

## **6.0 RELATIONS WITH INTERGOVERNMENTAL ORGANIZATIONS**

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## 6.0 RELATIONS WITH INTERGOVERNMENTAL ORGANIZATIONS

### 6.1 Intergovernmental Oceanographic Commission (IOC) *D'Adamo, Burkill*

SCOR and IOC co-sponsor the Global Ecology and Oceanography of Harmful Algal Blooms (GEOHAB) project (see Tab 3.1) and the International Ocean Carbon Coordination Project (IOCCP) (see Tab 4.1). IOC co-sponsored the Third Symposium on the Ocean in a High-CO<sub>2</sub> World (see Tab 4.2) and are co-sponsoring the 50<sup>th</sup> Anniversary Symposium on the International Indian Ocean Expedition (IIOE).

Peter Burkill and Ed Urban attended the IOC General Assembly in late June/early July 2013 to represent SCOR and ICSU. SCOR made one intervention during the meeting, in relation to the agenda item on the 50<sup>th</sup> anniversary celebration for the International Indian Ocean Expedition.

Thank you Mr Chairman.

SCOR, the Scientific Committee on Oceanic Research, welcomes the opportunity to cooperate with IOC on this important initiative in the Indian Ocean.

SCOR and IOC share a long history of effective cooperation ever since both organisations were formed within a few years of each other in the middle of the last century.

During the period 1959 to 1965, SCOR worked with IOC to bring about the International Indian Ocean Expedition (IIOE).

This expedition was the first time the countries of the world worked together to understand the natural dynamics and resources of this complex ocean.

Although great progress was made in IIOE and in subsequent studies in understanding the Indian Ocean, many aspects of this ocean remain poorly understood. Today the Indian Ocean remains understudied while our technical capabilities have advanced considerably in fields such as remote sensing, shipboard observations and ocean modelling.

SCOR would welcome working with IOC and with other organisations to improve our scientific understanding of this ocean and, in so doing, bring societal benefits to the large number of countries surrounding the Indian Ocean.

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The Intergovernmental Panel on Harmful Algal Blooms (IPHAB) proposed recommendations, adopted by the IOC General Assembly, inviting “SCOR to co-sponsor the Scientific Steering Committee for Global HAB and encourages active joint participation in the development and implementation of the science agenda”. GlobalHAB is a project being proposed to follow GEOHAB. The SCOR Executive Committee will discuss this invitation at its November

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meeting.

Burkill and Urban met with the French SCOR Committee and with the ICSU Executive Director, Steven Wilson, during the IOC meeting. Urban met with the UK SCOR Committee (Burkill is a member) in London following the IOC meeting.

### IOC report for SCOR 2013

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#### Ocean acidification

Efforts of IOC on ocean acidification include advocacy and communication, and promotion of research and oriented actions towards capacity building.

Regarding advocacy and communication, one of IOC-UNESCO missions is to enhance the sensitivity for OA not only among scientist, but also to the public, the stakeholders and the decision makers. A few examples include:

- (i) The IOC-SCOR-IGBP 3rd International Symposium on the Ocean in a High-CO<sub>2</sub> World, (Monterey, September 2012), was attended by a total of 529 scientists from 34 countries. They presented new information about the ability and inability of organisms at different trophic levels to cope with decreasing pH levels. The conference clearly emphasized the need for combining the stressor CO<sub>2</sub> with other factors such as temperature, nutrient availability and hypoxia. Preliminary studies revealed that rising temperature and CO<sub>2</sub> levels can have positive effects (Arctic phytoplankton (diatoms)) or affect species antagonistically (seagrass). Mesocosm<sup>1</sup> experiments obtained shifts in community composition, reduced diversity, as well as direct and indirect CO<sub>2</sub> effects within the water column and sediments.
- (ii) An Ocean Acidification summary for policy makers, coordinated by the IGBP and the IOC, is under preparation following the IOC-SCOR-IGBP Symposium Ocean in a high CO<sub>2</sub> World. The information in the summary will identify advances and significant findings in our understanding of ocean acidification.
- (iii) Further the IOC-UNESCO supports the Ocean Acidification International Coordination Centre, operated by the IAEA Marine Environmental Studies Laboratory in Monaco. The Centre will be overseen by an Advisory Board consisting of leading institutions, including the IOC of UNESCO.

