

IMBER Annual Report to SCOR August 2009

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Working groups

IMBER has developed five working groups or task teams which are active in the development and implementation of IMBER.

1 IMBER/SOLAS Carbon (SIC!) Working Group

The joint IMBER/SOLAS Carbon Working Group has recently been restructured. The Chairs of the three sub-groups now report directly to the IMBER and SOLAS SSCs and work closely with the International Ocean Carbon Coordination Project (IOCCP). The Joint SOLAS/IMBER Carbon Research Implementation Plan is available at (http://www.imber.info/products/Carbon_Plan_final.pdf).

Sub-group 1 (SG1) Surface Ocean System (Leader: Are Olsen, Norway)

SOLAS is currently developing new Terms of Reference for this sub-group. Are Olsen is replacing Nicolas Metzger as Chair of the group. The need for a surface CO₂ database was recognised at the SOLAS Open Science Conference in Xiamen, China in 2007 and activities of the group have focussed on achieving this. The SOCAT database will be released in late 2009. A *Deep-Sea Research II* special issue: *Surface Ocean CO₂ Variability and Vulnerabilities* was published in April 2009 (Vol. 56, Nos. 8-10) (<http://www.sciencedirect.com/science/journal/09670645>)

Sub-group 2 (SG2) Ocean Interior (Leader: Nicolas Gruber, Switzerland)

New Terms of Reference are currently being developed and membership of the group is to be increased. The group deals with inventory and observations, natural variability and transformation. Its aim is to determine the uptake, transport and storage of anthropogenic CO₂ on decadal timescales.

As part of the global synthesis SG2 organised the *Decadal Variations of the Ocean's Interior Carbon Cycle: Synthesis and Vulnerabilities* symposium at the Centro Stefano Franscini in Ancona (Switzerland) on 13-17 July 2009. Its aims were to synthesise ocean observations to obtain an estimate of oceanic uptake of anthropogenic CO₂ since the WOCE period and to identify changes in observation strategies.

Following the rationale that oxygen is very sensitive to global change, a pilot program—Oxywatch O₂ (putting oxygen sensors on Argo floats)—was developed. A White Paper was developed and Argo floats with O₂ sensors are currently being tested. A Community White Paper has been accepted for OceanObs'09, where the sub-group Chair, Niki Gruber, will deliver the keynote address.

Another activity related to this sub-group is the CARbon dioxide In the North Atlantic (*CARINA*). *CARINA* was started in June 1999 with the objective to collect carbon-relevant data sets in the North Atlantic Ocean and to form a consistent, quality-controlled data base for the Atlantic (including the Southern and Arctic ocean). The second quality control exercise was recently completed and the manuscript is soon to be submitted to *Earth System Science Data*.

Sub-group 3 (SG 3) Ocean Acidification (Leader: Jean-Pierre Gattuso, France)

The third IMBER/SOLAS Carbon Research sub-group on Ocean Acidification has recently been launched (August 2009) (http://www.imber.info/C_WG_SubGroup3.html).

The tasks of the group are to

1. coordinate international research efforts in ocean acidification, and
2. undertake synthesis activities in ocean acidification at the international level.

The group's first meeting will identify and prioritise topics for immediate attention, with proposed deliverables and a plan to achieve them.

2 Continental Margins Task Team

The IMBER/LOICZ Continental Margins Task Team was developed to link the two projects at the continental margins. The current Task Team is co-chaired by Jack Middelburg (The Netherlands) and Nancy Rabalais (USA). The group organised a Continental Margins Open Science Conference at the East China Normal University in Shanghai on 17-21 September 2007 (<https://www.confmanager.com/main.cfm?cid=792>). The draft Continental Margins Science Plan that resulted from this conference has recently been submitted. A team from the IMBER and LOICZ SSCs has been tasked with finalising the document and developing a paper to guide the Continental Margins biogeochemistry and ecosystems research going forward. The team leader is Katja Philippart.

