



MINUTES

IMBER Scientific Steering Committee Meeting

Kirstenbosch Botanical Garden, Cape Town, South Africa
May 5-6, 2008

Present:

SSC members (and IPO)

Julie Hall
Javier Aristegui
Mary-Elena Carr
Jay Cullen
Coleen Moloney
Mike Roman
Jing Zhang
Arne Körtzinger
Hiroaki Saito
Jean-Pierre Gattuso
Sylvie Roy (IPO)

Invited participants

Emily Brévière (IGBP)
Ed Urban (SCOR)
Bob Anderson (GEOTRACES)
Keith Alverson (IOC/GOOS)
Nancy Rabalais (LOICZ)
SOLAS SSC members
GLOBEC SSC members

Apologies:

SSC members

Wajih Naqvi
Jack Middelburg
Wilco Hazeleger
Nicolas Gruber
Carol Robinson

1	INTRODUCTION	4
1.1	WELCOME FROM THE IMBER CHAIR (JULIE HALL).....	4
1.2	UPDATE ON THE INTERNATIONAL PROJECT OFFICE ACTIVITIES (REPORT BY SYLVIE ROY)	4
2	IMBER IPO ACTIVITIES	5
2.1	E-MAIL/MAILING LIST (REPORT BY SYLVIE ROY)	5
2.2	IPO COMMUNICATION (REPORT BY SYLVIE ROY).....	5
2.2.1	Brochure	5
2.2.2	Poster.....	5
2.2.3	IMBER update	5
2.2.4	IPO report	5
2.2.5	Website.....	5
2.2.6	e-News.....	6
2.2.7	Gorick image.....	6
3	IMBER WORKING GROUPS AND TASK TEAMS REPORTS.....	6
3.1	CONTINENTAL MARGINS TASK TEAM (REPORT BY NANCY RABALAIS).....	6
3.2	DATA MANAGEMENT WORKING GROUP (REPORT BY JAY CULLEN).....	6
3.3	THEME 4 (REPORT BY JULIE HALL).....	7
3.4	CAPACITY BUILDING WORKING GROUP (REPORT BY JING ZHANG)	8
3.5	END-TO-END TASK TEAM (REPORT BY COLEEN MOLONEY)	9
3.5.1	IMBER/GLOBEC End to End Food Web Task Team.....	9
3.5.2	Ongoing E2E activities within IMBER.....	9
3.5.3	Future E2E activities.....	10
3.5.4	Request for funding	10
3.6	SOLAS/IMBER CARBON RESEARCH WORKING GROUP (REPORT BY TRULS JOHANNESSEN)	10
3.6.1	WG1 Surface Ocean System (leader: Nicolas Metzl) (Report by Truls Johannessen)	10
3.6.2	WG2 Ocean Interior (leader: Nicolas Gruber) (Report by Arne Kortzinger).....	10
3.6.3	WG3 Carbon cycle climate sensitivities and feedbacks (leader: ??) (Report by Truls Johannessen)	12
3.7	IMBER IMBIZO 2008 (REPORT BY SYLVIE ROY)	12
4	UPDATE ON REGIONAL ACTIVITIES.....	13
4.1	ICED (REPORT BY EILEEN HOFFMAN).....	13
4.2	SIBER (REPORT BY JULIE HALL)	13
4.3	EUR-OCEANS (REPORT BY SYLVIE ROY).....	14
4.4	CARBOOCEAN (REPORT BY ARNE KORTZINGER).....	15
5	INTERACTIONS WITH OTHER PROJECTS AND PROGRAMS AND JOINT ACTIVITIES.....	16
5.1	IOC/GOOS (REPORT BY KEITH ALVERSON).....	16
5.2	OOPC (REPORT BY JULIE HALL).....	16
5.3	GODAE (REPORT BY JULIE HALL)	17
5.4	GEOTRACES (REPORT BY BOB ANDERSON)	17
5.5	PAGES (REPORT BY JULIE HALL).....	18
5.6	CLIVAR (REPORT BY SYLVIE ROY).....	18
5.7	PICES (REPORT BY HIROAKI SAITO).....	19
5.8	IGBP (REPORT BY EMILY BRÉVIÈRE)	20
5.8.1	New Executive Director appointed	20
5.8.2	Fundraising and added value	20
5.8.3	ICSU/IGFA review	20
5.8.4	IGBP-WCRP “merge” update	20
5.8.5	Ocean acidification	21
5.9	SCOR (REPORT BY ED URBAN).....	21

5.9.1	SCOR new working groups in 2007	21
5.9.2	GEOHAB	21
5.9.3	Second Symposium on the Ocean in a High-CO ₂ World	21
5.9.4	SCOR 50 th Anniversary Symposium: 20-21 October 2008	21
5.9.5	2009 Project Summit	21
5.10	GLOBEC	22
5.10.1	Regional projects update	22
5.10.2	BASIN	24
5.10.3	Transition Task Team	24
5.10.4	Other joint activities	25
6	UPDATE ON COUNTRY ACTIVITIES FOR IMBER PROJECT	26
6.1	CANADA (REPORT BY JAY CULLEN)	26
6.2	CHINA (REPORT BY JING ZHANG)	26
6.3	FRANCE (REPORT BY JEAN-PIERRE GATTUSO)	27
6.4	GERMANY (REPORT BY ARNE KORTZINGER)	28
6.5	INDIA (REPORT BY WAJIH NAQVI)	29
6.6	JAPAN (REPORT BY HIROAKI SAITO)	30
6.7	THE NETHERLANDS (REPORT BY JACK MIDDELBURG)	31
6.8	NEW ZEALAND (REPORT BY JULIE HALL)	31
6.9	SOUTH AFRICA (REPORT BY COLEEN MOLONEY)	31
6.10	SPAIN (REPORT BY JAVIER ARISTEGUI)	32
6.11	UNITED KINGDOM (REPORT BY CAROL ROBINSON)	33
6.12	UNITED STATES OF AMERICA (REPORT BY MIKE ROMAN AND MARY-ELENA CARR)	35
7	IMBER IMPLEMENTATION ACTIVITIES	35
7.1	IMBER FUTURE ACTIVITIES AND STRATEGY (DISCUSSION LED BY JULIE HALL)	35
7.1.1	Integration of biogeochemistry and ecosystems	35
7.1.2	IMBIZO-2 topics	35
7.1.3	Synthesis activities	36
7.2	IMBER PRODUCTS	36
7.3	ENDORSEMENT	36
7.4	FUNDING	37
7.5	SSC ROTATION & NEW MEMBER	38
7.6	NEXT EXECUTIVE MEETING	38
7.7	NEXT SSC MEETING	38

1 Introduction

1.1 Welcome from the IMBER chair (*Julie Hall*)

Julie Hall welcomed the SSC Members to the 2008 IMBER SSC Meeting. She also welcomed new SSC members present: Javier Aristegui (Universidad de Maspalomas) and Jean-Pierre Gattuso (Observatoire Océanographique, Villefranche-sur-Mer), and absent: Nicolas Gruber (Swiss Federal Institute of Technology, Switzerland) and Carol Robinson (University of East Anglia).

She gave an overview of the objectives of the meeting to:

- Review the IPO activities
- Review the Working Groups and Task Team activities
- Review the regional and national activities
- Develop a plan for the implementation of IMBER in the near future: look at the IMBER legacy, and develop an overall plan of what is needed to achieve it.
- Identify the priorities for next year and funding requirements
- Review the Budget

1.2 Update on the International Project Office activities (*Report by Sylvie Roy*)

Sylvie Roy gave an overview of the accomplishments of the IPO over the past year including renewal of the IPO funding, working group support, organization of meetings and activities, meetings attended on behalf of IMBER and products developed.

Since October 2007, Sylvie worked with the representatives of the organization supporting the IMBER IPO in Brest. With the dedicated support of Patrick Monfray at the CNRS, support for three additional years (2008-2011) has been secured for the three full time positions. Ifremer has also joined the consortium as a new contributor for the next phase of the IPO.

During a meeting with the French consortium, Sylvie proposed a two phase approach for the IMBER IPO for the next 3 years (2008-2011): from July 2008 until March 2010, as the GLOBEC IPO is scheduled to close in March 2010, and from April 2010 until July 2011. In response to this proposed way forward, the French consortium as agreed to try to find more funding for hiring two more persons to support the increase in workload of the IPO. The French consortium has agreed to hold a meeting in April 2009 to find out about the latest discussions and proposed way forward from the GLOBEC/IMBER Transition Task team.

The IMBER IPO organized many conferences and activities since June 2007. These include:

- **IMBER/GODAE task team** (Paris, June 12-13, 2007)
- **Joint IMBER/LOICZ Continental Margins Open Science Conference** (Shanghai, September 17-21, 2007)
- **Joint IMBER/GLOBEC Executive Committee meeting** (Brest, October 7-9, 2007)
- **First Stakeholders meeting for IPO funding renewal** (Brest, October 10, 2007)
- **Second Stakeholders meeting for IPO funding renewal** (Paris, April 14, 2008)
- **CLIMECO Workshop** (Brest, April 21-24, 2008)
- **2008 IMBER SSC meeting** (Cape Town, May 5-6, 2008)
- **« BEER » Data integration training** (Miami, November 9, 2008)
- **IMBER IMBIZO 2008** (Miami, November 10-13, 2008)

The IMBERIPO is now supporting the organization of:

- **Summer School in Turkey** (Ankara, August 11-16, 2008)

- **SIC! Group meeting** (Venue and date, tbd)
- « **BEER** » **Data integration training** (Miami, November 9, 2008)
- **2008 IMBER IMBIZO** (Miami, November 10-13, 2008)
- **Global-Scale Synthesis International conference** (Switzerland, dates tbd, 2009)
- **Transition Task Team Second Meeting** (Venue and dates tbd)
- **Workshop on sensors** (Venue and dates tbd)
- **Summer School in Brest** (IUEM, Brest, 2009)

Sylvie presented a list of potential sources for funds such as ESF (for conferences, workshops), APN (for Capacity Building activities, European Institute for Marine Studies and Brittany Region (for workshop organisation)).

2 IMBER IPO activities

2.1 e-mail/ mailing list *(Report by Sylvie Roy)*

A list of over 650 names is managed and used by Elena for IMBER announcements. The IPO has a National contact for 22 countries. This year Alberto Borges was appointed as Belgium contact and Adnan Al Azri for Oman.

Action: All to continue to identify national contacts.

2.2 IPO communication *(Report by Sylvie Roy)*

2.2.1 Brochure

Brochures copies are available from the IPO. We invite you to contact Elena Fily in advance if brochures are required for meetings.

2.2.2 Poster

Two new posters were developed for the IGBP congress. One of them is focussed on the role of the IMBER IPO, the second shows the major achievements of IMBER over the last year of activity. The posters are downloadable from the IMBER web site at http://www.imber.info/restricted_area.html (SSC restricted area).

2.2.3 IMBER update

The design of the newsletter has been revised to improve the “onscreen” readability. The design was simplified accordingly to the comments received from the IMBER SSC. We are now producing 3 issues of the IMBER update per year.

2.2.4 IPO report

In order to improve interactions between the IMBER IPO and the SSC members, the IPO is producing a monthly IPO Report. The aim is to keep SSC up-to-date with the IMBER and IPO activities and allow a better synergy between the IPO and the SSC.

2.2.5 Website

This year, Sophie developed further the National contact page http://www.imber.info/national_activities.html . She also developed a portal for highlighting the activities of the Joint Carbon Research Group and started to work on Outreach Portal to support the Capacity Building group.

The IMBER web site was visited 15600 times over a period of 12 months. The number of visit has double since last year. A curve of the number of visit per day over the two last years showed peaks of hits generally following announcements for IMBER activities.

Action: Sophie to develop the Data Portal.

Action: Sophie to update the web site on a regular basis.

2.2.6 e-News

Sophie has been publishing a monthly IMBER e-News since April 2007.

2.2.7 Gorick image

Sylvie presented the final Gorick's image. The image is available in high resolution format on request at the IPO.

3 IMBER Working Groups and Task Teams reports

3.1 Continental Margins Task Team (Report by Nancy Rabalais)

IMBER and LOICZ co-sponsored The Continental Margins Conference that was held at the Zhong Shan North Road Campus of the East China Normal University (Shanghai, China) on September 17-21, 2007. This meeting was co-convened by Jack Middelburg (IMBER) and Nancy Rabalais (LOICZ) who are leading the development of an implementation plan for continental margins research. The overall goal of this conference were to provide a discussion platform for highlighting the most recent advances in coastal biogeochemical cycles and ecosystems research and try to identify emerging directions and future research challenges. A total of 110 scientists from 25 different countries attended this conference. Invited speakers delivered keynote talks at the beginning of the sessions. This was followed by high standard oral and poster presentations. Dynamic discussion session wrapped up each session. The discussions lead to a list of primary research themes that should be incorporated in a plan for collaborative research efforts on coastal biogeochemistry and ecosystems, its responses to global changes and its feedback effects on the Earth System and human society. A sub-group of the organizing committee has published a meeting report in EOS.

