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Report of the Working Group on Large Marine Ecosystem Program Best Practices (WGLMEBP)

12–13 July 2011

Paris, France

ICES International Council for the Exploration of the Sea

CIEM Conseil International pour l'Exploration de la Mer

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Executive Summary

The second meeting of the ICES Working Group on Large Marine Ecosystems Best Practices (WGLMEBP), co-chaired by Michael O'Toole and Jan Thulin, was held at the IOC/UNESCO headquarters in Paris on 12–13 July 2011. It was attended by 25 members representing senior scientists and project managers from several Large Marine Ecosystems (LMEs) in Africa, Asia, Latin America and northern Europe, ICES, IOC, NOAA, FAO, GEF:IW LEARN and a number of international institutions from the USA, Norway, Sweden, Ireland, UK and Germany. The WGLMEBP meeting was held in conjunction with the 13th Annual Consultative Committee on Large Marine Ecosystems.

One of the main objectives of the Working Group meeting was to review the current training and capacity building needs of LME projects and how ICES could best address these through scientific support, advice and expertise from its extensive experience in coordination of marine science in the North Atlantic. The Working Group noted the ongoing training activities provided by ICES.

The Working Group noted that specific training courses were also provided by IOC, FAO (including the Nansen EAF project), ODIN-Africa, IODE, the International Ocean Institute (IOI), and various other institutions and universities.

The Working Group recognized the need for an institution to coordinate and integrate the training requirements of the LME projects and their community of practice. It also discussed the potential of ICES as an institution for coordination and provision of ecosystem-based training and assessments as well as integrated coastal management (ICM) for LME projects worldwide.

The challenges facing the LME management in terms of maintaining high standards in marine science, training and capacity building as well as information sharing and outreach were discussed and how best ICES could link with LMEs in terms of providing advanced training in targeted areas of research and management.

Key priority training and capacity building needs of some LMEs were identified including integrated ecosystem assessments, coastal zone management, adaptation to climate change in coastal and marine ecosystems, marine socio-economics and value of goods and services, and development of decision support tools for LME assessments and management.

A summary of some best practices from selected LME projects were presented which included the development and successful use of the Transboundary Diagnostic Analysis (TDA) and Strategic Action Programme (SAP) methodology, a coordinated approach to information sharing and outreach and putting in place structures to address overfishing, decline catches, pollution and habitat loss including formation of regional Commissions and Alliance partnerships.

A preliminary assessment of the numbers of LME practitioners indicate that there are over 10 000 individuals with various backgrounds and qualifications that have a wide range of training needs including on-the- job training, distance learning and information sharing and participation in research cruises. Further clarifications are needed on what constitutes an LME Practitioner.

The integrated ecosystem assessment of the Baltic Sea Areas (WGIAB: ICES CRR 302) can provide useful lessons for LMEs including the development of indicators to support ecosystem based fisheries advice and management.

ICES should consider partnership in the GEF LME/ICM CoP project particularly in component 3 which addresses capacity and partnership building through twinning and learning, exchanges, workshops, education and training.

The Working Group proposed ICES as the coordinating institution for the large scale ecosystem-based training and for providing advanced courses for senior marine scientists. This was identified as an urgent need along with ICES partnership with the IW GEF LME/ICM CoP Project.

1 Welcoming and opening of meeting

The second meeting of the ICES Working Group on Large Marine Ecosystems Best Practices (WGLMEBP), co-chaired by Michael O'Toole and Jan Thulin and hosted by the Intergovernmental Oceanographic Commission (IOC) at the IOC/UNESCO Headquarters in Paris, was linked with the 13th Consultative Committee Meeting on Large Marine Ecosystems on 12 and 13 July (see agenda in Annex 4b). Many of the LME consultative committee members also attended the Working Group meeting. A draft resolution of the WGLMEBP 2011, the 2010 Terms of Reference and the list of participants are given in Annexes 1, 2 and 3 respectively.

