

The UK Ocean Acidification Research Programme (UKOA) is part of the international scientific effort that will:

- reliably measure and predict changes in ocean chemistry, and subsequent effects on marine life, the Earth system and human society
- provide sound data and advice to environmental managers and policymakers, to help mitigate or adapt to the consequences of ocean acidification on marine resources.

UKOA is jointly funded by the Natural Environment Research Council (NERC), the Department for Environment, Food and Rural Affairs (Defra) and the Department of Energy and Climate Change (DECC).



# Working together to understand and communicate ocean acidification

The impacts of ocean acidification could reach far beyond the marine environment, to that of climate, food provision and human health and well-being.

## Vital statistics

The £12m UKOA research programme involves over 120 scientists in 26 research laboratories across the UK. Studies started in June 2010 and the programme will continue until 2015, working closely with European and other international research activities.



Long-term mesocosm experiment

## The Programme

Seven multi-partner consortium projects make up the programme, designed to answer:

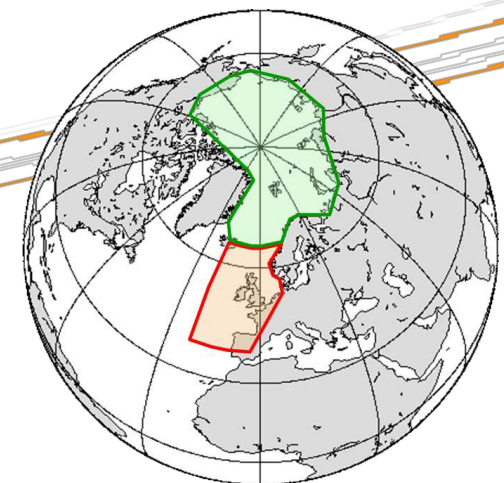
- How much variability is there in oceanic CO<sub>2</sub> uptake and what are the trends for the future? Led by Professor Andrew Watson, University of East Anglia.
- What are the impacts of ocean acidification on key seabed ecosystems, communities, habitats, species and their life cycles? Led by Dr Stephen Widdicombe, Plymouth Marine Laboratory.
- How will ocean acidification affect the biology of surface ocean communities and biogeochemistry, and how might that feedback to climate? Led by Dr Toby Tyrrell, National Oceanography Centre.
- What are the potential impacts of ocean acidification on the ocean and how it might amplify rising CO<sub>2</sub> and climate change? Led by Dr Andy Ridgwell, University of Bristol.
- How will ocean acidification impact ecosystems and chemical cycling in UK and Arctic regional seas? Led by Dr Jerry Blackford, Plymouth Marine Laboratory.
- What were the effects of rapid ocean acidification events in the Earth's past? Led by Professor Paul Pearson, Cardiff University.
- What are the potential impacts of ocean acidification on the life stages of commercially important species, on their associated ecosystems and socio-economics, and their capacity to resist and adapt? Led by Professor Kevin Flynn, University of Swansea.



Organisms of interest include cold water corals (left) and brittle stars

## Programme outcomes

- Provide evidence to the Intergovernmental Panel on Climate Change (IPCC) 5th Assessment Report on Climate Change.
- Provide information to marine bioresource managers, policy makers negotiating CO<sub>2</sub> emissions reduction and other stakeholders.
- Make a significant contribution to the Living With Environmental Change (LWEC) programme.
- Feed into the cross-government Climate Change Adaptation programme.



These projects are supported by the UKOA Knowledge Exchange Office, based at Plymouth Marine Laboratory, and a national carbonate chemistry analytical facility at the National Oceanography Centre, Southampton.