Since September 2007, Jack Middelburg and Nancy Rabalais met in Orlando to develop an outline of an implementation plan. A list of IMBER and LOICZ themes have been identified that include: sources and sinks of CO₂, coupled model of ecosystems and biogeochemistry for continental margins, coupling of elements cycles, regeneration, model of coupling ocean and bottom, and ocean shelf exchange. Writing is in progress. Nancy stated that the plan is to have a draft by mid-summer. No meeting is needed. It is expected that the development can be done by email. It is suggested to get input for the implementation plan from the workshop on terrestrial carbon that will be held in Miami.

Julie mentioned that she is working with Jing to explore the possibility of funding an office in China for support to the Continental Margins IMBER/LOICZ activities.

Action: Nancy and Jack to draft a message to all participants to update them on the progress to keep them engaged.

Action: Sylvie to send out the update message from Jack and Nancy to the CM OSC participants.

3.2 Data Management Working Group (Report by Jay Cullen)

Jay reported on the first Data Management Committee Meeting held prior to the last SSC meeting in Victoria (10-11 June 2007). The challenge for DMC is to design a data management strategy for IMBER that spans the wide range of multi-disciplinary data that will be collected. One of the data legacy identified by the committee is to develop a way to keep together mixed data sets that stand on their own.

There is a clear implication of time and resources that are needed to create this. One suggested way to reach this goal is to educate young and senior scientists. The initiatives suggested by the DMC include:

- Use IMBER Imbizos as training opportunities.
- DMC to develop a guide to good data practice - a “cookbook” for researchers.
- DMC to develop or commission technical tools to aid Data Scientists (e.g. converters to create Cruise Summary Reports from various local cruise report formats; Data Liaison Officer to develop IMBER data web pages and create a data portal to, probably, the Global Change Master Directory).

The DMC is organising an interactive workshop entitled “BEER” The secret to a successful project”. This workshop, to take place on Sunday 9 Nov. 2008 in Miami, will immediately precede the main IMBIZO workshops, and will be co-convened by Raymond Pollard and Todd O’Brien.

The objective of the workshop is to present the benefits of adding a Data Integration Scientist to any project, to introduce the various data integration and handling techniques illustrated in the IMBER Data Integration Cookbook and to seek feedback on the draft of the Cookbook.

Scientists of all experience levels are invited to participate in this workshop and contribute to the discussion. Proposed lecturers are Raymond Pollard, Todd O’Brien (NOAA) and possibly Gwen Moncoiffe (BODC). For further information about the workshop see

<https://www.confmanager.com/main.cfm?cid=1185&nid=9105>

Funding is requested to cover the participation of Todd O’Brien (~USD \$1800).

Discussion:

- It is important to link the metadata instead of determining a list of standard measurements. The cookbook will include guidelines on how to build metadata.
- It is also important to educate scientists to value the data management function and get some training for these function in the plans for career developments.
- There is an initiative led by SCOR and the IOC International Ocean Data and Information Exchange (IODE) to encourage new means to make data used in traditional journal publications more accessible and to promote expansion of the idea of stand-alone data publications.
- The funding agencies have to be made aware of the importance of supporting financially data management activities.
- An initiative is underway that proposes that papers should not be published if the associated data are not archived. This is already in place in the field of molecular biology and could be applied to marine sciences.
- The preparation of the IMBER data policies is underway and the text will be included in the cookbook.
- It is reiterated that data management activities should be embedded in all IMBER activities including capacity building activities.
- BCO-DMO office in Woods Hole. They will archive all marine biological data for the US (allGLOBEC and OCB). Dave Glover, Cindy Chandler, Peter Wiebe are part of BCO-DMO (<http://www.Bco-dmo.org>)

Action: Contact Temel Oguz to encourage him to include data management topics in the Ankara Summer School.

3.3 Theme 4 (Report by Julie Hall)

Developing the theme 4 is difficult because of the complexity to bring social and natural sciences together. Last year’s decision was to wait until after the Continental Margins OSC (Shanghai 2007) and the GLOBEC meeting on Coping with global change in marine social-ecological systems (Rome, July 2008) and to move the development of this theme later.

The Session 8 “Sustainable Use of Continental Shelf Resources” in Shanghai did not get a strong response. Julie will be attending the meeting in Rome next July.

Discussion:

- Carol Robinson from University of East Anglia is organizing a Town Hall for IMBER and one session will be oriented on Theme 4.
- It is suggested to invite an anthropologist to the IMBIZO. Mary-Elena mentioned Kenny Broad, an anthropologist from Miami (<http://www.rsmas.miami.edu/divs/maf/People/Faculty/Broad/>; kbroad@rsmas.miami.edu). He can also suggest people if he's not available for the IMBIZO. He works with economists and sociologists on climate and ocean matters.
-
- It is suggested to ask the Transition Task Team to propose ways forward for the IMBER Theme 4.
- Could the iron addition be a good prospect for theme 4?
- We need to define a small concrete theme or focus on few case studies to develop the working group; Examples are: GLOBEC focus 4 on fisheries to continue under IMBER after the transition and carbon sequestration that could be linked to the SIC! Group (including policies and legal aspects).

Action: Mary-Elena to approach Kenny Broad, an anthropologist to attend the IMBER IMBIZO.

Action: Mike to report to the Transition Task team about theme 4 and ask them to suggest ways forward for IMBER.

3.4 Capacity Building Working Group (*Report by Jing Zhang*)

Capacity building is an important activity of various other ongoing projects, including those supported by SCOR and IGBP, hence coordination of our activities with these efforts is essential for optimal resource utilization. SCOR has formed a Committee on Capacity Building where IMBER is represented by Wajih Naqvi (please visit <http://www.scor-int.org/capacity.htm> for details).

IMBER is organizing through collaboration with EUR-OCEANS a Summer School in Ankara, Turkey, on 11 -16 August, 2008. Prof. Temel Oguz, a member of the Capacity building working group is the organizer of this Summer School. The IMBER IPO supported the organizers and prepared a website (http://www.imber.info/E2E_EcoModel_programme.html).

Participants will be Ph.D students and young Post-docs working with biogeochemical cycles and end to end food webs. Confirmed lecturers are Icarus Allen (PML/UK), Temel Oguz (METU/Turkey), Mike St.John (HU/Germany), Jing Zhang (ECNU/China). The programme consists of lectures, discussions, practical work/experiments and poster sessions.

Discussion:

- It is suggested to use the live broadcast technology used for CLIMECO during the summer school to broadcast the lectures live.
- The SCOR capacity building committee submitted two proposals to APN and others to organize a meeting early next year. The committee is working by email to develop ideas. One of those is to raise funds to support exchange of professor (ie send a professor to a country for a short time).
- It is suggested to develop actions on capacity building and data management jointly.
- Wajih asked to be replaced as the Chair of the Capacity Building WG. Julie asked Jing if he would take this position. Jing agreed.

Action: IPO to contact Temel to suggest he tries to use the broadcast live to broadcast the summer school lectures.

Action: Sylvie to find out what is needed to do the broadcast in terms of network and tools.

3.5 End-to-End Task Team (*Report by Coleen Moloney*)

3.5.1 IMBER/GLOBEC End to End Food Web Task Team

Final report was submitted to the IMBER and GLOBEC executives in October 2007 in the form of drafts of two manuscripts. (Moloney et al., in prep. and St John et al., in prep.).

Both manuscripts are still in draft stage.

3.5.2 Ongoing E2E activities within IMBER

Summer School. Temel Oguz is organising a Summer School on "Analyses of the interactions between end to end marine food webs and biogeochemical cycles", to be held from 11-16 August 2008 in Ankara, Turkey.

IGBP Congress Working Group Session. Coleen Moloney, Mike St John and Astrid Jarre organized a working session on *End to end food webs in marine ecosystems* at the IGBP Congress in Cape Town on May 8, 2008. The format of the session consisted of three 20-minute presentations, followed by an hour of structured discussion. The presentations were:

- Bridging gaps by weaving marine food webs from end to end (Coleen L. Moloney, South Africa)
- Looking at the end-to-end food web through copepod *Neocalanus* (Hiroaki Saito, Japan)
- Benguela food webs in relation to global change (Lynne J. Shannon, South Africa)

IMBER Imbizo. Coleen Moloney and Mike Roman are co-chairing one of the three IMBER Imbizo workshops on *Ecological and Biogeochemical Interactions in End to End Food Webs*. (<https://www.confmanager.com/main.cfm?cid=1185&nid=8821>)

A plenary speaker (Patrick Lehodey, France) accepted to introduce the workshop topic to the Imbizo.

The workshop will be considering two perspectives:

- material cycles related to high trophic level species - what are the relative impacts of change on material cycles through predator-prey interactions (looking from the top down)?
- transformations of elements linked to low trophic level species - what indices should be used to describe material transfer from photosynthesis to fisheries (looking from the bottom up)?

Workshop product: special issue

- from presentations given at the workshop
- manuscripts resulting from discussion sessions

IMBER/LOICZ Open Science Conference (September 17-21, 2007).

Julie Hall presented a paper at the OSC:

Hall, J., Moloney, C.L., St John, M.J. End to end food webs from high to low latitudes: current understanding and future challenges

CLIOTOP symposium (December 2007)

Coleen Moloney attended the symposium and a short meeting of the CLIOTOP SSC. She gave a short presentation at the SSC meeting to update the members about current and future IMBER activities, and also gave a presentation at the symposium Moloney, C.L., St John, M.J. and others. Top predators in end to end food webs: *current gaps and future challenges*

3.5.3 Future E2E activities

We need study looking at specific (regional) food web and also with a global vision. The IMBER Imbizo is the time and place to take stock. The end to end food web activities involve synthesis and require workshops and face-to-face discussions.

3.5.4 Request for funding

Partial support in 2009 for meeting(s) that will allow small groups of people to tackle and make progress on specific e2e topics, some of which should be identified at the IMBER Imbizo.

Budget: US\$5000

3.6 SOLAS/IMBER Carbon Research Working Group *(Report by Truls Johannessen)*

3.6.1 WG1 Surface Ocean System (leader: Nicolas Metzl) *(Report by Truls Johannessen)*

The activities of the SIC-SOS group, mainly in collaboration with IOCCP, CDIAC, CARBOOCEAN, were focussed on decisions taken at the SOCOVV meeting last year in Paris:

1) Write reports of this meeting in several journals (EOS, SOLAS, IMBER).

2) Follow the publication of the special issue (DSR). The issue contains 13 papers accepted with revisions. The issue includes most of the topics addressed during the meeting (new CO₂ climatology, CO₂ variability and decadal changes, coastal regions, instruments, modelling, ecosystems variability and vulnerability...). The member of the SIC-SOS group were and are still very active on this as lead author (Borges, Beaugrand, Metzl), co-authors (Bakker, Bates, Metzl) or co-editor (Bakker, Metzl). We hope the issue will be published this year (2008).

3) Data synthesis activities and regional groups: the SOCAT project (Surface Ocean CO₂ Atlas) is born. This is done in close collaboration with IOCCP, CARBOOCEAN, CDIAC and obviously with all contributors of surface p CO₂ data. A meeting was organized last December in Bremen (jointly with CARBOOCEAN) to evaluate the actuality of the global and regional synthesis, discuss on the quality control. A report of this meeting is available on IOCCP web page.

4) Second SOCAT meeting will be organized in Paris in June (16-17). It will be sponsored by IOCCP, SOLAS, and IMBER. About 20 participants are invited. The goals of the meeting are: to reach international agreement on 2nd Level QC procedures, to identify approaches for gridding and interpolation, to identify major science issues for each basin and globally, and to develop a short report for distribution to all relevant networks.

5) Budget: in addition to the SOCAT-2 meeting in Paris next June, the SIC-SOS ask for support to provide a copy of the DSR II special issue to all participants of the SOCOVV meeting. For about 100 participants the total would be around 6000 US\$. Sylvie Roy (IMBER and Guest editor of the DSR issue) will approach SOLAS/GCP/IOCCP to help with IMBER for this financial support.