Jan Thulin (Co-Chair) welcomed all the participants and summarized the objectives of the WGLMEBP and its terms of reference and provided a brief introduction to the agenda (Annex 4a). The Co-Chair acknowledged the progress made since the last meeting of the Global Environment Facility (GEF) LME Community of Practice (CoP) project by IW:LEARN and confirmed the interest of ICES in participation and partnership especially in the area of coordination of training and capacity building for LME in marine science and providing advanced courses in ecosystem based management and integrated assessments.

Although it was not possible to address all the term of reference, i.e. the selection and use of science based indicators for adaptive ecosystem-based management in LMEs, considerable progress was made on the assessment of training and capacity building needs of LMEs and in examining some of the issues outlined in the 2010 ICES WGLMEBP Report. The Co-Chair called for further discussions on the ICES / LME linkages especially in relation to the GEF CoP project particularly with regard to coordination and the provision of specialized training courses and expert advice through its many scientific working groups.

2 Background

Michael O'Toole (Co-Chair) provided an overview of the WGLMEBP 2010 Report stating that a number of the recommendations outlined in the document had been addressed.

A special Thematic Session on the assessment and management of Large Marine Ecosystems has been arranged for the 2011 Annual Science Conference of ICES to be held in Gdansk, Poland on 20 September 2011. The session will consist of 18 papers and five posters presented by international marine researchers and LME practitioners including representatives from ICES countries (see Annex 5). The meeting will afford a valuable opportunity for regional coordinators of LME projects and ICES scientists to meet, exchange ideas and lessons learned and build networks that can be of mutual benefit, particularly in the area of training and capacity building and ensuring high quality of scientific research. A table was prepared for discussion which outlined what ICES and the LME community could offer each other (Annex 6).

An assessment of key priority training and capacity building needs of some LMEs were presented as well as what ICES could address in terms of specialized courses to support ecosystem based management and integrated assessments (Annex 7). Training courses identified as of particular importance by LMEs include integrated ecosystem assessments; coastal zone management and marine spatial planning; adaptation to climate change in coastal and marine ecosystems; marine socio-economics and

value of goods and services; and development of decision support tools for LME assessments and management.

In terms of meeting the training and capacity building needs of the LMEs, it was noted that ICES provided several intensive international courses each year (4–5 days duration with 20–25 participants) which focused inter alia on advanced training in ecosystem based management, integrated ecosystem assessments, ecosystem modelling for fisheries, communicating the science to managers and on climate impacts on marine ecosystems. Many of these ICES courses are designed for advanced training that also cover cutting edge marine ecosystems and fisheries science issues and adaptive management strategies.

Other initiatives such as on the job training and courses are also provided by a number of agencies e.g. IOC, FAO (including Nansen EAF project) and IOI in thematic areas such as fish stock assessment, EAF, harmful algal blooms (HABs), operational oceanography, ecosystem modelling and ocean governance.

A brief summary of some best practices emerging from a few selected LME projects was also presented and are listed in Annex 8. These include the development and successful use of the Transboundary Diagnostic Analysis (TDA) and Strategic Action Programme (SAP) methodology for project implementation, coordinated dissemination of information and outreach i.e. websites, newsletters and DVDs and the development of National Action Plans (NAPs) for application of the ecosystem approach to management. Several LME's including the Benguela Current, Agulhas Somali Current, Guinea Current and Yellow Sea have put governance structures in place to address overfishing, decline catches, pollution and habitat loss including formation of regional Commissions and alliance partnerships.

A summary of the Global Environment Facility (GEF) draft proposal entitled "A Global Community of Practice to Improve the Management of Large Marine Ecosystems and their Coasts (LME/ICM-CoP) is given in Annex 10. This project is currently being prepared and is to be submitted to the GEF for funding. It has components that are of particular interest to ICES in terms of providing training, capacity building, learning exchanges and workshops The objective of the project is to generate knowledge, build capacity, harness public and private partners, support South to South learning and improve performance of International Waters projects through a Community of Practice for the sharing of ecosystem-based management approaches to Large Marine Ecosystems and their coasts and best practices.

