Integrated Marine Biogeochemistry and Ecosystem Research

VISION:

To provide a comprehensive understanding of, and accurate predictive capacity for, **ocean responses to accelerating global change** and the **consequent effects on the Earth System and human society**

SCOR International Council for Science Scientific Committee on Oceanic Research

GLOBAL CHANGE IGBP International Geosphere-Biosphere Programme

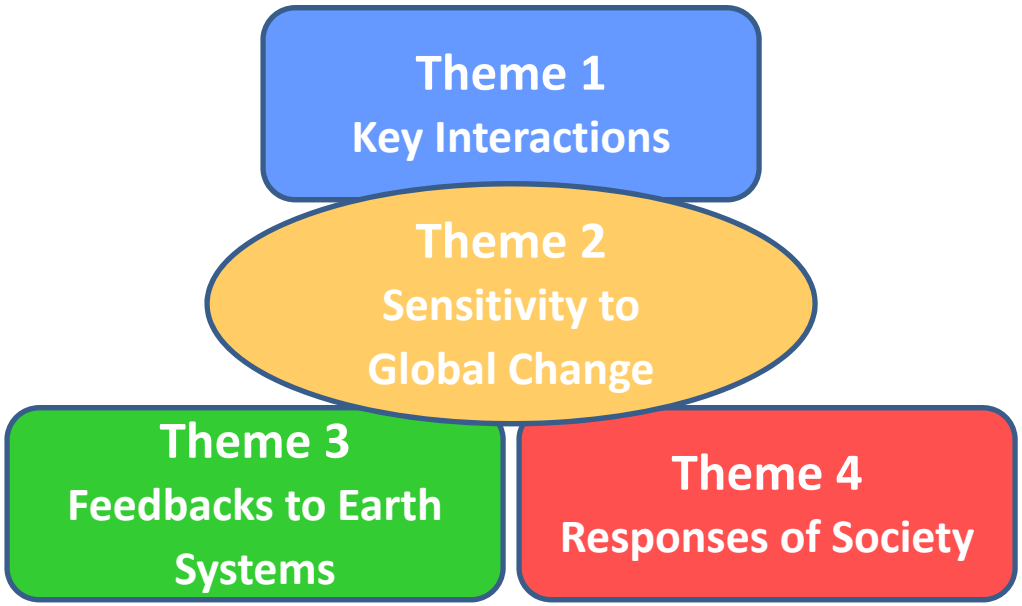
www.imber.info

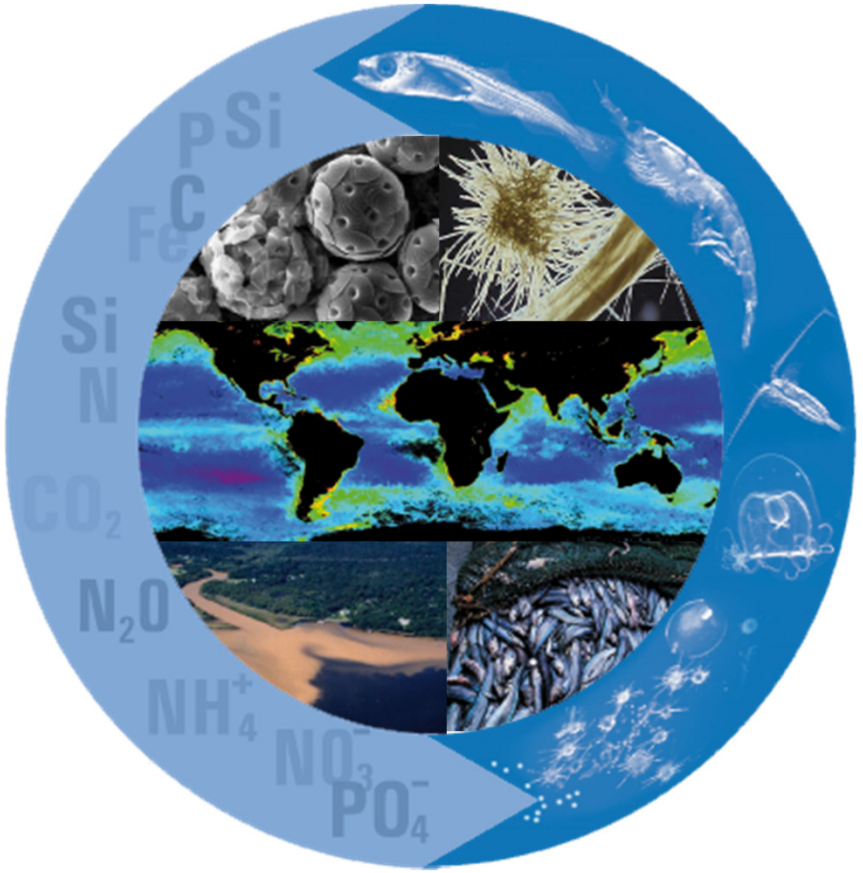
Presentation Outline

- What is IMBER
- Future Earth
- IMBER future plans

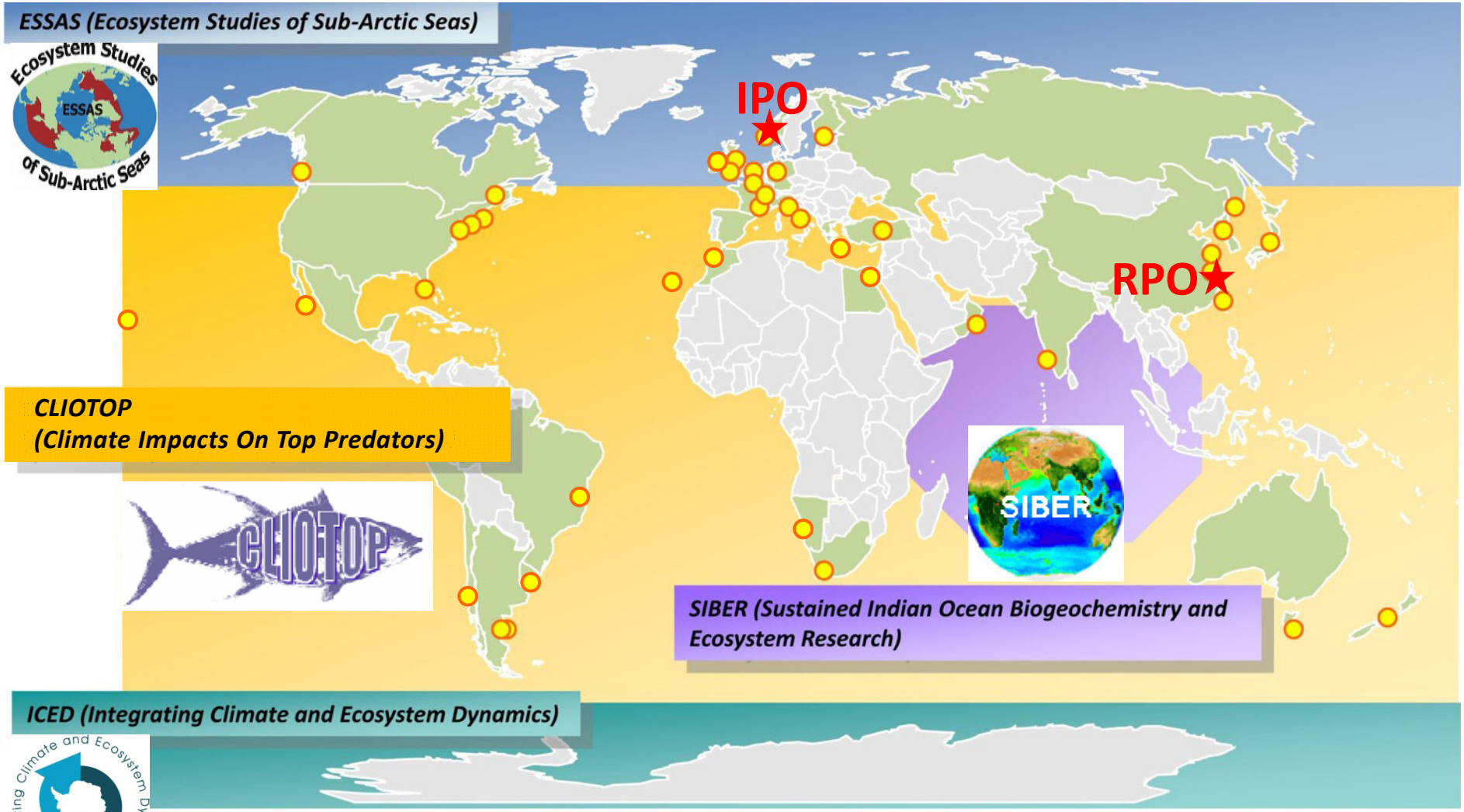
FOUR RESEARCH THEMES

- Interactions between biogeochemical cycles and marine food webs
- Sensitivity to global change
- Feedbacks to the Earth System
- Responses of society





IMBER Regional Programmes, International Network and Working Groups



IMBER Endorsed Projects

National IMBER contacts

Working Groups: • Carbon Research • Human Dimensions • Continental Margins • Data Management • Capacity Building • Upwelling (CLIVAR)

IMBER REGIONAL PROGRMAS

CLimate **I**mpacts on **O**ceanic **TO**p **P**redators (CLIOTOP)
Improved understanding of changes in distribution and abundance of a range of pelagic species at different life stages, and the ecosystem impacts (A. Hobday, K. Weng)