3.6.2 WG2 Ocean Interior (leader: Nicolas Gruber) *(Report by Arne Kortzinger)*

The Oxygen-Argo Program (ARGO-O₂)

- White Paper finalized in Feb. 2007
- Presented to ARGO Steering Team in March 2007
- Response letter from ARGO (Howard Freeling) with “Go-Ahead“ in Nov. 2007.

Towards Global Observatories for Oxygen Depletion (OXYWATCH O₂)

- FP7 Cooperation Specific Programme for 2008: Call ENV.2008.4.1.2.1 Monitoring and observing oxygen depletion throughout the different Earth system components
- Project for 2009-2012; 3.5 million euros
- 15 partner organizations;
- Work packages themes:
 - 1: Coordination and Management
 - 2: Oxygen Sensor Technology Development
 - 3: Oxygen Float Pilot Study
 - 4: Coastal Oxygen Glider Study
 - 5: Atmospheric Oxygen Study
 - 6: Synthesis, Modelling and Prediction
 - 7: Outreach, Dissemination and Communication

CARbon dioxide In the North Atlantic (CARINA)

CARINA was initialized at a meeting in Delmenhorst in June 1999. The objective is to collect carbon relevant data sets in the North Atlantic and form a consistent, quality-controlled data base for the Atlantic (including the Southern Ocean and the Arctic). The CARINA data base was incorporated into CarboOcean. A meeting was held in Iceland 2006 with support from IOCCP and CarboOcean. Regional working groups were formed during the Iceland meeting:

- 1 North Atlantic (Toste Tanhua).
- 2 Arctic Mediterranean Seas (Are Olsen).
- 3 Southern Ocean (Mario Hoppema).

CARINA is now a true international project with participants from several continents including U.S. scientists with experience from similar Projects (GLODAP). The data coverage includes: The Nordic Seas, The northern North Atlantic, North and Central Atlantic, Southern Ocean

Next steps:

- Finalizing the Crossover analysis in early 2008
- Final assessment of adjustments (or, the lack of) by May 2008. All lines of evidence uploaded on the website.
- Final, „wrap-up“ meeting in Paris Meeting (June 18-19). Consensus on adjustments (or lack of).
- Product online shortly after that (late June?)

Decadal Variations of the Ocean’s Interior Carbon Cycle: Synthesis and Vulnerabilities

Global Carbon Synthesis Symposium

Centro Stefano Franscini at Monte Verità

Ascona, Switzerland

July 13-17, 2009

Proponents:

Nicolas Gruber, Arne Körtzinger, Richard Feely

Available funds: 26.000 CHF (25 000 USD)

(mainly for meeting facilities, invited speakers/students)

3.6.3 WG3 Carbon cycle climate sensitivities and feedbacks (leader: ??) (Report by Truls Johannessen)

Sub Group 3 is focused on understanding the climate feedbacks to the ocean. They were charged to identify scientific issues and develop a strategy to move forward. Amongst others, this sub group should play a role in coordination and synthesis of acidification type activity. This has not been formed yet. One proposed theme for the group is to focus on the High CO₂ concentration and change of pH and their effects on biogeochemical cycles and ecosystems.

Discussion:

- Contradictory results show a need for further method standardization and global coordination.
- The steering committee of the Ocean in High CO₂ World Symposium could be approached to help with the creation of this group.
- This meeting will certainly offer a good opportunity for this group to discuss.
- It is proposed to organize a Town Hall at the High CO₂ symposium to develop the terms of reference for the group.
- It is proposed to organise a training workshop on perturbation experiments in collaboration with EPOCA to address the mesocosms issues.

SIC! General coordination

- A proposal is almost ready to submit to the Norway funding agencies for funding of a SIC! Secretariat.
- The Implementation plan for carbon research will be revised and printed.

Action: Sylvie to approach GCP, SOLAS and IOCCP for financial support to buy copies of the DSR II volume.

Action: Jean-Pierre to approach Kitack to help with the formation of the Sub-Group 3 of SIC!

3.7 IMBER IMBIZO 2008 (Report by Sylvie Roy)

Sylvie presented an update of the logistics of the conference. A contract was signed with the May Fair hotel (<http://www.mayfairhotelandspa.com>). Sylvie described the floor plan and the different possibilities in terms of conference rooms available and poster/lunches area. A block booking for guest rooms was agreed on. The group price is 179.00 + tax (USD). For audio-visual, we will pay for sound support for the plenary sessions and tripod screen, power strip and cart for the breakout sessions but provide our own projectors. Breakfast is not provided by the conference but available at the hotel, buffet lunches are provided, there will be coffee breaks and refreshments and snacks for the poster sessions. Finally, we have organized a IMBIZO dinner at the Rusty Pelican Restaurant.

The IMBIZO website was launched in February (<http://www.imber.info/IMBIZO.html>; <http://www.confmanager.com/main.cfm?cid=1185>).

Sylvie presented the conference budget: we have secured funds from SCOR (7500 USD for developing country scientists travel and 10000 USD from NSF), University of Brest (1100 USD), EUR-OCEANS (5800 USD towards End-to-end workshop), OCB (25000 USD towards mesopelagic workshop) and University of Miami (4940 USD). However, there is still a need for more funding to support the member of the workshop sub-committees that would like to attend but have no funds. At this point, the budget will support the scientific organizing committee and the three plenary speakers.

Update from the End-to-end workshop:

- Plans for a special issue from participants and a synthesis paper;
- Will have a structure for the workshop by the end of May;
- Patrick Lehodey accepted to be the invited speaker;
- Abstracts could go to the web to initiate the synthesis paper;
- No social scientist have been approached;

Update from the Mesopelagic workshop:

- Richard Lampitt will be the plenary speaker;
- Key issues were identified: There will be 6 or 7 key issues;
- There is an ongoing discussion with the bathypelagic;
- Plans for a special issue in DSR II;

Discussion:

- Michael gave an update on the CLIMOS funding and announced a negative response from NASA and no response from ONR.
- How should we deal with the offer from CLIMOS? There is contradiction in the scientific community. The opinions around the table go from: cautious: accepting funding could be seen as IMBER taking a position in the debate and we should be careful not to damage the reputation in the public's eyes; neutral: our role is to transfer the knowledge to the public but not decide what can be done; the public has an opinion too; creative: integrate the private companies to the scientific community.
- We need to have a clear agreement upfront as this is a politically hot issue. We do not want to change our plans for workshop if they sponsored.
- Some areas have dealt with this issue and found a way to accept support without advocacy. We should figure out how to work with industry and private sector partnerships.
- One way forward could be to organize a workshop, jointly with SOLAS and GEOTRACES, on what was learned from iron fertilization experiments and invite private sector speakers.
- The decision is not to consider the offer from CLIMOS if there are strings attached.
- Discussion about how to synthesize all workshops will have to happen soon. The detailed programmes of the workshops could be used to identify overlaps.

Action: IPO to update the information on the IMBIZO website for the three workshops and BEER including their programs by the end of May and circulate one last announcement.

Action: Sylvie to circulate EGU and AGU policy regarding private sector funding to the SSC.

Action: Michael and Julie to talk to Margaret about CLIMOS's offer.

4 Update on Regional activities

4.1 ICED (*Report by Eileen Hoffman*)

(see section on joint meeting with GLOBEC)

4.2 SIBER (*Report by Julie Hall*)

SIBER emerged as a result of the potential opportunity to leverage the planned CLIVAR/GOOS Indian Ocean mooring array (IndOOS) and associated cruises, etc. The idea is to develop a new, parallel program in the IO focused on biogeochemical and ecological research, with the

mooring array (and other existing infrastructure) providing a physical observational foundation. It is also an opportunity to promote interdisciplinary, international collaboration and research in the Indian Ocean. A SIBER Conference was held in October 3-6, 2007 in Goa. More than 200 registered participants from many nations, 44 invited speakers, and over 50 poster presentation. The aim of the conference was to review the state of our knowledge of the biogeochemical and ecological dynamics of the IO and identified prominent gaps.

As a follow-up to the 2006 SIBER (Sustained Indian Ocean Biogeochemical and Ecosystem Research) conference, Raleigh Hood and Wajih Naqvi convened a SIBER science-plan writing workshop on November 27-30, 2007 in Goa, India. This meeting brought together an international group of participants (30 Scientists from 12 countries) who were tasked with identifying the primary research themes for SIBER and developing the draft text for the SIBER science plan. This document, which is still under development, distills and articulates the scientific background and key questions that need to be addressed in the Indian Ocean. It also includes a research implementation plan for each primary research theme. The goal is to provide a comprehensive plan for Indian Ocean research that encompasses the entire basin, but that can also be divided into tractable scientific themes or regional studies, and that is consistent with the primary research themes of IMBER.

Six major themes were identified:

- Boundary current dynamics, interactions and impacts on biogeochemistry and ecology
- Equatorial circulation and Indonesian through flow impacts on biogeochemistry and ecology
- Controls and fate of primary production in the Indian Ocean including marginal seas
- Biogeochemical differences between the AS and BoB
- Global change and anthropogenic impacts - current and future, and feedback on humans, considering the different scales of manifestation of the two
- Role of higher trophic levels in ecological processes and biogeochemical cycles

The objective of the writing team is to submit the plan for review at the IMBER Executive meeting in November 2008.

Discussion:

- It was suggested to make sure that there is a plan for data management embedded in ICED and SIBER's science plans.
- There is not link with SOLAS at this point.
- The potential funding to support studies in the Indian Ocean and the Bay of Bengal could be through Indian and US funding agencies. There is also an interest from Australia to contribute.

Action: Report back to the SIBER writing team and make them aware that any research studies will have to be submitted to a database.

Action: IPO to get a list of SIBER 2006 Conference participants to add to the IMBER email list

4.3 EUR-OCEANS (*Report by Sylvie Roy*)

Over the past year, EUR-OCEANS and IMBER joint activities focused on marine biogeochemical and ecosystem research including:

- End-to-End food webs task team activities;
- International Symposium on "Parameterization of trophic Interactions in Ecosystem Modelling", (March 2007);
- CLIOTOP Symposium December 2007;

- ICED, joint international multidisciplinary initiative launched in response to the increasing
- need to develop integrated circumpolar analyses of Southern Ocean climate and ecosystem dynamics;
- Climate driving of marine ecosystem changes...Training for young marine scientist (CLIMECO), April 21-24, 2008.

Two joint EUR-OCEANS/IMBER activities are planned in the coming months:

- Summer School on Analyses of end to end marine food webs and biogeochemical cycles at the Middle East Technical University, Ankara (Turkey) on August 11 -16, 2008;
- End to end food web workshop at the IMBER IMBIZO in Miami (USA) on November 9-13, 2008.

In the recent and coming months a number of EUR-OCEANS activities of interest to IMBER have occurred or are planned:

- Ecosystems End to End: Links and levels in marine ecosystems 21 – 22 April 2008 Siena, Italy;
- Modelling ecosystems dynamics based on plankton functional types 22-24 October 2008, Villefranche sur mer France;
- Climate-biogeochemistry interactions involving Oxygen (O₂) in the tropical oceans fall 2008 Kiel Germany.

EUR-OCEANS through it's endorsement program allows EUR-OCEANS scientist to use their institutional EUR-OCEANS money to attend relevant non-EUR-OCEANS meetings and workshops. The Workshop on ecological and biogeochemical interactions in the mesopelagic zone Nov 9-13, 2008 Miami FL USA was endorsed by EUR-OCEANS

Finally, The EUR-OCEANS Network of Excellence is due to end Dec 31, 2008. The final meeting is scheduled for Nov 25 – 27, 2008 in Rome, Italy. The EUR-OCEANS Network will then likely become the EUR-OCEANS (European Research on Ocean Ecosystems under Anthropogenic and Natural *Forcings*) *multi-site Consortium*. The exact final status and definition (legal documents) of this is being defined now for submission to Member Organizations.

Action: IMBER IPO to link with the multi-site institute after the end of EUR-OCEANS.

4.4 CARBOOCEAN (*Report by Arne Kortzinger*)

CARBOOCEAN is a EU FP6 Integrated Project on Marine carbon sources and sink assessment. The project started in Jan. 2005 and will be ending in Dec. 2009. The 3rd Annual Report of the project was reviewed very positively. All 5 core themes of CARBOOCEAN are contributing to IMBER relevant goals.

The North Atlantic surface ocean carbon observing system is in place and delivering seasonal as well as annual regional air-sea CO₂ fluxes with unprecedented accuracy for the past years. It became also evident that the northern North Atlantic sink for anthropogenic CO₂ is highly variable, i.e., measurements from one time cannot be straightforwardly extrapolated to analogous months in another year.