3 Presentations

Anthony Grehan provided a presentation on the multi-country EU FP7 funded CoralFish project which is coordinated by NUI-Galway, Ireland, and is studying the interaction between cold water corals, fish and fisheries in the Celtic-Biscay Shelf LME. Using a ROV, new coral reef habitats were discovered in canyon systems and deepwater shelf areas off the west coast of Ireland. Investigations of the coral reefs, carbonate mounds and associated fisheries have provided valuable information to support the protection and conservation of these cold water coral ecosystems. The project has also developed tools to enable the implementation of ecosystem based management of deep water resources which is particularly relevant to the emerging European marine resource policy and the Marine Strategy Framework and Habitats Directives.

Ken Sherman's presentation on "Best Practices in TWAP for Large Marine Ecosystems Assessment and Management" highlighted the LME approach to ocean governance and sustainable development through the use of the modular approach of productivity, fish and fisheries, ecosystem health and pollution, socio-economics and governance. He pointed out that many scientific papers and published volumes have resulted from the GEF-funded LME projects worldwide, all of which focus efforts to reduce coastal pollution, restore damaged habitats, recover depleted fishery stocks, control coastal erosion and expedite marine spatial planning. He also drew attention to the GEF International Waters Operational Strategy which supports the new paradigm of movement towards ecosystem-based management and restoration of LMEs through development and implementation of a Transboundary Diagnostic Analysis (TDA) and Strategic Action Programme (SAP). He singled out a number of LME's including the Benguela Current and the Baltic Sea where the five modules underpinned by evident-based science were being used to manage the marine and coastal resources and the environment. He highlighted the Yellow Sea LME as a successful case study where the modular approach allowed flexibility in the way the countries can shape their own activities and move from science into management.

Adaptive ecosystem-based management strategies were also shown to have positive impacts on rebuilding herring, mackerel, yellow flounder and scallops fisheries along the US North East Shelf. Pollution and ecosystem health in LMEs were also discussed along with the threats to marine resources associated with eutrophication, anoxia, HABs and "dead zones". The socio-economic value of LMEs and associated goods and services was estimated at $12.6 trillion annually to the global economy. In terms of governance, a number of LMEs have already formed regional Commissions e.g. Benguela Current and Guinea Current which are implementing ecosystem based management policies based on adaptive strategies and evidence based marine scientific research and monitoring.

Clear evident was demonstrated on accelerated warming in 61 of the 63 LME assessments world-wide with some on the fastest warming LMEs being found in the Baltic Sea, the North Sea, the east China Sea and the Sea of Japan.

Marie-Christine Aquarone referred to the GEF-funded LME Community of Practice project presently being developed by IW:LEARN (UNDP) to provide education training and outreach to LME practitioners over the next five years. She summarized the numerous types of training opportunities available in many of the LMEs, particularly the hands-on training at sea aboard research vessels for students, young fisheries biologists and oceanographic researchers. She highlighted the Benguela Current, Agulhas Somali Current, Guinea Current and Canary Current LME's supported by the R.V. Dr Fridtjof Nansen as being very active in providing training of many students and researcher from the regions, gaining a wide variety of experience in marine scientific research and the assessment of marine resources.

Future LME curricula for basic training could be developed based on the five modules which could take advantage of distance learning information sharing tools, SKYPE, as well as shared opportunities aboard research vessels for training at sea. Courses could draw on the large amount of resources available for the world-wide LME network including the UNEP LME Report, the LME published volumes, socio-economic and governance handbook, the lessons learned in establishing the Benguela Current and Guinea Current Commissions as well as the success stories of the Baltic and Yellow Sea LMEs. Numerous hands-on and short intensive training courses have already been given in LME regions by FAO (including the Nansen EAF project), IOI,

IOC and various other institutions and universities i.e. UBC –Canada and UCT Mare in South Africa. These courses cover specific requirement by countries that cover fish stock assessment, modelling (Ecopath and Ecosim), HABs, trawl survey design, operational oceanography and EAF. The presentation concluded that there was a need to agree on the definition of an LME Practitioner and to accurately quantify the numbers throughout the global LME community.

