



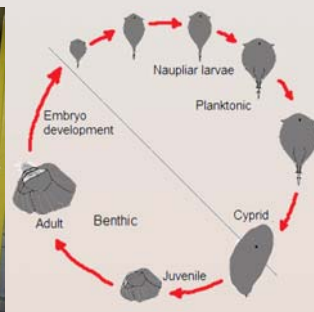
UK Ocean Acidification
Research Programme
Benthic Acidification

UKOA ANNUAL SCIENCE MEETING
ST ANDREWS, 22ND – 24TH JULY 2013

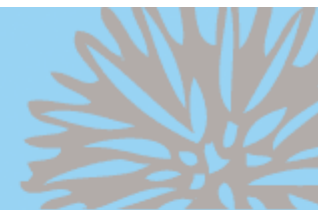


Introduction to the UKOA Benthic Consortium

Steve Widdicombe



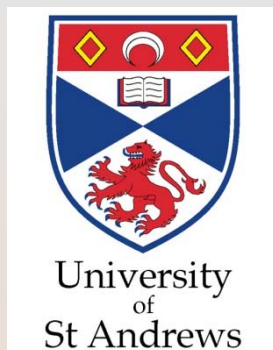
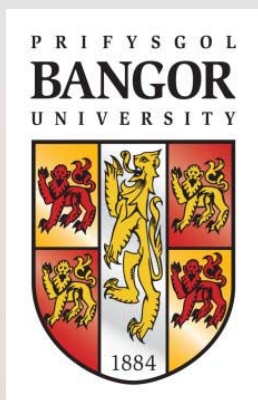
BENTHIC CONSORTIUM



- ❖ 13 Partners
- ❖ 3 year project; 1st July 2010 – 30th June 2013
- ❖ Ecologists, Physiologists, Microbiologists, Biogeochemists, Carbon chemists and Modellers

PML | PLYMOUTH MARINE LABORATORY

UNIVERSITY OF
Southampton





CONSORTIUM VISION



By understanding the effects of elevated CO₂ on the processes, organisms, populations and communities within UK coastal benthic ecosystems, the consortium will

quantify, predict, and communicate

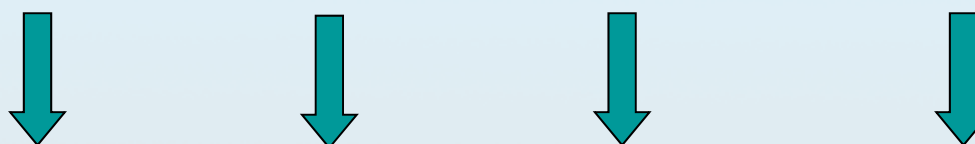
impact of high CO₂ (ocean acidification & warming) on ecosystem functioning and biodiversity.



CONSORTIUM APPROACH



High CO₂
(Ocean Acidification / Warming)



EXPERIMENTS

Biogeo-
chemistry

Organism
Physiology

Behaviour

Communities

PREDICTIONS

Populations

Ecosystem
Function

Biodiversity

END USERS

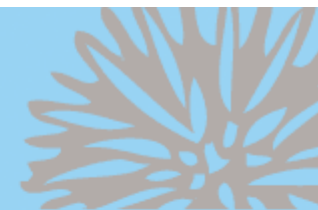
Ecosystem Value

Policy

Society



CONSORTIUM STRUCTURE



Aim 1: Determine the effect of ocean acidification on the performance, life history and population dynamics of individual benthic species.

Task 1.1 Determine the impact of acidification and warming on the function of key species

Task 1.2 Identify the physiological responses that underpin changes in organism performance and function

Task 1.3 Compare the vulnerability of different life stages and model the implications for population dynamics

Task 1.4 Identify the potential for organism resistance and adaptation to prolonged CO₂ exposure

Aim 2: Quantify the impacts of ocean acidification on microbial communities and elemental cycling in coastal ecosystems.

Task 2.1 Determine the impact of acidification on the distribution and fluxes of nutrients in sediment

Task 2.2 Quantify the response of sediment microbial communities and N-cycling functional guilds to high CO₂

Task 2.3 Model the impact of ocean acidification on sediment nutrient cycling and shelf productivity

Task 2.4 Quantify the impact of ocean acidification on biofilms from rocky habitats

Aim 3: Determine the effects of ocean acidification on the overall function of key benthic habitats.

Task 3.1 Sediment habitats

Task 3.2 Calcifying, biogenic habitats

Task 3.3 Rocky, intertidal habitats



UK Ocean Acidification
Research Programme
Benthic Acidification

JOINT ACTIVITIES



Long-term experiments



Flumes



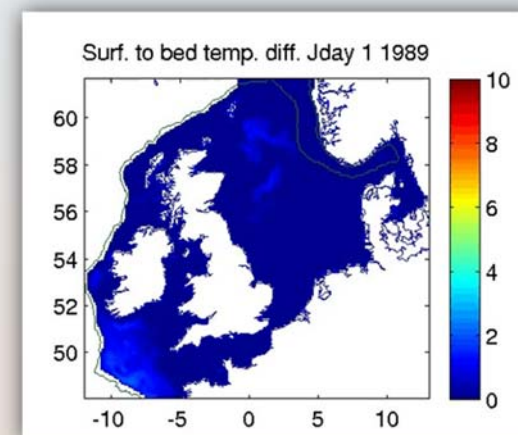
Panels



Natural High CO₂ Sites



“Changing Oceans” Cruise



Models



UK Ocean Acidification
Research Programme
Benthic Acidification

TODAY'S TALKS



Benthic OA impacts at the physiological level

Piero Calosi

From individuals to ecosystems and biogeochemistry

David Paterson

Scaling-up benthic community function, for inclusion in food-web models

Silvana Birchenough

“Changing Ocean” 2012 expedition – and OA impacts on cold-water corals and maerl

Murray Roberts