Also the Southern Ocean sink is highly variable and may as well have weakened during the past years. In situ measurements with buoys and remote sensing data confirm the high variability, among other factors, due to occasional high biological activity with local surface ocean pCO₂ drawdown.

Some major CARBO-OCEAN products are the Contribution to LDEO $p\text{CO}_2$ database that leads to new climatology and the Surface Ocean CO_2 Atlas (SOCAT) led by D. Bakker. CARINA (Carbon in the North Atlantic) has expanded to cover also the Southern Ocean (circumpolar) and the Arctic Mediterranean Seas. There is close to new 200 cruises in the data base and the 2nd level QC in its final phase. Data product consists of Quality controlled (1 and 2nd level) merged data with interpolated/ calculated values.

5 Interactions with other projects and programs and joint activities

5.1 IOC/GOOS (Report by Keith Alverson)

IOC is a co-sponsor to GLOBEC (10K/year). The IOC contribution represents a small investment for a lot of visibility in the GLOBEC and IOC community. This experience has been very positive and IOC is questioning if they would continue to be involved through IMBER or maybe engage the global research community in the future. IOC offers an access to scientific policy. It also offers the possibility to host meeting at the UNESCO building in Paris. IOC is participating to the IGBP, ESSP reviews hence it is already highly engaged with the scientific community.

Keith proposed possible for sponsorship strategies:

1. sponsorship stops with the end of GLOBEC;
2. IOC sponsors IGBP directly: but feels that it is not close enough to real realms;
3. The sponsorship is transferred from GLOBEC to IMBER: IOC maintains the same engagement;
4. IOC uses the funds to respond to demands at ground level: to sponsor activities directly.

Discussion:

- There is already a link to IOC through IOCCP and the SIC group. This link could serve as a link to IOC.
- There is a capacity building type effort to coordinate in the UN. The IOC network could be used to bring in people from different countries.
- Data management is an other clear link with IOC.

5.2 OOPC (Report by Julie Hall)

At our last SSC meeting, there was a request from OOPC to identify a non-carbon geochemist observationalist to sit on the OOPC meeting. This is still pending. We need suggestions to identify someone for this. It is suggested to find someone in the nitrogen fixation community.

Three names are put forward:

- Nitrogen: Debbie Bronk (VIMS), Tammi Richardson (U South Carolina); coastal and N: Jay Pinckney (U South Carolina); N and N fixation also has a series of people who might be good. Can provide names if you like.
- Silicon: Mark Brzezinski (UCSB), Paul Treguer (Brest), Diana Varela (U Victoria), and others if you need more.
- Oxygen: Steve Emerson and Paul Quay are great
- Jim Bishop is great, but he is definitely CARBON. He's great for float type devices but focuses mostly on carbon.

Action: Arne to talk to Niki and approached OOPC to find out what they need in terms of expertise for the non-carbon representative for the meeting. (Contacts: Ed Harrison and Albert Fisher)

Action: Sylvie to send a call to all SSC for suggestions for a non-carbon representative to OOPC meetings.

5.3 GODAE (Report by Julie Hall)

The GODAE-IMBER Task Team met in Paris on June 12-13, 2007. Three main axes of interactions were identified:

1. Improving GODAE products for applications in IMBER research;
2. Ocean Observing Systems: development needs from a GODAE-IMBER perspective;
3. IMBER STATE ESTIMATION: Offline coupling of Ecosystem-Biogeochemistry;

Draft reports for each topic have been written and are available from the committee.

GODAE is preparing their final conference: November 12-15 2008 in Nice (<http://www.ostst-godae-2008.com>) and IMBER's presence desired.

Outlook and Discussion:

GODAE is nearing the end of its lifetime while IMBER is just about to gear up to address issues of IMBER-GODAE interactions. It is hence critical for IMBER to provide leadership/input for the planning of data-model integration activities beyond the lifetime of GODAE

1. Input to GODAE white paper
2. IMBER leadership activities? The emerging O₂-Argo / BGC-Argo projects could provide a starting ground.

Action: Sylvie to check if Niki can attend the GODAE meeting in Nice in November, what he needs for financial support.

Action: Elena to check with Kirsten what is the exact venue for the final GODAE meeting and how to proceed to book for Niki to attend.

5.4 GEOTRACES (Report by Bob Anderson)

Bob introduced the objectives and motivation of the GEOTRACES project. He presented the interdisciplinary benefits and key elements of the projects. The science plan was published and is available online.

A planning meeting for the first US GEOTRACES Intercalibration cruise was held in early December 2007. Approximately 50 individuals from 7 countries (Canada, Japan, Kenya, Mexico, Spain, UK, USA) were in attendance. The stated goals of this cruise will be to:

1. Perfect a working (representative sample, no contamination) sampling system for as many trace elements and isotopes (TEI's) as possible that will be available for future USA and International GEOTRACES cruises, and,
2. Conduct an intercalibration for dissolved and particulate TEIs for the US and International GEOTRACES communities.

The workshop focused on creating a detailed cruise plan, including evaluation of various sampling systems and the settling on an approach to collect intercalibration water and particle samples. The cruise will be held June 6 to July 10, 2008 and will be separated into two legs with the first focusing on the collection of seawater reference material and the second on particles. The R/V Knorr will depart Norfolk, Virginia USA and transect to the BATS station southeast of Bermuda where the bulk of sampling will occur. Scientific crew change for the second leg will be in Bermuda on June 23 and particle sampling will begin at BATS will sampling underway on the return to Norfolk on July 10.

Leg 1 activities include testing and intercomparing carousel sampling systems, surface water sampling with an underway fish/sipper, dissolved TEI intercalibration at BATS, BATS vertical profiles for dissolved and particulate, and some particle work largely with Teflon coated sampling bottles. Leg 2 will focus on the collection of particles with *in situ* pumps versus sampling bottles (General Oceanics GO-Flo's), various *in situ* pump comparisons, particle intercalibration,

radionuclide and radiogenic TEI intercalibration with particle samples being collected at BATS and shelf/shelf break stations.

This intercalibration exercise is viewed as an important undertaking and aims to provide reference materials that can be distributed to the international community and reference profiles of TEI's to ensure compatibility and consistency of GEOTRACES data.

IMBER should require endorsed projects to follow protocols set by GEOTRACES when projects will generate TEI data. This involves using GEOTRACES protocols for cleaning of sampling materials, sample collection, handling and analysis.

An example of capacity building activity could be to educate on trace metal clean sampling technology and methods.

Action: IPO to circulate in the e-NEWS the call for intercalibration for GEOTRACES

5.5 PAGES (*Report by Julie Hall*)

There are two SCOR working groups on paleo-proxies (one completed and one ongoing) and also a component in EPOCA.

Action: Julie to talk to Julie (chair of PAGES) to discuss how to collaborate

5.6 CLIVAR (*Report by Sylvie Roy*)

The 15th meeting of the CLIVAR Scientific Steering Group (SSG) was held at the Headquarters of the World Meteorological Organization (WMO), Geneva, Switzerland, from 11-14 September 2007. The meeting heard presentations from the three other World Climate Research Programme projects and a number of other programmes and activities, including IMBER. The IMBER presentation was made by Wilco Hazeleger, a member of the IMBER SSC and co-chair of CLIVAR's Atlantic Panel. His presentation briefed the SSG on the goal and themes of IMBER, current IMBER-related projects and planned meetings and workshops, including the upcoming IMBER-led "Spring School" on Climate Driving of Marine Ecosystems which CLIVAR is co-sponsoring. In discussion, the SSG agreed the need to strengthen the existing links across to IMBER, in particular through seeking explicit representation of IMBER on all of four of CLIVAR's ocean basin panels (Atlantic, Pacific, Indian and Southern Ocean).

IMBER, CLIVAR, GLOBEC and EUR-OCEANS organized jointly on April 21-24, 2008 a training for young scientists entitled "Climate driven ecosystems changes". The motivation came from the need for making the connection between climate and ocean scientists to better understand the Sensitivity of Ocean to Climate change. The goal was to bring together young marine scientists on biogeochemistry and ecosystems research (grad students, postdocs) with climate scientists and to inform on climate driving of ocean processes that are relevant for impact on the marine environment. The organising committee was composed of: Wilco Hazeleger, Martin Visbeck, Geir Ottersen, Richard Sanders, Sylvie Roy, Olivier Aumont, Ivo Grigorov. The event was held at the Institute for Marine Studies, University of Brest. We received 190 applications from young marine scientists and the selection of the 30 candidates was a challenge. The numerous applications have allowed us to choose a group of high level science PhD and Post docs and lead us to expect a productive training.

The CLIMECO training workshop was a combination of scientific plenary sessions on defined themes followed by discussions and "hands-on" sessions where young scientists with a marine biogeochemistry/ecosystems background learned how to use climate data. This includes

sourcing relevant data, scrutinising its quality and knowing how to make use of it. Eight invited lecturers presented plenary sessions on the following topics:

- Ocean physics, patterns of climate variability and biogeochemical cycles
- The contribution of the ocean observing system to investigate ocean variability
- Modelling ocean circulation and variability
- Combining ocean observations and circulation models
- Patterns of climate variability and change forcing the ocean
- From Physics to Fish and bioclimate feed backs
- Physical ocean processes upwelling, mixing, surface forcing, nutrients and fish
- Future changes in the atmosphere - ocean system
- Marine ecosystems lecture

The products used for the hands-on sessions were data archives such as PCMDI IPCC coupled model archive, flux data sets, ocean reanalysis data sets, (e.g. ECCO, SODA and hydrography) and tools such as Climate Explorer for statistical analysis, hydrobase, and Ocean Data View.

Due to the interest shown in the CLIMECO Training for Young Scientist, we made a valiant effort to broadcast live on internet the plenary lectures throughout the week using the EUROCEANS Web Conference tool. The platform allows for a very brief discussion after each plenary. Although priority was given to question from attending participants, it was also possible for web participants to ask questions.

All candidates were asked to prepare a poster presenting their research. A poster session was held on the first day during the icebreaker where local students and scientists were also invited. The posters stayed up for the whole duration of the workshop to allow exchange between workshop participants and the local students and scientists.

Outcomes from the training will include a meeting report, articles in IMBER, CLIVAR and GLOBEC newsletters, and public outreach film (collaboration with Oceanopolis). All powerpoint lectures are available from the IMBER website.

Funding to support this activity came from many sources: EUR-OCEANS, CLIVAR, GLOBEC, IMBER, University of Brest, and Region of Brittany.

It was suggested to repeat this activity in 2010.

Action: Contact CLIVAR (Howard or Wilco) to identify a representative for the Indian Ocean Panel. Suggestions: Raleigh Hood or ? McKinley from the OCB community

5.7 PICES (*Report by Hiroaki Saito*)

The North Pacific Marine Science Organization (PICES) is an intergovernmental scientific organization established in 1992 to promote and coordinate marine research in the northern North Pacific and adjacent seas. Its present members are Canada, Japan, Korea, China and Russia.

PICES is now developing a new interdisciplinary programme named FUTURE. The vision of the FUTURE is to understand and forecast responses of North Pacific marine ecosystems to climate change and human activities at basin-wide and regional scales, and to broadly communicate this scientific information to members, governments, resource managers, stakeholders and the public. In the last annual meeting in Victoria (Oct 2007), the open forum on FUTURE and the FUTURE workshop were held and asked PICES community comments on the FUTURE Science

Plan. There are many overlaps in the science plan between FUTUR and IMBER, e.g., studying the mechanisms underlying ecosystem response to natural and anthropogenic forcing, developing effective ways to communicate complexity to policy makers, resource managers, and society, etc. Considering these overlaps and exigency of the issues which scientists are expected to solve, it is quite natural and appropriate way to collaborate of IMBER with FUTURE if the PICES community agree. Julie attended the workshop and showed strong interest of IMBER to collaborate with PICES FUTURE. The importance of the collaboration with external projects such as IMBER was basically accepted by the workshop attendees. The SP of the FUTURE was approved by the Governing Council early in this year (http://www.pices.int/members/scientific_programs/FUTURE/FUTURE_final_2008.pdf). The FUTURE study group is moving to develop the implementation strategy, and is about to hold the implementation planning meeting in Seattle (23-25 April). FUTURE is planned to kickoff in April 2009.

During the last annual meeting, IMBER proposed a topic session to the next annual meeting in Dalian, PRC (Oct. 2008) entitled “End to End food webs: Impacts of a Changing Ocean”. This proposal was approved by the Science Board and GC as an IMBER-BIO committee topic session. Co-chairs are Sinjae Yoo (Korea), George Hunt (USA) and Hiroaki Saito (Japan). Co-chairs are asking travel fund for one invited speaker to IMBER. BIO-committee will support the travel for one invited speaker. More details of the session will be raised in the PICES web site soon. <http://www.pices.int/>

5.8 IGBP (Report by Emily Brévière)

5.8.1 New Executive Director appointed

Sybil Seitzinger will start as Executive Director in September. Hilarie Cutler, graphic designer, back half time. Wendy will be back in August.

