Integrated **M**arine **B**iogeochemistry and **E**cosystem **R**esearch **www.imber.info**

IMBER Themes and Regional Programmes

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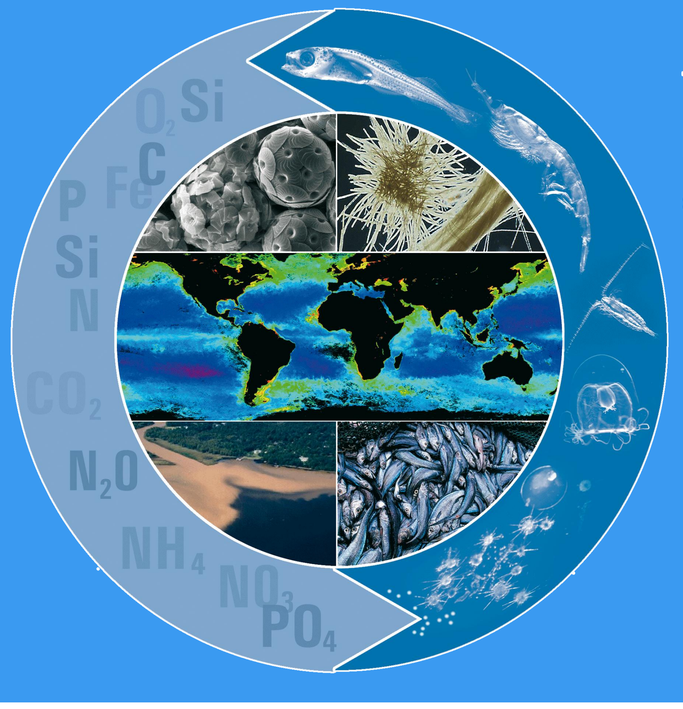
Presented by L. Hu

The goal of IMBER is "**to investigate the sensitivity of marine biogeochemical cycles and ecosystems to global change, on time scales ranging from years to decades**".

Theme 1– Identify and understand the **interactions between biogeochemical cycles and marine food webs** impacted by global change

Theme 2 – Understand the **sensitivity of marine biogeochemical cycles and ecosystems** to and their interactions with global change



Theme 3 – Understand **feedbacks to the Earth System -** Capacity of the ocean to control the climate system

Theme 4 – **Responses of Society** - Understand feedbacks between human and ocean systems including adaptation and mitigation

Ecosystem Studies of Sub-Arctic Seas (ESSAS)

Chairs: K. Drinkwater and F. J. Mueter

www.imr.no/essas

ESSAS addresses the need to understand how climate change affect the marine ecosystems of the Sub-Arctic Seas and their sustainability.

ESSAS conducts research to compare, quantify, and predict the impact of climate variability and global change on the productivity and sustainability of Sub-Arctic marine ecosystems.

Working Groups:

1) **Regional Climate Prediction**
2) **Biophysical Coupling**
3) **Modeling Ecosystem Response**
4) **Gadoid – Crustacean Interactions**

Perspectives

• Provide quantitative estimates and uncertainty of future climate change for the ESSAS regions,

• Develop conceptual, mechanistic/process, statistical/empirical, and simulation models to facilitate comparison of ESSAS ecosystems and to forecast the impacts of climate change on ecosystem structure and function.

• Assess the effects of ocean climate variation and fishing on the interactions between gadoid fishes and crustaceans through a comparative study across multiple sub-arctic marine ecosystems.

Climate Impacts on Oceanic Top Predators (CLIOTOP)

Chairs: A. Hobday and O. Maury

http://tinyurl.com/CLIOTOP

CLIOTOP organises a large-scale worldwide comparative effort at elucidating the key processes and impact of both climate variability and fishing on the structure and function of open pelagic ecosystems and their top predator species. The ultimate objective is the develop a reliable predictive capability for the dynamics of top predator populations and oceanic ecosystems that combine both fishing and climate effects.

Perspectives

→ Emphasis on developing scenarios of the evolution of oceanic ecosystems under anthropogenic and natural forcings in the 21st century, in support of international oceanic ecosystem governance.

Working groups:

1) **Early Life History of Top Predators**
2) **Physiology, Behaviour and Distribution**
3) **Tropic Pathways in Open Ocean Pelagic Ecosystems**
4) **Synthesis and Modelling**
5) **Socio-Economic Aspects and Management Strategies**
6) **Mid-trophic Automatic Acoustic Sampling**

Sustained Indian Ocean Biogeochemical and Ecological Research (SIBER)

Chairs: R. Hood and W. Naqvi

www.incois.gov.in/Incois/siber/siber.jsp

SIBER coordinates international Indian Ocean research to improve our understanding of its role in global biogeochemical cycles and the interaction between these cycles and marine ecosystem dynamics.

Perspectives

→ Develop an understanding of the role of the Indian Ocean in global biogeochemical cycles and the interaction between these cycles and marine ecosystem dynamics.

Key Themes

1) Boundary current dynamics, interactions and impacts

2) Variability of the equatorial zone, southern tropics and Indonesian through-flow and their impacts on ecosystems and biogeochemical cycles

3) Physical, biogeochemical and ecological contrasts between the Arabian Sea and the Bay of Bengal

4) Controls and fates of phytoplankton and benthic production in the Indian Ocean

5) Climate and anthropogenic impacts

6) The role of high trophic levels in ecological processes and biogeochemical cycles

Integrating Climate and Ecosystem Dynamics in the Southern Ocean (ICED)

www.iced.ac.uk **Chair: E. Murphy**

ICED aims to develop a coordinated circumpolar approach to better understand climate interactions in the Southern Ocean, the implications for ecosystem dynamics, the impacts on biogeochemical cycles, and the development of sustainable management procedures

Perspectives

- Develop a coordinated circumpolar approach to better understand climate interactions in the Southern Ocean
- The implications for ecosystem dynamics
- The impacts of biogeochemical cycles
- Development of sustainable management procedures.

Key Themes

1) **Key physical processes affecting the Southern Ocean**
2) **Interaction of physical and biological processes and their effects on nutrient dynamics and biogeochemical cycles in the Southern Ocean**
3) **Structure of Southern Ocean ecosystems**
4) **Southern Ocean ecosystem structure and dynamics in the context of sustainable management plans**
5) **Circumpolar models**

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