With respect to the promotion of research and oriented actions towards capacity building, the IOC has developed the following activities in 2012-2013:

- (i) IOC is running since 2012 a project on Ocean Carbon Sources and Sinks, which includes biogeochemical time series, ocean carbon and blue carbon. Related to that, the IOC, and IOCCP are working on a new compilation of existing biogeochemical time series. In total, 125 biogeochemical time series have been compiled from around the world, which could be the embryo for a monitoring network for standardized ship based measurements of ocean acidification.
- (ii) The IOC has launched in 2012, together with NOAA and other organizations, the Global Ocean Acidification Observing Network (GOA-ON), which aspires to provide a central source of

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<sup>1</sup> **Aquatic mesocosms** are experimental water enclosures which are designed to provide a limited body of water with close to natural conditions, in which environmental factors can be realistically manipulated (mesocosm.eu).

- information and data exchange for ocean scientists on research activities in this area and to effectively monitor OA in coastal waters and high seas. Last meeting was held in St Andrews (Scotland) in July 2013.
- (iii) Finally we also develop our own research on OA and biodiversity. In this regard IOC is leading the Trans-boundary Water Assessment, which will assess the impact of ocean acidification on biodiversity using Pteropods (sea butterflies) as a case study. This research will demonstrate the potential of the Ocean Biogeographic Information System (OBIS) database, now part of IOC, as a key tool for research, knowledge generation and capacity building.

### **Nutrient's coastal Impacts research**

Together with UNEP, FAO, UN-Habitat and UNDP, the IOC-UNESCO has started a new GEF funded project on 'Global Foundations for Reducing Nutrient Enrichment and Oxygen Depletion from Land-based Pollution in Support of Global Nutrient Cycle'. Through this partnership project we would like to help ensure Blue Oceans and Green Fields.

The project will provide the foundations (including partnerships, information, tools and policy mechanisms) for governments and other stakeholders to initiate comprehensive, effective and sustained programs addressing nutrient over-enrichment and oxygen depletion from land based pollution of coastal waters

The deliverables include:

- (i) Development and application of quantitative modeling approaches to estimate and map sources and contributions of different nutrient sources to coastal nutrient loading and their effects; to indicate when nutrient over-enrichment problem areas are likely to occur; and to estimate the magnitude of expected effects of further nutrient loading on coastal systems under a range of scenarios.
- (ii) Development of a "Policy Toolbox", through which the decision-makers will have informed and interactive access, to cost effective, replicable tools and approaches to develop and implement nutrient reduction strategies

Execution of pilot projects in the Manila Bay watershed, Philippines and the Chilka Lake in India.

### **Microplastics**

Efforts of IOC on microplastics include advocacy and communication as well as promotion of research and scientific assessment.

In terms of advocacy the IOC is working with several foundations and civil society organizations such as the MOAF (Multi One Attitude Foundation), FNOB (Fundacion Navegacion Oceanica Barcelona), TARA and film makers to create awareness on the impacts of plastics and microplastics in the ocean, its marine organisms and ecosystems. Side events are being held in parallel to, for example, the IOC Assembly and the UNESCO General Conference.

Regarding the promotion of research and scientific assessment, the IOC is leading a the GESAMP WG40: *Sources, fate and effects of micro-plastics in the marine environment – a global assessment*, tasked to conduct a global assessment of the inputs, levels, distribution and fate of

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micro-plastics in the ocean, and the potential role of micro-plastics as a pathway for persistent, bio-accumulating and toxic substances entering marine food-webs.

### **Regular Process – WOA**

The task of the first cycle of the Regular Process (2010 to 2014) will be to produce the first World Ocean Assessment. Following the adoption in 2012 of the Terms of Reference and Methods of Work for the Group of Experts as well as the Outline of the First Global Integrated Marine Assessment (World Ocean Assessment, WOA-I), a number of activities have taken place and are briefly described in this document.

From September 2011 to February 2013, a number of regular process regional workshops have been organized under the auspice of the United Nations in Australia, Mozambique, USA, Belgium, China and Chile.

The Regular Process through various meetings of this Ad Hoc Working Group has expressed the need to start building capacity of Member States for the conduct of integrated marine assessments as a key priority. Recommendations identified during the Regular Process Regional Workshops are extremely useful in identifying regional priorities where targeted capacity-development interventions should be implemented.

IOC and UNEP stated that a practical approach for addressing capacities needs as identified through the regional workshops, would require the development of a tailored approach, such as the development and implementation of a specific Regular Process Training Module which would provide:

- (i) common information content/common approaches towards assessment methodologies;
- (ii) defining approaches for scaling up assessments (national, regional, global);
- (iii) promote the use of standardized procedure to integrate the ecological and socio-economic dimensions of assessments, with the aim of securing coherence, consistency and comparability across regions.