5.8.2 Fundraising and added value

There is a cautious optimism about the 2008 budget. National added value reports were done for US and France done, and the reports for Japan and Canada are underway. The secretariat also worked on numerous informal reports. The 20th Anniversary Symposium, was an occasion to talk to private sector representatives. The secretariat is starting to build a library of added value material; showing how IGBP, projects add value to national programs and initiatives.

5.8.3 ICSU/IGFA review

April 2008	Meeting @ IGBP Secretariat with John Lawton, Henning Rodhe; 38 questions, online survey
May 2008	Review panel members @ IGBP Congress, SC
September 2008	First draft of report to Programme for comment
November 2008	Draft of report to ICSU, IGFA members and interdisciplinary bodies for comment
February 2009	Review(s) considered by CSPR, IGFA
April 2009	Review complete

5.8.4 IGBP-WCRP “merge” update

The members of the merge working group are:

- IGBP: Nobre, Matsuno, Stafford-Smith, Werner

- WCRP: Church, Griggs, Ramaswami, Flato
- EDs *ex officio*

The merge working group was never really activated. The recent WCRP JSC decision is to form an internal working group to look at short- and long-term strategy. It was decided to wait for the IGBP, WCRP reviews. The working group will remain inactive for the moment.

5.8.5 Ocean acidification

- Jan 2008: ESF strategic workshop on the “Impacts of Ocean Acidification”
- June 2008: EPOCA kick-off meeting, Nice
- October 2008: Second symposium on “The Ocean in a High CO₂ World”, Monaco

5.9 **SCOR** (*Report by Ed Urban*)

5.9.1 SCOR new working groups in 2007

SCOR WG 131 on The Legacy of in situ Iron Enrichment: Data Compilation and Modeling. SCOR is providing support for a post-doctoral fellow to help gather the data sets from previous natural and artificial iron enrichment experiments. These data will be merged into a dataset that will be held by the BCO-DMO at WHOI. The WG plans to continue its work with the merged data to address several scientific questions.

SCOR/LOICZ WG 132 on Land-based Nutrient Pollution and the Relationship to Harmful Algal Blooms in Coastal Marine Systems. This group is co-funded by the Chinese Academy of Science’s Institute of Oceanology and LOICZ, and aims to bring together into a GIS format data regarding nutrient inputs from land and data on harmful algal bloom events, to test the hypothesis that nutrient inputs can stimulate blooms of toxic algae, not just high-biomass blooms.

The full list is available at: <http://www.scor-int.org/wkgroups.htm>

5.9.2 GEOHAB

Core Research Projects (CRPs) on Upwelling Systems and Eutrophied Systems continue to implement their activities. The latter CRP will hold its second open science meeting in coordination with WG 132’s second meeting and the 2009 SCOR annual meeting, in Beijing in September or October 2009.

5.9.3 Second Symposium on the Ocean in a High-CO₂ World

- Co-sponsored by SCOR, IOC, IAEA, and IGBP on 6-9 October 2008 (see [Web site](#)).
- An economist (Hermann Held) was invited.

5.9.4 SCOR 50th Anniversary Symposium: 20-21 October 2008

SCOR is organizing a 50th Anniversary Symposium to celebrate SCOR’s achievements over the past 50 years and plan for the future. One feature of the meeting will be a poster session for young scientists from SCOR nations. (see [Program](#))

5.9.5 2009 Project Summit

A proposal was submitted for funding. The plan is to support one person from each project to attend. A possible venue is University of Delaware on March or April 2009.

5.10 GLOBEC

5.10.1 Regional projects update

5.10.1.1 *CLIOTOP (Report by Olivier Maury)*

CLIOTOP (Climate Impacts on Oceanic Top Predators). CLIOTOP is a worldwide comparative effort to understand the key processes of oceanic ecosystems and their top predator species and determine the impact of climate variability. CLIOTOP started in 2005 and will last until 2014. The Science Plan and Implementation strategy is available on the web. There is a plan for a mid-term workshop in 2009. The second CLIOTOP symposium is planned for 2011. CLIOTOP plans to produce a synthesis book in 2015.

5.10.1.2 *ESSAS (Report by*

The goal of the ESSAS (Ecosystem Studies of Sub-Arctic Seas) Program is to compare, quantify and predict the impact of climate variability and global change on the productivity and sustainability of Sub-Arctic marine ecosystems. The geographically focus of ESSA is on sub-arctic regions: Sea of Okhotsk, Oyashio, Bering Sea, Hudson Bay, Labrador/ Newfoundland shelves, Gulf of St. Lawrence, West Greenland, Iceland, Nordic Seas, and Barents Sea. ESSAS has four active working groups:

- Regional Climate Predictions
- Ecosystem Modelling
- Bio-Physical Coupling
- Climate and Gadid-Crustacean Interactions

Nationally funded ESSAS projects include: Norway (NESSAS), Iceland (ISE), USA, (BEST), Japan (J-ESSAS).

The 2nd Annual ESSAS Meeting was held in Hakodate (Japan) on June 4-8, 2007. The meeting focussed on the role of sea-ice cover in marine ecosystems, the evaluation of future ESSAS climate scenarios and discussion on modelling approaches within ESSAS.

In December, 32 papers from the Kick-Off Symposium (May 2005, Victoria, Canada) on Effects of Climate Variability on Sub-Arctic Marine Ecosystems were published in Deep-Sea Research II (Volume 54).

ESSAS leads the International IPY Consortium with ESSAR (Ecosystem Studies of Sub-arctic and Arctic Regions). The aim of ESSAR is to addresses how climate variability and change affects the marine ecosystems of the polar (Sub-arctic and Arctic) seas and their sustainability, with special emphasis upon field studies.

Upcoming ESSAS Activities

- 3rd Annual ESSAS Meeting: September 2008, Halifax, Canada
 - Possible Joint Workshop on End-to End Modeling that would include ESSAS, CIOTOP, and ICED before GLOBEC Open Science Meeting
- Workshop on the Role of Advection in Sub-arctic Marine Ecosystems
- Workshop on Developing Downscaling of Future Climate Scenarios to Regional Seas.
- Modelling Workshop

ESSAS Project Office

The Research Council of Norway and the Institute of Marine Research (IMR) in Norway has agreed to fund an ESSAS Project Office in Bergen. A ESSAS Coordinator will be hired soon.

The position will be half-time and will be combined with a half-time physical oceanographic position at IMR to work on ESSAS related work on sub-polar seas.

5.10.1.3 ICED (Report by Eileen Hoffmann)

Eileen gave an overview of the Integrating Climate and Ecosystem Dynamics (ICED). The vision is to develop a circumpolar, interdisciplinary approach to understand climate interactions in the Southern Ocean and implications for ecosystem function and feedbacks to biogeochemical cycles. Some major objectives are to implement circumpolar instrumentation and field studies, extend and further develop circulation, ecosystem, and biogeochemical models and stimulate capacity building. One of the challenges is to combine the ecosystem and biogeochemical communities. The Science and Implementation Plan was reviewed and a revised version submitted to IMBER and GLOBEC SSCs.

ICED Food Web Modeling Workshop

This workshop was held 16-18 April 2008 at CCPO/ODU in Norfolk, VA. About 30 participants working in biogeochemical modeling, food web, fisheries and physical modeling attended the workshop. The meeting structure consisted of plenary presentations and breakout groups. The funding for the workshop was provided by GLOBEC, IMBER, EUR-OCEANS, SCOR, SO GLOBEC, BAS, CCPO/ODU. The workshop was aimed at begin the process of developing basis for generating models of circumpolar Southern Ocean ecosystems. The focus was put on Southern Ocean food web models (structure of SO food webs and SO food web response to climate change).

Further products from the workshop will be: Workshop Report, GLOBEC/IMBER newsletter article, overview paper on Southern Ocean food webs for peer-reviewed journal such as MEPS.

Response to revised ICED SPIS (report by Mary-Elena Carr and Svein Sundby)

Mary-Elena presented a summary of the evaluation of the revised version. ICED presented a 30 pages listing/responding to reviewer comments with mixed thoroughness.

The reviewers addressed many topics:

- The balance between the range of topics: OK
- Effects of future climate change: Good
- Physical forcing as driver in ecosystem models: Good
- Carbon cycle: Improved but still has errors.
- The implementation of integrated modeling: Good
- Data management: Good!
- Geographical focus: OK, but still weak open ocean
- Links to the management of the living marine resources: Good!
- Collaboration and links to other organizations: Good!

However, the responses to the reviewers' concerns are not always sufficient responses.

It was noted that several requested topics will be addressed in ICED workshops. Although there is no detailed proposal, it is suggested that the SPIS must provide a basis to develop ICED, to educate junior scientists, and to identify priorities for proposal solicitations.

There are three major issues of the ICED SPIS that need iteration:

- **Legacy and outcomes** (and the debate of whether the program is forward-looking): it is unclear what will be coming out of the program and which science questions will be resolved by ICED.

- **Carbon cycle science:** still errors on reason for low calcification of Southern Ocean waters
- **Need referencing** (i.e. references or examples) and serious **editing**

Thanks were extended to Mary-Elena and Svein for their work with the review. A discussion was held about the revised version of the ICED SPIS and recommendation to be made.

ICED should be encourage to interact with CLIOTOP and ESSAS. The consensus is to accept the revised SPIS but ask for revision. Most of the revision can be handled between the Chairs and Executives of GLOBEC and IMBER and it is decided that there is no need for a third review.

ICED SSC membership:

Previously concerns were expressed about the proposed SSC membership: gender balance, geographical distribution and Asian representation. In an effort to address those concerns, Eileen and Eugene revised the ICED SSC membership that is now up to 14 members. Eileen asks for guidance for membership.

Action: Jean-Pierre Gattuso offers to revise the carbon cycle error and report back to Julie and Ian.

Action: Julie and Ian to draft a letter of recommendation about the revised ICED SPIS, forward comments and suggestions to Eileen and Eugene.

Action: Jing Zhang, Arthur Chen and Hiroaki Saito to suggest potential Asian members for the ICED SSC.

Action: Sylvie to send ICED report to GLOBEC IPO.

5.10.2 BASIN

BASIN is organizing a session at the ASLO in St-John's (June 2008) to meet with program managers and funding agencies. BASIN has no focussed on biogeochemistry but some activities will be related to CAMEO. There is no call under FP7 for BASIN's activities, but maybe funding through DFO and NSF.

5.10.3 Transition Task Team

A Transition Task Team (TTT) was appointed jointly by SCOR and IGBP and tasked with the preparation of this addendum to the IMBER Science Plan and Implementation Strategy that will define the additional science to be included in the IMBER project after the conclusion of GLOBEC.

Membership:

Food web dynamics	-	John Field (Chair)
Modelling	-	Eileen Hofmann
Human dimensions	-	Kathleen Miller
Upper trophic levels	-	Olivier Maury
Middle trophic levels	-	Roger Harris
Lower trophic levels	-	Mike Roman
Biogeochemistry	-	Hugh Ducklow
Climate dynamics	-	Ken Drinkwater
Fish	-	Yoshi Oozeki or Qisheng Tang

In preparing this supplement to the IMBER Science Plan and Implementation Strategy the Task Team will consider:

- New developments in marine ecosystem science,

- Key new scientific questions arising from GLOBEC,
- Scientific results of IMBER to date,
- Projects currently within GLOBEC that are planned to continue after 2009.

The Transition Task Team may include recommendations for mechanisms to facilitate the transition, including representation in programmatic structures.

The timetable for this activity will be as follows.

- Nov 2007-April 2008: discussion/drafting within TTT by email
- July 2008: first meeting of TTT in Plymouth (UK)
- August-Nov 2008: TTT continues working on draft and sends to Execs
- Sept 2008: report on activities to IGBP and SCOR Officers
- Nov-Dec 2008: 2nd meeting of the TTT with input from the Execs
- Dec 2008: public posting of draft (e.g., on websites) and request for comment from GLOBEC/IMBER mailing list, etc.
- Mar 2009: TTT collects all submitted comments and prepares a 2nd draft
- May 2009: presentation at GLOBEC OSC
- Jun-Jul 2009: final touches based on OSC and other comments
- Aug 2009: review by IGBP and SCOR
- Sep 2009: presentation of final report to GLOBEC, IMBER, IGBP and SCOR
- Oct 2009: discussion/approval by the IGBP and SCOR Officers

5.10.4 Other joint activities

5.10.4.1 *CLIMECO*

(See section 5.6)

5.10.4.2 *IMBIZO*

(See section 3.7)

5.10.4.3 *Upwelling Symposium*

The symposium will consider most aspects of the dynamics, structure and functioning of the four major eastern boundary upwelling ecosystems linked to the Benguela, California, Canary (African Canary and Iberian Peninsula) and Humboldt Current systems. These aspects include climate and ocean dynamics, climate change, physics of the ocean and atmosphere, biogeochemistry, ecosystem production, ecology (including behavioural ecology), food-web structure and dynamics, trophic interactions, fisheries assessment and management. Three hundred and fifty participants are expected. Coleen Moloney is a member of the organizing committee and will be attending the symposium.