A preliminary extrapolation from the Benguela Current, Agulhas Somali Current, Baltic Sea, Bay of Bengal, Canary Current, Carribbean, Guinea Current, Gulf of Mexico, Humboldt Current and Yellow Sea LMEs suggest that figures approach or exceed 10 000 operational practitioners. Further clarification is needed to be obtained on what defines an LME Practitioner.

Yvonne Walther provided a comprehensive overview of ongoing ICES's Baltic WG activities and specifically on the ICES/HELCOM Working Group on Integrated Assessments of the Baltic Sea (WGIAB). The overall tasks of this WG were to conduct holistic ecosystem assessments, develop ecosystem modelling in the assessment framework and develop adaptive management strategies for the different Baltic Sea ecosystems. A key component of the work centred on simulating fisheries scenarios using the biological ensemble modelling approach (BEMA) and linking models to climate, fish and food webs. Ecosystems investigated so far were the Kattegat, The Sound, Central Baltic Sea, Gulf of Riga, Gulf of Finland, Bothnian Sea, Bothnian Bay and as well as in two other coastal areas.

Ecosystem assessments included the analysis of a large number of variables (phytoplankton, zooplankton, zoobenthos, fish, birds and seal) and linking these ecological results to management. The development of indicators to support ecosystem-based fisheries advice and management is of major importance in implementing a knowledge based approach to adaptive management strategy for the Baltic Sea fisheries and ecosystems.

4 Discussions

The potential involvement of ICES as a partner in the GEF LME/ICM CoP project was discussed and considered as an opportunity to deliver specialized and coordinated training courses in advanced marine scientific research methodology, integrated assessments and ecosystem based management. This medium size proposal to improve the management of Large Marine Ecosystems and their coasts was presented to the 13th LME Consultative Committee meeting (which WGLMEBP members attended) and is currently being prepared for a project preparation grant request. The CoP proposal, which is seeking funded from the GEF of $US 4.0 million, calls for a training strategy to be implemented and 10 000 GEF LME/ICM practitioners trained in ecosystem-based techniques and approaches, including adaptation to climatic variability and change. The project's objective is to generate knowledge, build capacity, harness public and private partners, support South to South learning, and generally improve the performance of GEF International Waters projects through a Community of Practice for the sharing of ecosystem-based management approaches to Large Marine Ecosystems and their coasts, and best practices.

Discussions also centred on how best to meet the training and capacity building needs of the LME Community. A series of questions below formed the basis for those discussions.

- What can ICES do for the LME Community training and capacity building needs, particularly in relation to the GEF LME/ICM CoP project?
- How can ICES enhance the science capacity of LMEs to improve marine scientific research and management?
- Can ICES provide new opportunities, methodologies and working groups, specifically designed for LMEs?

The Working Group (WGLMEBP) recognized a worldwide need for the accelerated training of many thousands of LME practitioners in a number of key thematic areas including ecosystem-based management and assessments, integrated coastal management (ICM), climate change adaptation in coastal and marine ecosystems, marine socio-economics and the valuation of marine goods and services. This accelerated training would allow the ongoing LME Projects of Africa, Asia, Latin America, Eastern Europe and the Arctic to develop and implement ecosystem-based techniques and approaches to manage their marine resources while at the same time consider how best to adapt to the challenges of climate variability and change. Such training activities would make significant improvements in regional capacity to support integrated plans to reduce coastal pollution, restore damaged habitats, recover depleted fisheries, protect biodiversity, and generally manage their marine resources for long-term ecosystem sustainability. The training activities could be developed in several locations and at different levels, would address the needs of scientists, administrators, government representatives, resource and ecosystem managers, academic institutions, field technicians, and of private company representatives.