In the coming months, IOC, UNEP, DOALOS as Secretariat of the Regular Process, as well as the Bureau of the Ad Hoc Working Group will continue to discuss these options.

### **TWAP**

The Transboundary Waters Assessment (TWA) Programme Full Size Project by the Global Environment Facility (GEF) was approved in December 2012 and the time frame is 24 months, January 2013 – December 2014. UNEP's Division of Environmental Policy and Implementation (DEPI) is the implementing agency of TWAP FSP. The partners are UNEP's Division of Early Warning and Assessment (DEWA) as the main executing agency coordinating the work of UNESCO-IHP, ILEC, UNEP-DHI and the IOC-UNESCO.

The project is aimed to produce the first truly global assessment of all transboundary waters within the five recognized categories: transboundary aquifers and SIDS groundwater; transboundary lakes and reservoirs; transboundary rivers; Large Marine Ecosystems and the Open Ocean, and at

the same time formalize the network of partners to establish a firm institutional basis on which to base future periodic global assessments of transboundary waters. The project also aims to assist the GEF and other international organizations in improved priority setting for funding by providing a baseline and priorities for intervention. It is anticipated that this baseline will serve to assist international funding agencies in tracking the impacts of their interventions in terms of changes in state of the aquatic environments under consideration.

The Large Marine Ecosystems (LME) and Open Ocean (OO) Components held a joint Inception Workshop at IOC/UNESCO Headquarters in Paris from 20 -22 March 2013.

### **OBIS**

As part of the legacy of CoML, OBIS was adopted and is now fully operational as part of UNESCO/IOC under its IODE programme. The new OBIS project manager, Mr Ward Appeltans, was recruited in May 2012 and is based at the IOC project office of IODE in Oostende (Belgium). Mr Appeltans was managing the World Register of Marine Species (WoRMS) database before moving to OBIS. OBIS is governed by a steering group composed of the OBIS node managers. Currently, the data providers network consists of 15 operational OBIS nodes, which are regularly harvested by the central OBIS node. The central database servers are based in Oostende. New data continue to flow to OBIS. It now provides 32.7 million distribution records of 118,937 valid marine species (approximately half of all currently described marine species), from 1,072 datasets.

Being the largest global source of information on marine species distributions, OBIS serves new research and policy making at local and international level. Not less than 23 scientific publications that refer to OBIS are published between January-July 2012 (traced by Google Scholar). Fifteen of these also used OBIS data in their analyses. OBIS is explicitly mentioned in the list of recommended data sources in the decisions report of the tenth meeting of the Conference of the Parties (COP 10) in Nagoya (October 2010). In response to this, OBIS is providing data for the scientific preparation in support of a series of regional workshops being convened by the CBD Secretariat for the identification of Ecologically or Biologically Significant Areas (EBSAs) in open oceans and deep seas, which is one important step in the protection and preservation of marine biological diversity in Areas Beyond National Jurisdiction (ABNJ).



International Council for the Exploration of the Sea (ICES)  
Report to the 2013 SCOR Annual Meeting

submitted by the ICES Secretariat

The focus of activities in ICES 2013 lies on the development of a new (Strategic) Science Plan and on moving towards integrated ecosystem assessments.

**The new ICES Science Plan**

ICES currently develops a new Strategic Plan for the organization which will be supplemented by individual plans for science, the advisory service, the data centre and the secretariat. The new plan will be released in and run from 2014. There will be several overarching goals for all these “ICES pillars” with individual activities to be carried out to work towards these goals.

**Integrated ecosystem assessments and the ecosystem overviews**

ICES has a programme that is developing methods for integrated ecosystem assessments. These are regionally based -Baltic Sea, North Sea, NW Atlantic (USA & Canada), western European continental shelf and the Norwegian Sea. This allows for the consideration of regional priorities, but they combine every other year in a “benchmarking process” to review progress, look for commonalities and apply best international practice. The programme is primarily concerned with looking at tools to integrate ecosystem advice, test scenarios and evaluate management plans and explore the utility of indicators for management. The role of societal priorities’ is being considered by most groups with scoping for management objects and needs being acknowledged as part of an iterative and participatory process. All groups also advise on monitoring needs and have model development at their core.