IMBER is currently in the process of establishing an IMBER project office in China which will take the lead for Continental Margins activities. The organisation of a dedicated Continental Margins IMBIZO is being considered.

3 Capacity Building Task Team

The Capacity Building group was set up at the start of IMBER to ensure that capacity building initiatives were included in all IMBER projects. Its mission is to assist developing countries to develop research initiatives and to provide involvement in IMBER activities and training for young and developing country scientists. Another objective is to enhance research capabilities globally in those IMBER activities that have few practitioners but are crucial for optimal implementation of the IMBER Science Plan. The task team is chaired by Jing Zhang. A capacity building strategy and implementation plan has been developed (http://www.imber.info/products/Capacity_Building_final.pdf). Membership of the task team is currently being reviewed and additional members from developing countries have been invited to join.

IMBER is represented on the SCOR Capacity Building Committee by Jing Zhang (see <http://www.scor-int.org/capacity.htm> for details), who is hosting a meeting of the committee in Shanghai immediately before the SCOR Executive Committee meeting.

The IMBER Capacity Building Task Team, with financial support from EUR-OCEANS, organised the *Analyses of end-to-end food webs and biogeochemical cycles* Summer School in Ankara, Turkey in August 2008 (http://www.imber.info/E2E_EcoModel_programme.html). Lectures, discussions, poster sessions and practical modelling training simulations provided the 21 participants (PhD students and Post-docs working with biogeochemical cycles and end-to-end food webs) with an overview of the methods and models that are available. Live web-broadcasting opened the presentations and discussions to participation by many more students and scientists around the world.

The Summer School has proved to be a successful capacity building exercise and consequently plans are well underway to hold the next one in August 2010 at the Institut Universitaire Européen de la Mer in Brest, France. The preliminary title is *Marine ecosystems in the context of climate change: dynamics and impacts*.

4 Data Management Task Team

The IMBER Data Management Committee (DMC) is currently chaired by Raymond Pollard (UK) with Alberto Piola (Argentina) replacing him at the end of the year. The DMC promotes a cooperative data management approach that includes involving experienced data management specialists from the start of a project, and also training young scientists in good data management procedures.

The DMC has produced a draft Data Management Policy and *The Benefits of Integrated Data Management* document. They are currently under review.

Prior to IMBIZO 1 in November 2008 in Miami (USA), the DMC held the *BEER - Being Efficient and Environmentally Responsible* training workshop, which highlighted the benefits of adding a data integration scientist to projects. Participants were given the opportunity to test some of the “recipes” for using data integration concepts and handling techniques in the IMBER Data Integration “Cookbook”. Very positive feedback was received regarding the “Cookbook” which has now been published.

The DMC have also set up a data management portal on the IMBER website and coordinated the development of a metadata portal which is hosted by GCMD.

5 End-to-end food web Task Team

The joint IMBER-GLOBEC End-to-end food web Task Team was co-chaired by Coleen Moloney (South Africa) and Mike St John (Germany). It has completed its mandate and produced draft manuscripts and was disbanded in 2008. One paper has been submitted to the DSR Special Issue from the IMBER IMBIZO and is currently under review. The other requires some revision. Coleen Moloney and Mike Roman co-chaired the *Ecological and Biogeochemical Interactions in End-to-end Food Webs* workshop at IMBIZO 1 which considered

- the relative impacts of change on material cycles through predator-prey interactions (top-down perspective), and
- the indices that should be used to describe material transfer from photosynthesis to fisheries (bottom-up perspective).

A new team is to be established to deal with end-to-end activities for IMBIZO II. It has been proposed that they organise a topic-focused mini-workshop a few months prior to the IMBIZO to do a comparative study which would provide a synthesis to feed into the IMBIZO.

The End-to-end team was involved in the organisation of the Summer School on *Analyses of the interactions between end-to-end marine food webs and biogeochemical cycles*, which was held in Ankara, Turkey in August 2008.