5.10.4.4 *Rome Symposium*

The GLOBEC Focus 4 Symposium on “Coping with global change in marine social-ecological systems” will be held in Rome (8-11 July 2008). IMBER is a co-sponsor for this meeting. The symposium aims at bringing together scientists from marine ecosystems and social sciences. One hundred and seventy eight abstract were submitted.

5.10.4.5 *GLOBEC OSM*

GLOBEC will hold its final 3rd Open Science Meeting in Paris (late May 2009). This conference will feature a session on the transition to IMBER rather than final closure of GLOBEC. GLOBEC invites the IMBER SSC to contribute actively to the organisation of the conference. Julie is a member of the organizing committee. The plan is to have 2 days of workshop from the broad marine community and 3 days from the GLOBEC community (plenary and invited speakers).

6 Update on country activities for IMBER project

6.1 Canada (Report by Jay Cullen)

IPY The Canadian Government announced that \$150 M CDN (\$20 M of which is earmarked for icebreaker activity) would be made available to fund research in the Arctic for IPY (2007-2008). A total of 44 science and research projects were awarded funding on a competitive basis.

IMBER-GEOTRACES Links in IPY - The Canadian GEOTRACES initiative was originally funded under IPY to pursue studies of trace elements and isotopes in the Arctic in 2008. Due to limited ship availability the research cruise has been postponed until 2009. A single cruise on the CCGS Amundsen in the summer field season of 2009 is in the planning stage to study the effect of climate change on nutrient and carbon cycles in the Arctic Ocean. A principal investigator meeting is scheduled during the Canadian Meteorological and Oceanographic Society congress in Kelowna, BC; May 25-29 to discuss the details of the cruise plan. Collection of preliminary data and samples from ships of opportunity in various regions of the Arctic occurred in 2007 and will occur in the summer field season 2008.

OCEAN OBSERVATORIES IN CANADA

VENUS (VICTORIA EXPERIMENTAL NETWORK UNDER THE SEA) (<http://www.venus.uvic.ca/>) Two new nodes were installed and went online delivering data to shore this February. The nodes are located in the Strait of Georgia that separates Vancouver Island from the mainland of British Columbia, Canada. One node was deployed in 170 m of water on the margin of the deep basin and one in 40 m water in the Fraser River Delta fan. The addition of these nodes to the existing Saanich Inlet node (anoxic fjord) will allow the physical, geological, chemical and biological dynamics of this busy marine thoroughfare to be studied. Real time and archived data are available for download at the project website.

NEPTUNE (NORTHEAST PACIFIC TIME-SERIES NETWORKED EXPERIMENTS) (<http://www.neptunecanada.ca>) **IN THE WATER Nov. 2007!** Following the installation of the 800-km backbone cable, repeaters and branching units (see map on website) and much of the post-lay burial work across the two continental shelf routes last fall, NEPTUNE Canada is preparing to install instrument nodes. Operating funds for the network are expected to be released shortly and instruments for experiments deployed in late 2008 or early 2009.

6.2 China (Report by Jing Zhang)

The China GLOBEC/IMBER national project is combined as China GLOBEC III with IMBER I project (herein after “973” project), which is giving a priority to the marine biogeochemical cycles and key processes of end-to-end food web dynamics in the Yellow Sea and East China Sea. The project is entitled: “Key Processes and Mechanisms of Sustainable Food Production in the Coastal Ocean of China” (2006-2010), funded by Ministry of Science and Technology of China (MOST). In 2006-2007, the project focussed on 3 research foci on:

- 1) diversity of biological functions and trophodynamics of end-to-end food web in Yellow Sea Cold Water (YSCW);
- 2) impact of Kuroshio and land-source inputs on the nutrient dynamics and food production in the shelf of East China Sea, and
- 3) biogeochemistry and carrying capacity in typical mariculture areas.

Fourteen cruises and 216 days for focus 1 and focus 2 above was carried out by R/V “Bei Dou”. Focus 3 ended in the Sungou Bay of Shandong Province in the North China and the Xiangshan Bay of Zhejiang Province in the South China. The many surveys allowed integrating six major research topics:

- Bloom processes of phytoplankton, with emphasis on the development of the bloom and its contribution to food production of the ecosystem ;
- Relationship between zooplankton and higher trophic-level living resources;
- Nutrient replenishment on the East China Sea Shelf;
- Nutrient supply in the coastal spawning ground of East China Sea;
- Mechanisms of the formation and seasonality of coastal hypoxia off the Changjiang Estuary;
- Biogeochemical cycle and ecological carrying capacity in typical marine culture areas.

The on-going China GLOBEC/IMBER national project succeeded with level A grading in the mid-term evaluation administered by MOST in January 2008, which will guarantee the funding for the next three years. The total funds for next three year amount to US\$2.8million dollars, which is little high than original plan. The sea-going surveys in 2008-2009 are under development and planning. They will address the following themes:

Focus 2: Investigation of fishery spawning-ground for key living resources in the East China Sea Shelf offshore the Zhejiang and Fujian Provinces. Two cruises are planned for about 30 days in May and June, 2008.

Focus 1: Trophic dynamics and the interactions of main functional groups in the food web from end-to-end. The cold water mass area of Yellow Sea is chosen as the target region for implementation. The sea-going survey will be separated into three phases, that is, spring bloom and phytoplankton, zooplankton feeding and change in function group, and response by high trophic-level living resources. The sea going cruise for this topic is about 50 days in 2009.

Focus 3: Building-up of new food production demonstration models on the basis of poly-culture practices in bay area. The routine investigation of Sungou Bay is about 40 days in 2008. It mainly examines the biogeochemical cycle and ecological carrying capacity in shellfish/algae culture areas in Shandong Province with comparison to fish cage culture areas in Zhejiang Province.

Prof. Qisheng Tang, Leading Scientist of the China GLOBEC/IMBER national project

E-mail: ysfri@public.qd.sd.cn.

Prof. Jing Zhang, Assistant to Leading Scientist of the project

E-mail: jzhang@sklec.ecnu.edu.cn

6.3 France (Report by Jean-Pierre Gattuso)

The French program CYBER (Biogeochemical Cycles, Ecosystems and Resources) the marine science component of the CNRS/INSU LEFE national program was launched in 2006. Contacts are Hervé Claustre (claustre@obs-vlfr.fr) and Marie-Alexandrine Sicre (marie-alexandrine.sicre@lsce.ipsl.fr). Scientific activities within CYBER are organized in four foci, some being the French counterpart of international programs (SOLAS, GEOTRACES, IMBER). Focus 1, the French contribution to IMBER, focuses on ecosystem structure, functional diversity and biogeochemical cycles in the ocean. This theme encompasses field observations, laboratory experiments and models.

In 2007, two large multidisciplinary field projects were in the process of data synthesis. The KEOPS project (KErguelen Ocean and Plateau compared Study) started with a *Nature* paper (Blain et al., 2007. *Nature* 446:1070-1074) and proceeded with the publication of 25 papers in a [special issue of Deep Sea Research II](#) in 2008. This issue will contain detailed reports on major findings in physics and biogeochemistry including modeling. Papers on molecular biology,

biooptic modeling are in preparation. A synthesis on the role of dust deposition in the southern ocean will also be produced. Additional modeling studies and the comparison with other iron fertilisation experiments, such as CROZEX are also on the agenda.

The BIOSOPE (Biogeochemistry and Optics South Pacific Experiment) project is preparing a [special issue for the journal Biogeosciences](#) which be completed by mid 2008, gathering about 35 papers. The volume will be organized around three main topics (biology/biodiversity, biogeochemistry and optics / bio-optics).

In 2007, the TWISTED (ToWard Integration of Subgrid Turbulence in Ecosystem Dynamics) project has also been launched for three years. It is devoted to the understanding of the large scale impacts of mesoscale turbulence on ecosystem dynamics and improvement of their representation in global Ocean General Circulation Models (OGCMs). Achievements of this project represent a big challenge for climate studies, and to take up this challenge requires the strengthening of the community around interdisciplinary approaches.

In June-July 2008, the BOUM (Biogeochemistry from the Oligotrophic to the Ultra-oligotrophic Mediterranean) project will organize a cruise with the aim to give a longitudinal description of the biogeochemistry and biological diversity of the Mediterranean Sea and produce a detailed study of the biological production and its subsequent fate in 3 sites.

Other on-going projects are presented on the CYBER web site: http://www.obs-vlfr.fr/proof/index_vt.htm.

6.4 Germany (Report by Arne Kortzinger)

Collaborative Research Centre "Climate-Biogeochemistry Interactions in the Tropical Ocean"

Partners: IFM-GEOMAR, Kiel and Christian-Albrechts-University, Kiel

The overall goal is to improve understanding of the coupling of tropical climate variability and circulation with the ocean's oxygen and nutrient balance to quantitatively evaluate the nature of oxygen-sensitive tipping points, as well as to assess consequences for the ocean's future.

Coordinator: Doug Wallace

Start: Jan. 1, 2008

Duration: 12 years; 1st phase: 4 years; two more 4-year phases are expected

Funding phase 1: 9.3 Million Euros

Geochemistry and Ecology of the Namibian Upwelling System (GENUS)

Topic: Influence of climate change on biogeochemical cycles and ecological processes

in the coastal upwelling system of the Southeast Atlantic Ocean

Co-ordinators: Prof. Dr. Kay-Christian Emeis, Institute of Biogeochemistry and Marine Chemistry, University of Hamburg

Prof. Dr. Wilhelm Hagen, Department of Marine Zoology, University of Bremen

Participating Institutions/Persons:

- Biological Institute Helgoland, Helgoland (Buchholz)
- Institute for Hydrobiology and Fisheries Science, University of Hamburg (Christiansen, Koppelman)
- Institut for Coastal Research, GKSS, Geesthacht (Schröder)
- Institute for Baltic Sea Research, Warnemünde (Fennel, Mohrholz, Schmidt, Wasmund)
- Max-Planck-Institute for Meteorology, Hamburg (Jacob)
- Center for Tropical Marine Ecology, Bremen (Ekau, Rixen, Kunzmann)

Funding requested:

2 Million Euro for 3 years

Status:

Submitted to Federal German Research Ministry (BMBF)

Biological Impacts of Ocean ACIDification (BIOACID)

Submission of full proposal: May 2008; Peer-review: Fall 2008

Coordinator: IFM-GEOMAR (U. Riebesell)

Partners: 15 partners, including 8 universities, 1 SME

Proposed start: February 2009

Duration: 3 years (phase 1)

Requested funding: € 3 Mio./year

Objective: BIOACID will assess uncertainties, risks and thresholds related to ocean acidification (OA) at molecular, cellular, organism, population, community and ecosystem scales. It will

- contribute to determining the **impacts of OA on marine biota** and their potential for acclimation and adaptation,
- improve our understanding of **OA-related ecosystem changes**, including both pelagic and benthic habitats, synthesize information for ecosystem modelling and determine critical thresholds,
- assess the consequences of OA-induced biological responses on elemental cycling and **biogeochemical feedbacks to the climate system**.

6.5 India (*Report by Wajih Naqvi*)

The Tenth Plan concluded in 2007, and several new projects relevant to IMBER were initiated in the Eleventh Plan. A Tenth Plan project, "Impact of anthropogenic perturbations on oceanographic – atmospheric processes in and around India in the context of Global Change" was, however, given a 1-year extension (until March 31, 2008). This project, coordinated by the National Institute of Oceanography (NIO, Goa) comprised three activities:

- Transport and transformations of nitrogenous fertilizers from agricultural field to the ocean: Impact on coastal ecosystem and exchanges with atmosphere
- Reconstruction of upwelling intensity/anoxia on seasonal to centennial time scales from coral and sedimentary records
- Long-term time-series measurements including calibration of critical atmospheric and oceanographic parameters

For the time-series work, the coastal section off Goa (consisting of five stations to a depth of 28 m), has been regularly sampled by NIO since 1997. A new mooring consisting of three sediment traps and one current meter has been deployed at 17°N, 68°E during a cruise of the R/V *Meteor* in October 2007. The Germans also re-deployed the sediment traps at their Western Arabian Sea Trap (WAST) site after a gap of several years. The two moorings will be jointly looked after by the Indian and German researchers.