While the Integrated Ecosystem Assessment work is designed to bring forward methods and tools, there is a parallel initiative in ICES to provide operational advice “overviews” for each region. These “Ecosystem Overviews” are being designed to embed the current ICES advice in the context of a changing marine ecosystem that has multiple anthropogenic impacts. Parts of the overviews relate to what could be considered traditional ICES interest areas (e.g. ecosystem

change, impacts of fishing, trophic interactions) but to provide true ecosystem advice, ICES needs to consider other multiple drivers and anthropogenic pressures. For this ICES must work with partners with complementary expertise and experience. The proposed structure of the overviews will highlight what are thought to be the main drivers on the system, and list the primary activities and pressures and then describe the state of the system in relation to the descriptors of good environmental status. They are being produced using criteria to judge whether to include information and ensure prioritisation of impacts within the advice. The overviews will require the formal building of structures for the operational delivery of data. There are many partner organisations and/or members of the ICES community that are ready to provide oceanographic, chemical biological or human pressure information in a regular operational manner.

All of this work on developing integrated ecosystem assessments and providing regional ecosystem overviews hangs on the concept of providing robust indications for the state of the ecosystem. ICES has much expertise and experience in the development, assessment and use of indicators for management of the marine exploited living resources which it is now applying to other evidence based policy areas.

### Science Symposia

In 2013, ICES has co-sponsored the following science symposia:

YEAR	DATE AND VENUE	SYMPOSIUM	CONVENERS
2013	8–12 April 2013, Viña del Mar, Chile	7th International Fisheries Observer and Monitoring Conference (7th IFOMC)	Oscar Guzman (Chile)
2013	5–8 May 2013, Algarve, Portugal	Symposium on “Pollution Responses on Marine Organisms”	Maria Bebianno, Lucia Guilhermino, Leonor Cancela (Portugal), and Matthew Gubbins (UK)
2013	6–8 May 2013, Bergen, Norway	Conference on “Acidification of the Arctic Ocean and Northern Seas: Trends and Consequences”	Arctic Council’s Arctic Monitoring and Assessment Programme (AMAP) and ICES
2013	15–19 July 2013, Boston, USA	The World Conference on Stock Assessment Methods for Sustainable Fisheries	Steve Cadrin (USA), Mark Dickey-Collas (the Netherlands) and Rick Methot (USA)
2013	15–18 October 2013, St. Andrews, Canada	Symposium on “Gadoid Fisheries: the Ecology and Management of Rebuilding”	Edward Trippel (Canada) and Fritz Köster, Denmark

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For 2014, ICES envisages to support five science symposia:

YEAR	DATE AND VENUE	SYMPOSIUM	CONVENERS
2014	3–6 March 2014, FAO Head-quarters, Rome, Italy	Symposium on “Making the Most of Fisheries Dependent Data: Science, Management, and Policy-making with the Active Participation of Stakeholders”	Norman Graham (Ireland) Gabriella Bianchi & Kwame Koranteng (FAO) William Karp & Kimberly Murray (USA) Hendrik Doerner & Jann Martinsohn (European Commission - Joint Research Centre) Aasmund Bjordal (Norway) Marco Frederiksen (Denmark) Steve Kennelly (Australia) Martin Pastoors (Netherlands)
2014	16-19 June 2014, Tromsø, Norway	Symposium on “Effects of fishing on benthic fauna and habitat: Change in ecosystem composition and functioning in response to fishing intensity, gear type and discard”	Lene Buhl-Mortensen, Carsten Hvingel and Børge Holte (Norway), Francis Neat (Scotland) and Mariano Koen-Alonso (Canada)
2014	2-4 June 2014, Porvoo, Finland	ICES/PICES Symposium on “Ecological basis of risk analysis for marine ecosystems”	Sakari Kuikka (Finland), Tony Smith (Australia) and Alexei Orlov (PICES)
2014	October 2014, Palma, Mallorca Island, Spain	5th International Otolith Symposium 2014 (IOS2014)	Beatriz Morales-Nin (Spain) and Audrey Geffen (Norway)
2014	7-9 October 2014, Bergen, Norway	Johan Hjort Symposium on Recruitment Dynamics and Stock Variability	Svein Sundby (Norway), Olav Sigurd Kjesbu (Norway), and C. Tara Marshall (Scotland)

### The ICES Training Programme

In 2013, ICES offers nine courses on various topics, including stock assessment and fisheries management, ecosystem surveys and modelling, VMS and logbook data, and geostatistics.