Ecosystem **S**tudies of **S**ub-**A**rctic **S**eas (ESSAS)
Undertaken studies to compare, quantify, and predict the impact of climate variability and global change on productivity and sustainability of these systems (K. Drinkwater, F. Mueter, S.-I. Saitoh)

Integrating **C**limate and **E**cosystem **D**ynamics (ICED) in the Southern Ocean
Assessments of change and quantifying and modelling food webs in the Southern Ocean (E. Murphy)

Sustained **I**ndian Ocean **B**iogeochemistry and **E**cosystem **R**esearch (SIBER)
Facilitated multidisciplinary research throughout the Indian Ocean region, including significant advances and improvements in biogeochemical measurements (R. Hood, M. Roberts)

IMBER WORKING GROUPS

SOLAS/IMBER Carbon (SIC) working group is charged with coordination and synthesis of ocean carbon research

SOLAS/IMBER Working Group on Surface Ocean Systems
Focus on synthesis, instrumentation and technology development, VOS and mixed layer sampling strategy, developed SOCAT Atlas (A. Lenton)

SOLAS/IMBER Working Group on the Interior Ocean Carbon
Coordinates research on ocean interior biogeochemical changes, undertakes synthesis activities, develop sustainable observing systems (ARGO-O2) (N. Gruber)

SOLAS/IMBER Ocean Acidification Working Group
Coordination of international research efforts and synthesis activities in ocean acidification (J. Orr)

IMBER WORKING GROUPS

Capacity Building

Undertake and promote capacity building activities to engage students and researchers in IMBER science at regional and international levels (J. Zhang)

Data Management

Promote good data management practices among the IMBER community and published a guide outlining good for data management practices (A. Piola)

Continental Margins

Conduct integration and synthesis activities to bring together national and regional continental margin research (K.-K. Liu, H. Thomas, LOICZ)

Human Dimensions

Promote the integration of the human dimension into IMBER science; development of a decision support tool, IMBER-ADApT (Assessment based on Description, Responses and Appraisal for a Typology), provides an integrated assessment framework and learning platform for global environmental change response (A. Bundy, M. Isaacs)

Co-conveners: Ingrid van Putten, Xianshi Jin, Stephan Pesant

Focus on indicators to evaluate marine ecosystems and human populations who depend on them in the context of climate change.