Regional Projects

An IMBER/GLOBEC Transition Task Team (TTT) was appointed by SCOR and IGBP to recommend how IMBER should accommodate new developments in marine ecosystem research that need addressing post-GLOBEC. The Task Team met in Reading, UK from 30 July to 1 August and in Washington DC on 15-17 December 2008. The final TTT report will be published as an addendum to the *IMBER Science Plan* in September 2009.

After considering the Transition Team Report, the IMBER SSC decided to invite all continuing GLOBEC projects to become part of the IMBER project. To date, CLIOTOP and ESSAS have accepted this invitation.

Climate Impact on Top Oceanic Predators (CLIOTOP)

CLIOTOP was started as a regional programme under GLOBEC in 2005. It aims to provide a global comparison of the impact of climate variability (at various scales) and fishing on the structure and function of open ocean pelagic ecosystems and their top predator species, and from this to develop reliable predictive capacity. CLIOTOP is co-Chaired by Patrick Lehodey and Oliver Maury and there are five working groups. The Science Plan and Implementation Strategy were accepted by GLOBEC in 2005.

The CLIOTOP mid-term workshop [is planned for late 2009 and will involve IMBER SSC members](#).

Ecosystem Studies of Sub-Arctic Seas (ESSAS)

ESSAS was developed in conjunction with GLOBEC and EUR-OCEANS in 2005 and focuses on comparative studies of the impacts of climate variability on the productivity and sustainability of Sub-Arctic marine ecosystems. There are four working groups and several national and multi-national projects. The Science Plan and *Background to the Climatology, Physical Oceanography and Ecosystems of the Sub-arctic Seas* document were produced in 2005.

ESSAS and PICES co-sponsored the *Marine Ecosystem Model Inter-comparisons* workshop on 25 October 2008, in Dalian, China. The ESSAS Annual Science Meeting [was held in Seattle, Washington, USA on 18-19 June 2009](#).

Integrating Climate and Ecosystems Dynamics (ICED)

ICED is currently an IMBER/GLOBEC project with a partnership with EUR-OCEANS. It aims to determine the main control of Southern Ocean ecosystem dynamics and potential for feedbacks as part of the Earth system. Its Science Plan, which was accepted by both IMBER and GLOBEC, was published in 2008.

At the first ICED modelling workshop, held in April 2008, there was consensus that understanding of the structure of food webs at regional and circumpolar scales was needed to be able to improve the reliability of predictions of ecosystem dynamics in the Southern Ocean. This put the focus on Southern Ocean ecosystem modelling, with particular emphasis on cross-disciplinary studies. In June 2009, the *New Frontiers in Southern Ocean Biogeochemistry and Ecosystem Research* workshop was held at Princeton University in New Jersey, USA. It aimed to facilitate interaction between the physical, biogeochemical, and ecosystem research communities to develop research strategies to resolve current limitations, gaps and discrepancies in our understanding and prediction of the Southern Ocean ecosystems, biogeochemical cycles and carbon uptake.

To provide a central focus for fieldwork planning and coordination activities in the Southern Ocean, across all disciplines, for the next decade, ICED is developing a series of interactive maps representing Southern Ocean research

The first Southern Ocean Sentinel Workshop took place in April 2009 in Hobart, Australia, to consider how to measure, assess and provide early-warning of climate change impacts on the Southern Ocean and how these could be used to signal future impacts on marine and other ecosystems elsewhere in the world. The workshop proceedings, outcomes and a strategic plan will be published. The second Sentinel Workshop is planned for 2010.

Sustained Indian Ocean Biogeochemical and Ecological Research (SIBER)

SIBER is a developing regional program of IMBER that aims to understand climate change and anthropogenic forcing on biogeochemical cycles and ecosystems in the Indian Ocean. A planning workshop was held at NIO in Goa, India on 13-14 April 2009. The draft Science Plan and Implementation Strategy is currently being reviewed.

Endorsed Projects

IMBER now has 17 endorsed projects from 12 different countries. The following projects were endorsed by IMBER this past year.