### 6.3 Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP)

*Duce*

#### Report on the Activities of GESAMP Working Group 38

SCOR, NSF, WMO, and IMO have supported GESAMP WG 38 (Atmospheric Input of Chemicals to the Ocean) during the past year. In particular, during the 39<sup>th</sup> meeting of GESAMP at the United Nations in New York, additional terms of reference for continued work of GESAMP WG 38 were approved to address issues related to the impact of the atmospheric deposition of anthropogenic nitrogen to the ocean. These additional tasks were added as follows:

1. Update the geographical estimates of anthropogenic nitrogen deposition to the global ocean made in the 2008 paper in *Science* (Duce, R.A., et al., "Impacts of atmospheric anthropogenic nitrogen on the open ocean", *Science*, 320, 893-897 (2008), which were based on data from 2005 or earlier. This would utilize newer and more geographically distributed data on anthropogenic atmospheric nitrogen concentrations and deposition over the global ocean as well as improved models of these processes and impacts.
2. Considering issues related to Task 1 above, re-evaluate the impact of atmospheric nitrogen deposition on marine biogeochemistry, including re-estimating the amount of CO<sub>2</sub> that could be drawn down from the atmosphere into the ocean as a result of the increased productivity in the ocean derived from the additional anthropogenic nutrient nitrogen deposited. This would allow an update on the impact of the atmospheric nitrogen deposition on atmospheric radiative properties outlined in the 2008 *Science* paper.
3. Provide a more reliable estimate of the impact of atmospheric anthropogenic nitrogen deposition on the production of additional nitrous oxide in the ocean and its subsequent emission to the atmosphere. This was one of the greatest uncertainties in the 2008 *Science* paper.
4. Evaluate the extent to which anthropogenic nitrogen delivered to the coastal zone via rivers, atmospheric deposition, etc. is transported to the open ocean, in which regions this may happen, and what its impact is there. In the 2008 *Science* paper it was assumed that all nitrogen delivered to the coastal zone was sequestered there and did not reach the open ocean, but this may not be true in all locations.
5. Make a more detailed estimate of the input and impact of anthropogenic nitrogen in the area of the Northern Indian Ocean (Arabian Sea, Bay of Bengal) and the South China Sea - the areas that are expected to show the greatest increase of anthropogenic nitrogen deposition over the next few decades.

To address these terms of reference a workshop on The Atmospheric Deposition of Nitrogen and Its Impact on Marine Biogeochemistry was held at the University of East Anglia in Norwich, United Kingdom, from 11 to 14 February 2013. The first day of the workshop was devoted to discussions of the five tasks identified above as the foci of the workshop. Two individuals were asked to summarize the issues in each of these task areas and to lead the discussions that

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followed. On the basis of the task area discussions above, the workshop individuals broke up into sub-groups on the second through fourth days of the workshop. These sub-groups began the development of nine different scientific papers, covering the task areas above, which will be (or have been) submitted to peer-reviewed journals. Twenty-three scientists participated in the workshop, one participating by Skype. This was a highly successful workshop.

The approximate titles of these nine papers are as follows:

- A) Impact of atmospheric nitrogen deposition on the oceans
- B) Atmospheric nitrogen deposition to the oceans: observations vs model-based estimates
- C) Atmospheric nitrogen deposition to the South China Sea
- D) Modeling the ocean biogeochemical response to increasing nitrogen deposition
- E) Riverine delivery of nutrients and carbon to the oceans
- F) Marine nitrogen cycle - overview and update
- G) Future changes in N<sub>2</sub>O emissions from the Arabian Sea and Bay of Bengal: the role of increasing atmospheric and riverine inputs
- H) Sensitivity of the marine nitrogen inventory to regional nitrogen deposition
- I) Model grid resolution influence on the simulation of marine biogeochemistry

These papers are now in the process of being developed (one has been submitted for publication) and most should be completed within the next several months, with all being submitted for publication from the fall of 2013 to the summer of 2014.

As far as future activities of WG 38 in 2014 are concerned, we believe that the WG should simply focus on getting all of these papers completed and submitted, and hopefully published over the next year. Thus right now we are suggesting that there be no additional tasks undertaken, except for a special session at the EGU meeting in Vienna in the spring of 2014. We have proposed a session there entitled “Atmospheric Deposition to the Ocean: Impacts on Marine Biogeochemistry and Climate.” Results from many of the papers listed above will be presented at this session. We would also like to use the time over the next year to consider if there are any additional issues related to the input of chemicals to the ocean that WMO and other sponsors might be interested in the working group addressing.

**6.4 North Pacific Marine Science Organization (PICES)**

*Batchelder, Taguchi*

Report will be available after the annual PICES meeting in October.