Topics:

- ***Climate pressures on marine systems from bio-physical and human perspectives***
- ***Modelling complex systems***
- ***Data access and analysis***
- ***The role of indicators***
- ***Using and communicating different indices for policy***

IMBER Project Is:

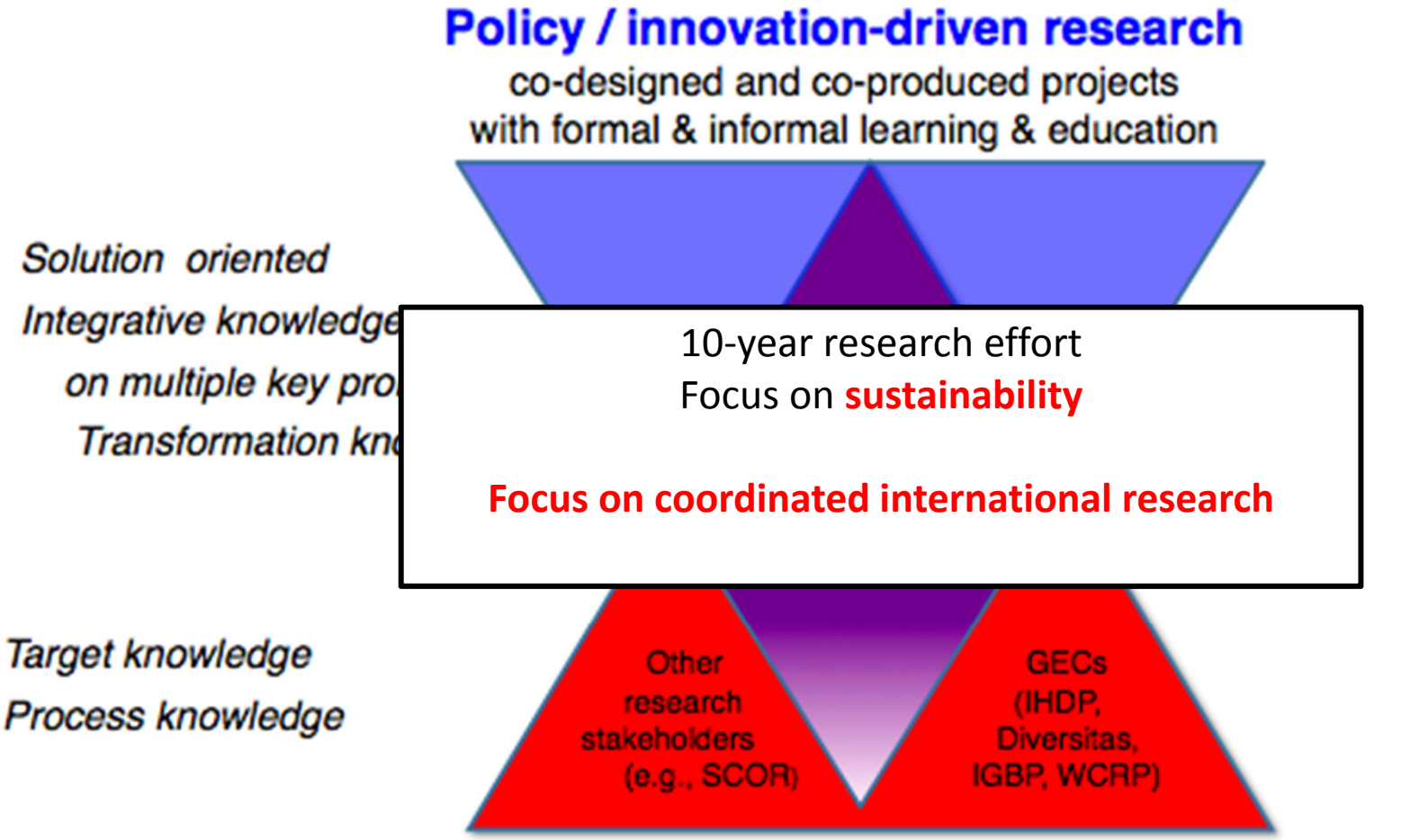
- ✓ A strong research community with a focus on marine biogeochemical cycles and ecosystems and responses to global change
- ✓ An integral part of the larger global environmental change research programs
- ✓ Bringing together natural and social science communities to study impacts and feedbacks between marine and human systems