- *BOUM Biogeochemistry from the Oligotrophic to the Ultra Oligotrophic Mediterranean Sea*
Leading applicant: Thierry MOUTIN (France)
- *CAIBEX Shelf-ocean exchanges in the Canaries-Iberian Large Marine Ecosystem*
Leading Applicants: Eric D. Barton and Javier Arístegui (Spain)
- *CROZEX CROZet Natural Iron Bloom and EXport Experiment*
Leading applicant: Raymond Pollard (UK)
- *EPOCA European Project on Ocean Acidification*
Leading applicant: Jean-Pierre Gattuso (France)
- *Fisheries Oceanography Project*
Leading applicant: Matt Pinkerton (New Zealand)
- *GENUS Geochemistry and Ecosystem Research in the Namibian Upwelling System*
Leading Applicant: Kay Emeis (Germany)
- *MALINA What is the impact of the decrease in sea ice, increase in UV radiation, and permafrost thaw on microbial biodiversity and biogeochemical fluxes in the Arctic Ocean?*
Leading applicant: Marcel Babin (France)
- *Oceans 2025 UK Strategic Marine Science Programme*
Leading applicant: Phil Williamson (UK)
- *OMMIX Food-Web structure and carbon budget in a coastal area off Central Chile (36°S): Influence of mixotrophy and omnivory.*
Leading applicant: Cristian A. Vargas (Chile)
- *POMAL Population Outbreak of Marine Life*
Leading applicant: Hiroaki Saito (IMBER-Japan)
- *SACC An International Consortium for the Study of Oceanic Related Global and Climate Changes in South America*
Leading applicant: Alberto Piola (Argentina)

OUTREACH ACTIVITIES

IMBER website

The IMBER website (<http://www.imber.info/>) is the project's main communication tool. In the interest of ensuring that information is kept up-to-date and to improve communication links, the website will be redesigned soon.

The IPO also developed and maintained several other activity-based websites, for example, for the CLIMECO workshop, IMBIZO 2008, E2E EcoModel Summer School, the IMBER data portal, and the IMBER/SOLAS

French meeting. The website for IMBIZO 2010 is under construction. There are also plans to develop an Ocean Acidification website to support the activities and findings of the IMBER/SOLAS SG3.

IMBER Update

The electronic newsletter "*IMBER Update*" is published three times a year. The most recent edition was published in July 2009. Included in the newsletter are IMBER science highlights, reports of the activities of the IMBER working groups and IMBER endorsed and contributing projects, regional and national programme reports, and upcoming IMBER-related conferences and workshops. The IMBER Update can be downloaded at <http://www.imber.info/newsletters.html>.

eNews

The eNews bulletin is published monthly to circulate information about IMBER activities and activities within the IMBER scientific network. Included in the publication are calls for funding, job opportunities, conferences and workshops.

IPO Report to SSC

As the SSC only meets once a year, every two months the IPO sends a report to IMBER SSC members to keep them up to date about IMBER activities and developments. This report includes IPO activities, news from the IMBER working groups, IMBER meetings, workshops and conferences, IMBER contributing, regional and national projects, sponsored activities, communication and interactions with our sponsors.

Promotional Material

The IPO has promotional material that can be sent to meetings or conferences that IMBER representatives are attending or holding. The IMBER brochure and posters introduce the global scientific context of IMBER and present the four themes of the program. Information regarding how to get involved and how to contact the International Project Office (IPO) are also included. Both the brochure and poster can be downloaded from the IMBER website (<http://www.imber.info/useful-downloads.html>) and are available on request at the IPO. A new poster will be produced shortly, that will illustrate the direction that IMBER science is moving towards with the introduction of the new regional programmes that are being incorporated into the program.

The IPO recently updated a PowerPoint presentation about the structure and activities of IMBER which can be adapted by representatives for meetings and conferences.