The ongoing Eleventh Plan projects at NIO relevant to IMBER are:

1. Understanding coastal upwelling: A system biology approach to delineate web-dynamics from primary to tertiary levels.
2. Eco-biogeography of the estuarine and coastal waters of the southwest coast of India.
3. Physical and biogeochemical dynamics of estuarine and coastal ecosystems along the east coast of India.
4. Mapping of marine biodiversity along the Indian coast.
5. Indian climate and phytoplankton variability.
6. Biogeochemical and ecosystem responses to global climate change and anthropogenic perturbations, and transfers across interfaces in the North Indian Ocean.

A noteworthy activity was the organization of two collaborative cruises on board the R.V. *Roger Revelle* in August-October 2007 involving researchers from India (NIO) and USA (University of Southern California, Woods Hole Oceanographic Institution, Princeton University and University of Washington). The principal issues addressed by the first cruise that focused on upwelling areas of the western Arabian Sea included (a) Potential for iron limitation in upwelled waters, (b) Mechanism(s) of formation of the intermediate nepheloid layer in oceanic oxygen minimum zones (OMZs), and (c) Iron speciation and cycling in suboxic waters. The second cruise largely sampled the OMZ of the central Arabian Sea dealing with the following scientific topics: (a) Relative importance of heterotrophic denitrification and anaerobic ammonium oxidation (ANAMMOX), (b) Natural isotope abundance in dissolved inorganic nitrogen species, and (c) Molecular characterization of microbial community.

The Centre for Marine Living Resources and Ecology (CMLRE), Cochin, under the Ministry of Earth Sciences continues to support a project on Marine Living Resources under which dedicated cruises using the R.V. *Sagar Sampada* are being conducted throughout the year focusing on biogeochemical processes and fisheries resources of the Indian exclusive economic zone (EEZ). The project, being implemented with the Regional Centre of NIO at Cochin serving as the nodal agency, among other things, includes studies of the Arabian Sea suboxic zone which supports an amazingly large biomass (~100 million tonnes) of mesopelagic fish (myctophids), which probably contributes significantly to biogeochemical fluxes in the region.

Among the proposals funded in the Eleventh Plan, there is one on Iron Fertilization in the Southern Ocean being implemented as a CSIR Network Project in collaboration with Centre for Cellular and Molecular Biology, Hyderabad, CSIR Centre for Mathematical Modelling and Computer Simulation, Bangalore, and National Environmental Engineering Research Institute, Nagpur. This experiment, called LOHAFEX (*Loha* Fertilization Experiment; *Laha* means iron in Hindi), will be carried out in Scotia Sea during January-March, 2008, on board the R.V. *Polarstern*. The Alfred-Wegener Institute of Polar and Marine Research (AWI), Bremerhaven, Germany, to which this vessel belongs is the other major collaborating institution in the project which will also involve researchers from France, Italy, Spain and USA.

6.6 Japan (*Report by Hiroaki Saito*)

POMAL (Population Outbreak in Marine Life) is a new IMBER-JAPAN project for 2007-2012 studying the marine ecosystem responses to the natural and/or anthropogenic environmental changes, funded by the Agriculture, Forestry and Fisheries Research Council (AFFRC). The goal is to understand the mechanisms of marine ecosystem responses to environmental changes in order to make scientific advices for sustainable use of marine fisheries production and applicable fisheries management. POMAL is constituted by a couple of subprojects, one is SUPRFISH (Studies on Prediction and Application of Fish Species Alternation) and the other is STOPJELLY (Studies on Prediction and Control of Jellyfish Outbreaks). In spring 2008, SUPRFISH carries out field campaign using three research vessels and various remote sensing equipments such as ARGO-O₂+Chl, GLIDER in the Kuroshio Extension region.

Several IMBER related studies are on-going in the western North Pacific. **BLOSSOM** (BLOoming Plankton Succession Study in the Oyashio Marine ecosystem) carried out 5 successive cruises from March to July 2007 to understand the plankton and nutrient dynamics and the influences of the water mass distribution in the Oyashio region. **OECOS** (Oceanic Ecodynamics COMparison in the Subarctic Pacific) is the PICES recommended project. Continuous samplings were done in the fixed station for 2 weeks in March and 4 weeks in April, 2007, in the Oyashio region. Amur-Okhotsk project is mainly conducted by the scientists of Hokkaido

Collaboration with Chinese and Russian colleagues: Human activities in northeastern Asia and their impact on the biological productivity in the North Pacific Ocean. They had several cruises in the Sea of Okhotsk using Russian RVs to investigate the impact of Amur river water and the sea ice formation to the biogeochemical and biological processes in the Sea of Okhotsk. One of the main findings is that the importance of the resuspension of organic from the continental shelf off Sakhalin. The turbid and iron-replete water disperse into the Sea of Okhotsk and the western subarctic Pacific, and characterize the biogeochemical cycling.

IMBER-JAPAN National Committee held a symposium entitled “The subarctic and subtropical western North Pacific: their characteristics and interfrontal interaction” in 21 Jan. in Tokyo. The foci of the symposium are mesopelagic layer and the interaction between subtropical and subarctic waters. We discussed the potential future proposal of IMBER sciences. IMBER-JAPAN NC met again in 25-26 Feb in Nagoya with Japan-SOLAS NC. The main issue was the Hakuho Maru cruise from 29 July to 12 Sep., 2008. The first leg is in the subarctic Pacific mainly for SOLAS sciences and the second leg is the meridional transect of the western North Pacific mainly for IMBER sciences

6.7 The Netherlands (*Report by Jack Middelburg*)

In the Netherlands, there is no separate program or funding possibility for IMBER, nor for GLOBEC, SOLAS, GEOTRACES or LOICZ II. In the context of focus and mass, Dutch funding agencies have decided to join forces and to implement a national programme for Marine and Coastal research (ZKO) incorporating applied, strategic and basic research. Details of the programme can be downloaded from: http://www.nwo.nl/nwohome.nsf/pages/NWOA_795JFX_Eng. Two rounds have been completed, one for applied, coastal research focussing on the Dutch Wadden Sea and one for basic research on carrying capacity of coastal systems and the North Sea. The basic research programme includes a programme on the nitrogen cycle of the North Sea aiming to integrate biogeochemical and molecular biology tools. Another round is open for submission till May 15 and involves open ocean research. However, submission is open only to pre-proposals selected. Most of these proposals concern the Atlantic Ocean with a few in the Mediterranean Sea and one or two in the Indian Ocean. Consequently, it is unlikely that the Dutch will have a large Indian Ocean programme the coming years. However, cruises are scheduled for early 2009 (based on prior funded projects). Some of the research proposed is highly relevant for IMBER.

6.8 New Zealand (*Report by Julie Hall*)

A proposal for cruise collecting bacteria and fish data for trophic model was declined. Third cruise will be on September-October to study the spring bloom in mesopelagic area.

6.9 South Africa (*Report by Coleen Moloney*)

A marine biogeochemistry workshop was held in August 2007 to try and co-ordinate local (national) biogeochemical research and to align it with international efforts. The workshop was organized by Neil Swart (UCT). Progress to strengthen this initiative is slow, partly because of limited capacity.

In 2007, a new research facility was established: the Africa Centre for Climate and Earth System Science (ACCESS) (www.africaclimatescience.org). The first Director is Prof. George Philander. The focus of ACCESS is on climate-related phenomena that range from transient fluctuations in conditions on land and in the adjacent oceans, to future climate changes associated with global warming. The main research goals relate to predicting changing climatic conditions on time-scales from seasons to decades.

A Southern African SOLAS (Surface Ocean - Lower Atmosphere Study) network is starting to take shape, co-ordinated by Dr Carl Palmer (UCT). Many of the people involved in this network carry out IMBER-type research.

The marine research agenda in South Africa has a strong ecosystem focus, with the main national research funding being accessed through the SEACChange (Society, Ecosystems And Change) programme. This research is carried out mainly at universities and semi-autonomous research institutions, but the government branch of Marine and Coastal Management also makes a strong fishery-ecosystem contribution.

6.10 Spain (*Report by Javier Aristegui*)

Spain doesn't have a proper IMBER-funded program with targeted projects. However, there are many running projects and activities, which are closely related to the IMBER goals. Following we have summarized these, according to the main themes and issues in which the IMBER Science Plan is structured. More detailed information on the specific objectives of each of the IMBER-related projects is provided in a separate document.

A. Projects

Theme 1.- Interactions between biogeochemical cycles and marine food webs

1. *Study of the chemical behavior of iron in seawater in the presence of organic compounds derived from phytoplankton.* P.I.: Juana M. Santana-Casiano (University of Las Palmas GC)
2. *Biogeochemical fluxes in temporal physical structures of the NW Mediterranean coast and their relation to biological processes.* P.I.: Montserrat Vidal (Dep. Ecology, University of Barcelona)
3. *Shelf-ocean exchanges in the Canaries-Iberian Large Marine Ecosystem (CAIBEX)* P.Is.: Eric D. Barton (IIM-CSIC); Javier Aristegui (University of Las Palmas GC)
4. *Oceanic Eddies and Atmospheric Deposition in the Canary Current (subtropical Northeast Atlantic): monitoring, biological and biogeochemical effects, and fluxes to the ocean interior (RODA).* P.Is.: Javier Aristegui (University of Las Palmas GC); Pablo Sangrá (University of Las Palmas GC); Susana Agustí (IMEDEA-CSIC)
5. *Upwelling current off northwest Africa (CANOA)* P.I.: Josep L. Pelegrí (CMIMA-CSIC)
6. *Effects of meteorological-hydrographic disturbances on the structure of the plankton community (PERPLAN)* P. I.: Enrique Nogueira (Spanish Institute of Oceanography, Gijón).
7. *Trichodesmium spp. and N₂ fixation in the tropical Atlantic (TRYNITROP)* P. I.: Emilio Marañón (University of Vigo)
8. *Role of microzooplankton in marine food webs dynamics: functional diversity, relevance in C, N and P cycles, and trophic impact on primary producers* P.I.: Albert Calbet (CMIMA-CSIC)
9. *Sources of organic matter, microbial diversity and ecosystem functioning (respiration and carbon use) in the coastal pelagic marine ecosystem (MODIVUS)* P.I.: Josep M. Gasol (CMIMA-CSIC)
10. *Protozoans and viruses: Biomass control and diversity, and their impact on biogeochemical cycles in a costal Mediterranean site (PROCAVIR)* P.I.: Dolors Vaqué (CMIMA-CSIC)

Theme 2- Sensitivity to Global Change

11. *Climate control on Holocene variability in Arctic sea-ice and marine carbon export production (ICECARB)* P.I.: Rosell, Mortyn, Zahn, Ziveri (UAB)
12. *Atmosphere- ocean interchange study of CO₂ along the Canary Islands-Western Mediterranean Sea section using a volunteer observation ship (ICCABA)*. P.I.: Melchor González-Dávila (University of Las Palmas GC)
13. *Effects and Response of Marine Organisms to the Imminent Acidification of the Oceans: A Multi-Temporal Study (ROMIAT)*. P.I.: Carles Pelejero and Eva Calvo (CMIMA-CSIC)
14. *Marine carbon sources and sinks assessment- EU project (CARBOOCEAN)* P.Is.: Aida F. Ríos (IIM-CSIC); Melchor González-Dávila (University of Las Palmas GC)
15. *Integration and enhancement of key existing European deep-ocean Observatories. EUROSites* P.I.: Melchor González-Dávila (University of Las Palmas GC)

Theme 3- Feedbacks to the earth system

16. *Oceanic water-mass multiparametric mixing model (M4AO)* P.I.: Fiz Fernández Perez (IIM-CSIC)
17. *Atmospheric inputs and organic carbon and pollutants to the Polar Ocean: rates significance and Outlook (ATOS)*. A Spanish component of the OASIS program. P.I.: Carlos Duarte (IMEDEA-CSIC)

B. Meetings

1. *“Strategic Workshop on Ocean Acidification”*.
Gran Canaria (28-30 January 2008). European Science Foundation.
Local Organizer: M. González-Dávila
2. *“Workshop - Shedding light on the dark ocean: Breaking paradigms in biogeochemistry, diversity and plankton metabolism in the meso- and bathypelagic realm”*.
Noordwijkerhout, Netherlands (4-8 February 2008). Sponsored by Eur-Oceans
Convenors: G.J. Herndl, J. Arístegui, JM Gasol and F. Thingstadt.
3. *“International Symposium on the Effects of Climate Change on the World’s Oceans”*
Gijón, Spain (19-23 May 2008)
Convenors: L. Valdés, W. Peterson, J. Church
4. *“Eastern Boundary Upwelling Ecosystems Symposium: integrative and comparative approaches”*
Gran Canaria (2-6 June 2008). Sponsored by IMBER, SOLAS and GLOBEC
Convenors: P. Freon, J. Arístegui, M. Barangé

6.11 United Kingdom (Report by Carol Robinson)

OCEANS 2025 – The NERC Marine Centres’ Strategic Research Programme 2007-2012 The Oceans 2025 programme (a partnership of seven leading UK marine centres) aims to improve understanding of how the ocean behaves, how it is changing, and what this means for society. There are nine science themes within Oceans 2025 (www.oceans2025.org), of which most are relevant to IMBER : Climate, circulation and sea level (Theme 1), Marine biogeochemical cycles (Theme 2), Shelf and coastal processes (Theme 3), Biodiversity & ecosystem functioning (Theme 4), Continental margins and deep ocean (Theme 5), Sustainable marine resources

(Theme 6), Technology development (Theme 8), Next generation ocean prediction (Theme 9), Sustained observations, including the Continuous Plankton Recorder Survey and the Marine Mammal Survey (Theme 10).