→ An integrated and interdisciplinary global environmental change project, already interconnecting natural and social sciences, and achieving progress at different spatial and temporal scales, with local, regional and global focus

But Things Are Changing

- ✓ IMBER is approaching a ten-year mark and it is time to reconsider science directions
- ✓ Co-sponsor IGBP is ending at end of 2015
- ✓ Transition from IGBP to Future Earth to be completed by end of 2015
- ✓ IMBER submitting request to SCOR for a 10-year extension

FutureEarth aims to combine two approaches



futureearth
research for global sustainability

Future Earth Transition

- ✓ Science Steering Committee appointed with Mark Stafford Smith as chair
- ✓ Engagement Committee appointed to provide link to stakeholders, policy and management - Bob Watson appointed as chair
- ✓ Coordination is through a distributed secretariat with five hubs in Canada, France, Sweden, Japan, US (University of Colorado-Boulder, Colorado State University)
- ✓ Four regional hubs in Cyprus, Japan, United Kingdom, and the Inter-American Institute for Global Change Research in Uruguay

Future Earth Transition

- ✓ IGBP ending in 2015 – planning an 'IGBP Celebration' at Fall 2015 AGU Meeting
- ✓ Synthesis/legacy products are being prepared (focus on Anthropocene, synthesis of results from core projects)
- ✓ Core projects sponsored by IGBP have been invited to join Future Earth
- ✓ IGBP – eight projects; three with marine focus (LOICZ, SOLAS, IMBER)
- ✓ IMBER is preparing a document for transition to Future Earth and also a request to SCOR for a 10-year extension

- ***Future Oceans: Research for marine sustainability: multiple stressors, drivers, challenges and solutions***
- Highlight and synthesize IMBER science achievements
- Integrate IMBER science to provide a basis for developing a science plan for the next decade of research
- Science plan will be basis for request to SCOR for an extension and for transition to Future Earth
- **Community engagement**

IMBER Way Forward

- In early 2014 inputs were solicited from IMBER regional programs, working groups and partner organizations about achievements and suggestions for new research directions
- Inputs were collated by the IPO staff, OSC organizing committee and executive committee and developed into a **DRAFT** position paper that was provided OSC participants
- Outline the key scientific issues and challenges relating to the ocean and global environmental change and how IMBER can address these in the next 10 years
- Draft paper available for comment on IMBER OSC website (http://www.imber.info/index.php/Meetings/IMBER-OSC-2014)

Final Comments

- Environmental issues facing society, particularly those relating to global environmental change, are at the interface between natural and social sciences and humanities, where the understanding provided by curiosity-driven natural science merges with problem-driven, social science research and the many feedbacks from human responses
- The IMBER community is well poised to take the lead in developing this area of research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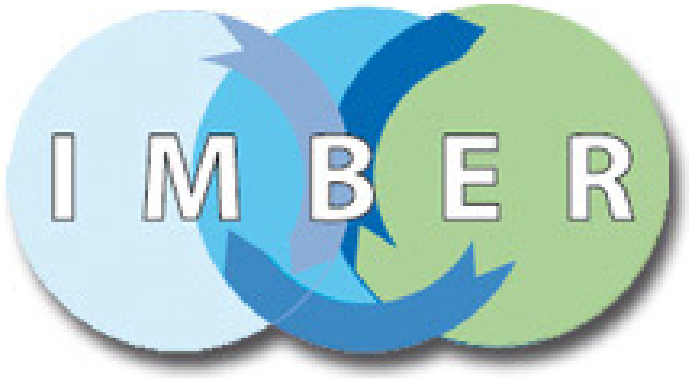
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THANKS


International Council for Science
SCOR
Scientific Committee on Oceanic Research


GLOBAL
IGBP
CHANGE