Training

Summer School in Ankara

The IMBER/EUR-OCEANS *Analyses of End-to-end Marine Food Webs and Biogeochemical Cycles* Summer School was held at the Middle East Technical University, Ankara (Turkey) on 11-16 August 2008. The aim was to provide an overview of methods, models and approaches for analyzing the interactions between marine biogeochemical cycles and end-to-end food web studies. There were two topics: *Main processes controlling marine food webs* and *Advances in end-to-end food web modelling*. Theoretical lectures, practical workshops were given for each topic. Discussion and poster sessions were used to stimulate interaction amongst the students and also between students and the lecturers. Debates on hot topics pertinent to end-to-end ecosystem research were also organised.

INTERNATIONAL PROJECT OFFICE (IPO)

The IMBER IPO is located at the Institut Universitaire Européen de la Mer (IUEM) in Brest, France. There are currently three staff members at the IPO. Lisa Maddison replaced Sylvie Roy as Executive Officer in April 2009. Sophie Beauvais is the Deputy Executive Officer, and a new Administrative Assistant will be appointed soon.

The IPO is primarily responsible for carrying out IMBER SSC decisions, obtaining funding to support IMBER activities, providing support for the IMBER working groups and task teams, providing administrative support

for the program's activities, maintaining communication links both within and outside the program, and maintaining a data and information archive.

The IPO is funded by a French consortium comprising the University of Brest, IUEM, the Region of Brittany, Ifremer, the Conseil Général de Bretagne (Department authorities) and the City of Brest, Centre National de la Recherche Scientifique (CNRS), Institut de Recherche pour le Développement (IRD), Université de Bretagne Occidentale (UBO).

In 2008-2009, IMBER activities and the IPO received the following sponsorship:

- IGBP: support for the SSC meeting (\$16K annually);
- SCOR: support from NSF (\$50K annually, renewed until 2011);
- French Consortium: support for IPO salaries and running expenses (\$284K)

The French consortium agreed to provide further funding to hire additional staff members to support the increased workload of the IPO after April 2010 when the regional projects from GLOBEC become part of IMBER. A meeting will be organised shortly with the French consortium to discuss the way forward for the IMBER IPO in light of the recommendations of the GLOBEC/IMBER Transition Task team.

INTERACTIONS WITH OTHER PROJECTS AND PROGRAMMES

SOLAS

Joint SOLAS/IMBER Carbon Research group (SIC!): the joint IMBER and SOLAS carbon implementation group has been restructured (see section on IMBER/SOLAS Carbon Working Group above). The Chairs of the three sub-groups work closely with each other and also with the IOCCP (International Ocean Carbon Coordination Project).

The first IMBER/SOLAS French Meeting was held at the University Paris 7 on 22-23 June 2009 to inform the community about the marine science being undertaken by French IMBER and SOLAS scientists. The main objectives were to highlight the scientific questions common to IMBER and SOLAS and to develop new collaborations. The meeting was organized by Véronique Garçon (LEGOS, Toulouse), Jean-Pierre Gattuso (LOV, Villefranche/Mer), Cécile Guieu (LOV, Villefranche/Mer), Rémi Losno (LISA, Paris) and the IMBER International Project Office (IUEM, Brest) and financed by [LEFE-CYBER](#). There were six sessions:

1. "[Nutrients and marine ecosystems](#)",
2. "[Atmospheric aerosols](#)",
3. "[Anthropogenic carbon and acidification](#)",
4. "[Biogeochemical cycles and marine ecosystems](#)",
5. "[Transversal actions](#)", and
6. "[Trace gases and CO₂](#)".

Sixty participants from 14 French laboratories and institutions attended. It gave PhD and young scientists the opportunity to present their work to the national marine science community. Some of the presentations are available at (http://www.imber.info/IMBER_SOLAS_Programme.html).

LOICZ

Joint IMBER/LOICZ Continental Margins Task Team (CMTT): acknowledging the amount of research in continental margins IMBER has suggested that the existing CMTT be disbanded and a new one established to conduct integration and synthesis activities to draw together the national and regional research. A team of eight members, jointly appointed and funded by IMBER and LOICZ, with a representative co-chair from each project is envisaged. The team will develop perspective or white papers to stimulate integration and synthesis activities. Several knowledge gaps have been identified, including carbon and nutrient budgets for shelf seas and the role of the "continental margin pump", the differential role of physical processes in the exchange of water and biological properties between the coast and the open ocean, the effect of global warming on the

occurrence and extension of low oxygen zones, and their effects on biogeochemistry, marine ecosystems and ecosystem services (e.g. fisheries yields) and basin-to-basin variation in food web structure and functioning.