Theme 2 investigates topics such as

1. i) The importance of the C and N cycles in the regulation of microbial communities and hence export and biogenic gas cycling,
2. ii) The biological pump and export of carbon into the ocean's interior,
3. iii) Processes that introduce nutrients into the euphotic zone,
4. iv) The direct impact of a high CO₂ world (acidification) on mixed layer biogeochemical cycles and
5. v) The indirect impact of a high CO₂ world (increased stratification and storminess) on the supply of nutrients to the upper ocean, and hence on the biological carbon pump and air-sea gas fluxes.

Specific objectives within Theme 5 include

1. To determine how the properties of the twilight zone are structured by surface ocean processes and
2. ii) To quantify and model the rates of downward flux and biogeochemical transformations of biogenic matter in the twilight zone, those within Theme 9 include: To improve our understanding of the causes of model uncertainty (inaccuracy), quantifying and reducing this uncertainty, and thereby improving short and long term forecast capability, in both ocean-only and coupled ocean-atmosphere models, and within Theme 10: The Atlantic Meridional Transect programme (AMT www.amt-uk.org) continues an extended time series (1995-2011) of spatially extensive and internally consistent observations on the structure and biogeochemical properties of planktonic ecosystems in the Atlantic Ocean, for use in the development and validation of models related to the global carbon cycle.

Marine Biogeochemistry and Ecosystem Modelling Initiative in QUEST. **MarQuest** is a NERC funded programme to improve descriptions of marine biogeochemistry, suited for the next generation of Earth system models. The programme will systematically compare a range of approaches with one another and with observations, in order to determine the strengths and weaknesses of the different formulations to a given problem. Particular effort will be put into (1) an examination of the interaction of the biogeochemical models with the descriptions of ocean physics (2) the representation of plankton functional types for marine ecosystems, (3) the development of new methods to evaluate and compare ecosystem and biogeochemistry models and (4) developments to incorporate the coastal ocean into global models.

The Advances in Marine Ecosystem Modelling Research (AMEMR) programme remains active having run a workshop on operational oceanography in November 07 with a workshop on DMS modelling planned for 12-14th May 08. The second AMEMR symposium will be held in Plymouth between the 23-26th June 08. Workshop reports, application forms and details of the symposium can be found at <http://www.amemr.info/>.

The Dynamic Green Ocean Project (http://lqmacweb.env.uea.ac.uk/green_ocean/index.shtml) is funded by EurOceans and NERC QUEST to bring together physical, chemical, biological and paleo-oceanographers with a common interest in modelling and its applications to Earth system problems, to develop a new, more comprehensive model of the oceanic compartment of the Earth system; with a view to improving our understanding of the functioning of the global ocean in the past, present and future.

Other NERC funded research relevant to IMBER is detailed in http://www.imber.info/national_activities/UK_NERC_IMBER_science.pdf. As new grants are awarded they are posted at : <http://www.nerc.ac.uk/funding/available/researchgrants/awards/>.

6.12 United States of America *(Report by Mike Roman and Mary-Elena Carr)*

Currently, the US contribution to IMBER is through the US Ocean Carbon and Biogeochemistry (OCB) program. The role of OCB is to promote, plan and coordinate collaborative, multidisciplinary opportunities within the US and with international partners. Scientific field and model studies in IMBER related areas are funded by NSF, NASA and NOAA in topics including nitrogen fixation, air sea gas exchange, micro- and macro-nutrient dynamics, and ecosystem function at community, organism, and molecular levels. OCB contributed to the SIBER science plan writing workshop in Goa India in November, 2007; coordinated an Ocean Acidification Workshop in La Jolla, California October, 2007; and will coordinate a workshop on Terrestrial and Coastal Carbon Fluxes and Exchanges in the Gulf of Mexico in St. Petersburg, Florida May 6-8, 2008. Reports and information on these workshops and OCB activity can be found at: www.us-ocb.org.

CAMEO has a call for proposal out now. It is a five year program (10M K/year). It is focussed on ecosystem based management and includes a human dimension component. They may be able to support IMBIZO-2 through NSF or NOAA.

7 IMBER Implementation activities

7.1 IMBER Future activities and strategy *(Discussion led by Julie Hall)*

Julie set up the stage for a discussion on the legacy of IMBER and what actions are needed to reach it. Julie asks for suggestion from the SSC members: What should be the legacy of IMBER?

7.1.1 Integration of biogeochemistry and ecosystems

- Framework for the future oceans: ecosystems response level;
- Support from national committees;
- Identify themes rather than problematic; one example is Ocean depletion;
- Integrate themes between projects;
- Regional studies are key: SIBER, ICED, BASIN;
- Emphasis on particular goals:
 - coastal-offshore,
 - deep-ocean,
 - mesopelagic,
 - end-to-end,
 - Ocean acidification

7.1.2 IMBIZO-2 topics

- Global theme should be integration of biogeochemistry and ecosystems
- Comparative ecosystems structure and biogeochemistry (CAMEO): system based management
- Oxygen depletion – Ecosystems impacts (link with urea and upwelled waters)
- Molecular techniques: link to ecosystems
- Reconcile biogeochemistry ecological estimates in the ocean (i.e. respiration)
- Use of IOC funds for capacity building and policy (iron fertilization)
- iron fertilization
 - SCOR Working group on data rescue and synthesis
 - Policy aspects and human dimension

- Biogeochemistry
- End to end food web effects
- Start with iron and include other elements
- When? Early 2010, it should be held in Europe.
- Funding possibilities: NASA (satellite), CAMEO, NSF-NOAA, OCB (scoping workshop on O2 data)
- It is proposed to include the following three workshops:
 - Reconcile biogeochemistry ecological estimates in the ocean (Co-conveners: Mary-Elena and Javier)
 - Comparative ecosystems structure and biogeochemistry (Mike)
 - Oxygen depletion – Ecosystems impacts (Arne and Niki)

7.1.3 Synthesis activities

- IMBIZO are synthesis activities;
- Link the three workshops;
- Synthesis papers across and within workshops;
- Approach journals for special issues: journal that can be found in reference search (Progress in Oceanography, AGU journals, Deep-Sea Research,...);
- Consider online publication (Biogeosciences, www.biogeosciences.net);
- Products for students: made available on CDs;
- Data management:
 - one stop cookbook for research projects;
 - educate about importance of data sets;
 - data policy: how to implement with “carrots”;
 - portal on metadata instead of all data.

Action: IPO to explore possibilities and cost for special issues.

Action: Mary-Elena to approach SOLAS to find out what is being done in terms of iron fertilization at this point and what is feasible.

Action: The IPO to open up the discussion with the whole SSC about the organization of a IMBIZO-2 and get more suggestions for topics from the other SSC members

Action: The IPO to build a timeline for all IMBER activities from June 2008 until June 2010.

7.2 **IMBER products**

Julie asked the SSC to start thinking about IMBER products for the future. Possible products:

- Data Management cookbook ;
- Scientific synthesis of long line data;
- Scientific papers (searchable under IMBER);
- IMBIZO special issues;
- Synthesis book, synthesis papers, special issues;
- Outreach products: Lectures on CDs, Pub. Articles, educational material, facts sheets, poster, brochures, IMBER update;
- Broadcast live;
- PDF copy of papers for IPO library.

7.3 **Endorsement**

The “Benefits of Recognition of IMBER Research” were re-written in a more attractive way.

- It is suggested to add on the “Letter of support” the possibility of endorsement if the project gets funded.
- It is proposed to contact the National contacts to promote endorsement;

- The endorsement committee is lacking one member. It is proposed to approach Carol Robinson.

Action: The SSC members are asked to read the “Benefits of Recognition of IMBER Research” and forward their comments and suggestions for changes to Sylvie. The IPO will post the new document on the website.

Action: Sylvie to approach Carol to become a member of the endorsement committee.

Action: The IPO to contact the National contacts to promote endorsement of projects.

Action: The IPO to write back to supported projects to offer endorsement.

7.4 Funding

Sylvie reviewed the global IMBER budget pointing at decisions to be made.

Requests for support	Decisions
IMBER Working groups	
SIC meeting October 08, France: 10 K USD	10 K USD
SIC! SOS Special volumes: 2 K USD	2 K USD
GO-SHIP-2 meeting, Jan-Feb 2009: 2.5 K USD	2.5 K USD
SOCAT-2 meeting, June 16-17, 2008: 2.5 K USD	2.5 K USD
Coastal CO ₂ meeting, Kiel Jan 2009: support for North American scientist	To reconsider at Exec
Workshop on ocean biogeochemical time-series, California, Nov 2008: any amount	No
End-to-end meeting, 2009: 5 K USD	5 K USD
Data Management: BEER workshop: 1.8 K USD	3 K USD
Regional projects	
ICED Workshop late 2008: 10 K USD	10 K USD
ICED SSC meeting late 2008: 5 K USD	5 K USD
SIBER Indian Ocean Program meeting, Bali May 2008: 2 K USD	No
Conference and meetings	
59 th Tuna Conference, California, May 2008	No
PICES Special session: 1 K USD	1.5 K USD
UK National IMBER workshop: 5 K USD	IPO support
GLOBEC OSC May 09, Canada: any amount	To reconsider at Exec
GODAE Annual meeting, Nice November 12-15 2008	Contact Niki to see if he will attend

IMBER support

IMBER benefits from a SCOR/NSF support of 50K for 2008 and part of 2009. IGBP is facing a financing problem and reduced our block grant of 7% this year. SCOR did allocate IMBER 7.5K for Developing country travel for the organization of the IMBIZO in Miami. The IPO, with the help of the IMBIZO organizing committee, also secured funds from EUR-OCEANS, University of Miami, and OCB in support for the IMBIZO. The IPO also secured funds from EUR-OCEANS for the Summer school that is organized in Ankara.

There is a clear need to find funds for the IMBER activities over the next years. Sylvie presented a list of potential funding sources and asks the help from the SCC to extend this list. The list of potential sources and suggested sources (USD) is:

Brittany Region

- Workshop organization (max. 4 K€)
- IUEM/UBO (2K)
- CNRS Summer school (20K)

European Science Foundation

- ESF Research Conferences (depends on partners)
- ESF Exploratory Workshop (max. 15 K €) (for IMBIZO 2010?)
- COST Actions (100 K €/year; 4 years)

USA collaborations

- OCB Workshop (20 K)
- NSF
- SCOR developing country travel funds
- CAMEO

Asian Pacific Network:

- **ARCP** (Regional Global Change Programme)
- **CAPaBLE** (Capacity Building) (max. 35 K): focus on global change

NATO: ARW, ANW, ATC: need matching funds

Action: IPO to explore further the COST action option.

7.5 SSC Rotation & New Member

The suggestion of SSC membership will be sent to SCOR and IGBP by the end of August for approval.

Action: All members to send Julie a list of names with country and expertise for potential SSC members

Action: Sylvie to send IGBP and SCOR the suggestions for SSC rotation by the end of August.

7.6 Next Executive Meeting

The next executive Meeting will be held in Miami (November 7-8, 2008).

Action: IPO to organise the next Exec meeting.

7.7 Next SSC Meeting

It is suggested to hold the next SSC Meeting in Brest.