The new CMTT will meet before the end of 2009 to develop plans for the first integration and synthesis activity, possibly a “Continental Margins IMBIZO” to be held early in 2011.

Carbon and Nutrient Fluxes in Continental Margins: A Global Synthesis, Edited by Kon-Ke Liu, Larry Atkinson, Renato Quiñones and Liana Talaue-McManus has been published by Springer Verlag in the IGBP Book Series on Global Change. The book provides perspectives on the role of continental margins in the Earth's biogeochemical system as well as highlights of biogeochemical functionality in representative regional settings. More than 150 experts contributed best estimates of carbon and nutrient fluxes in seven types of continental margins.

GLOBEC

Joint IMBER/GLOBEC End- to-End Task Team: See section on End-to-end food web Task Team above.

CARBOOCEAN

A Memorandum of Understanding was signed between IMBER and CARBOOCEAN, an integrated project that aims to provide an accurate assessment of marine carbon sources and sinks with special emphasis on the Atlantic and Southern Oceans on a time scale of -200 to +200 years. All five of the core CARBOOCEAN themes contribute to IMBER's goals. For example, the North Atlantic surface ocean carbon observing system confirmed the decrease in uptake strength for anthropogenic CO₂ from the atmosphere in the late 1990s. The Southern Ocean sink has also weakened during the recent years. Among the modelling studies, an investigation on a quick transfer of anthropogenic CO₂ into deep oceanic areas close to deep water production locations show that the ocean acidification not only affects the surface ocean, but also has implications for deeper ocean areas. CARBOOCEAN has contributed to two data synthesis efforts for a global surface ocean pCO₂ data set of raw data (no climatology) and an Atlantic 3-D carbon database.

CLIVAR

Climate Variability and Predictability (CLIVAR) is a core project of the World Climate Research Programme (WCRP), with a particular focus on the role of the ocean in climate variability and change. There are IMBER representatives on the relevant CLIVAR Panels. Following the successful ClimEco (Climate driving of marine ecosystem changes – training for young marine scientists) Workshop in Brest, France in April 2008, CLIVAR organised an NCAR Advanced Study Programme Workshop on “Marine ecosystems and climate - modelling and analysis of observed variability” in Boulder, Colorado, USA on 2-14 August 2009. CLIVAR, together with IOCCP and the joint SOLAS/IMBER Carbon Group, participates in the Global Ocean Ship-based Repeat Hydrographic Investigations Panel (GO_SHIP) which is developing a strategy for a sustained program of interdisciplinary repeat hydrography.

EUR-OCEANS

IMBER signed a Memorandum of Understanding with the EUR-OCEANS Network of Excellence and continues to maintain strong links with the self-funding EURO-OCEANS Consortium. The Consortium has allocated funding for the IMBER IMBIZO II in 2010.

GODAE

The IMBER-GODAE Task Team, established in June 2007 focused on three key areas:

- (1) How IMBER modellers can benefit from the data products and insight generated by GODAE,
- (2) How GODAE products can be improved from the perspective of IMBER modellers, and
- (3) How to improve ocean observation systems to observe ocean ecosystem and biogeochemistry better.

The Task Team produced a synthesis paper in 2008 that focused on the applications of GODAE products to ecosystem and biogeochemistry projects and identified what is required to integrate biogeochemistry and

ecology into ocean data assimilation systems. The paper was presented at the final GODAE Symposium on 12-15 November 2008 in Nice, and has been submitted for publication. The Symposium proceedings can be viewed at (<http://www.godae.org/Invited-papers.html>). The meeting report was also published in IMBER Update n°12.

A White Paper about the future of GODAE was also presented at the Nice Symposium, providing the basis for an international program called GODAE Ocean-View (GOV) which will consolidate the long-term coordination and cooperation on ocean analysis and forecasting. The Marine Ecosystem Analysis and Prediction Task Team (MEAP-TT) is one of several GOV task teams that have been established and it is likely that the IMBER-GODAE Task Team will be dissolved and absorbed into the MEAP-TT.

PICES

The PICES interdisciplinary programme FUTURE, aims to forecast and understand the trends, uncertainty and responses of North Pacific marine ecosystems to climate change and human activities at basin-wide and regional scales. The FUTURE Science and Implementation Plan was published in May 2009 (see http://www.pices.int/members/scientific_programs/FUTURE/FUTURE_final_2008.pdf) FUTURE provides for collaboration between IMBER and PICES.

National activities

IMBER activities are underway in many different countries (e.g. Chile, China, France, Germany, India, Japan, Korea, New Zealand, Norway, Spain, Turkey, UK, and USA). Some examples include

- **China:** the five-year IMBER-GLOBEC Marine Dynamics project is now in its third phase. The IMBER-GLOBEC community is very active and there are plans to open an IMBER-China office next year.
- **Japan:** IMBER-Japan, established under the Science Council of Japan is chaired by Hiroaki Saito. The Population Outbreak in Marine Life (POMAL) project is an IMBER project focusing on cruises investigating the integration of biogeochemical cycles. Two cruises are planned over the next three years. SUPRFISH AND STOPJELLY are also IMBER-related projects.
- **Korea:** Although there are no formal IMBER projects in Korea, about ten current projects could be IMBER-related. The next symposium of the GLOBEC committee (members from China, Korea and Japan) will be held in Korea and consideration will be given to transforming it into an IMBER-related group and establishing a Korean IMBER research project. The Chair of IMBER has been invited to attend this meeting.
- **France:** CYBER has submitted several proposals for IMBER-related projects. The SOLAS-IMBER meeting for the French community was held in June 2009 in Paris.
- **India:** SIBER recently organised a workshop where a national committee was established which could function as an IMBER committee.
- **Spain:** There are many IMBER-related activities in Spain. The most relevant are MALOSPINA – a five-year global circumnavigation exploration of global change and biodiversity of the oceans and SUMMER – a surface mixing modulation study. Two symposia were held recently: the *International Symposium on the Effects of Climate Change on the Worlds Oceans* and the *Eastern Boundary Upwelling Ecosystems Symposium*.
- **UK:** The process to develop IMBER-UK has started (see www.imber-uk.org). Several session reports relate to the IMBER themes. There has been an 11 million GBP call for proposals on Ocean Acidification. IMBER science in the Arctic is developing and several aspects in the Southern Ocean are linked through ICED.
- **USA:** Ocean Carbon and Biogeochemistry (OCB) is the U.S. contribution to IMBER.

FUTURE ACTIVITIES

- As part of the IMBER IMBIZO series, IMBIZO II is scheduled for September/October 2010. The meeting will be held in the Creteaquarium on the island of Crete in Greece. As with the previous IMBIZO, the meeting will consist of three interdisciplinary workshops held in parallel, plenary and poster sessions. Workshops will include oral presentations showing current research and knowledge about each topic and discussion sessions to identify key questions to be addressed by IMBER. The workshops will be limited to 40 participants each and funding will be available for some scientists from developing countries to attend. Workshop outcomes will be reported as publications and synthesis papers in a peer reviewed journals.
- OceanObs09 Conference, 21-25 September 2009, Venice, Italy.
- PICES Eighteenth Annual Meeting: *Understanding ecosystem dynamics and pursuing ecosystem approaches to management*, Jeju, Korea (23 Oct-1 Nov 2009)
- AIMES OSC *Earth System Science: Climate, Global Change and People* 10-13 May 2010, Edinburgh, Scotland.
- Summer School Institut Universitaire Européen de la Mer, France August 2009)
- ICED SSC Meeting
- SIBER SSC Meeting in Perth, Australia March 2010