The Working Group recognized the need for an institution to coordinate and integrate the training requirements of the LME project community and LME movement. The members are convinced that ICES is the best institution to play a key role in this field, because of its wide range of activities, advanced marine expertise, and sound scientific advice. The extensive ICES network would provide access to cooperation and exchange amongst the Large Marine Ecosystem Projects. The Working Group discussed ICES as a possible coordinating partner for the large scale ecosystem-based training and for providing advanced courses for senior scientists from LME regions. This was identified as an urgent need along with ICES partnership with the IW GEF LME/ICM CoP Project. The IOC also expressed an interest in hosting training and capacity building courses at its Paris headquarters.

ICES is the oldest and most prestigious intergovernmental organization in the world concerned with marine and fisheries science. It is in a unique position to provide training and expert advice in the integrated assessment and management of marine ecosystems, particularly in shelf seas and related current systems. The institution has an established history of providing training courses, and has a multitude of working groups that open up opportunities for training on the job. The ICES training program is designed to help build capacity and support scientists involved in the advisory process and its specialized training courses are taught by high profile scientists and instructors. In addition ICES can provide further support to LMEs through their specialized working groups which focus on fish stock assessment, survey design, climate change and fisheries, marine spatial planning, ecosystem assessments, and ocean governance. ICES can also develop new working groups to address specific LME research and management issues and training needs.

The WGLMEBP noted that there is a real need:

i) to provide LME project personnel with information on ICES training facilities and capabilities;

ii) to develop an Action Plan for capacity- building based on the approved Working Group's Terms of Reference;

iii) to establish mechanisms within ICES that will maximize the training opportunities;

iv) to identify possible sources of funding, (including in-kind) in addition to seeking co-finance to partner with the CoP GEF project proposal;

v) to identify sources of support, both internal to ICES and from other marine science institutions, for CoP training;

vi) to make use of distance learning information sharing tools (D-LIST) and free technologies, such as SKYPE, for training purposes in developing countries, allowing for the training of higher numbers of people.

ICES draft Science Plan recognizes that, because of the emerging needs of advice on 'ecosystem considerations', a broader range of scientific expertise is required. As such, it needs to further engage the marine science community, including a wider range of experts from universities and diverse ministries in the member countries. The training initiative and requirements of the LME CoP represents a major opportunity for the enhancement of the ICES science capacity, the development of world partnerships and scientific alliances beyond the present ICES geographic scope, the delivery of science programs, and a way to link with the LME movement worldwide.

Some discussion was held on the definition of an LME practitioner and the need to agree on a specific description. At present, they are defined as persons whose intentional activity initiate or accelerate the recovery and sustainability of LME goods and services; persons engaged in the paradigm shift from a sector-by-sector approach to ecosystem-based management. LME Practitioners are seen as persons who use the GEF Transboundary Diagnostic Analysis (TDA) and Strategic Action Programme (SAP) methodology and the integrated 5-modular approach to the assessment and management of ocean productivity, fish and fisheries, pollution and ecosystem health, socioeconomics and governance.

5 Recommendations

1) It is recommended that the Working Group on Large Marine Ecosystem Programme Best Practice WGLMEBP meet in July 2012 at UNESCO HQ, Paris, France, back-to-back with and after the 14th LME Consultative Committee Meeting.

2) It is recommended that ICES considers a formal partnership in the developing GEF LME/ICM CoP project.

3) It is recommended that the chairs and members of the WGLMEBP in consultation with the ICES Secretariat intersessionally decide upon an Action Plan in relation to the CoP project.

4) It is recommended that ICES country delegates further secure national participation in the WGLMEBP, especially in consideration of the growing importance of the Arctic LMEs.

Annex 1: WGLMEBP draft resolution 2011

The **Working Group on Large Marine Ecosystem Programme Best Practice** (WGLMEBP), chaired by Michael O'Toole, Ireland, and Jan Thulin, ICES, will meet at UNESCO HQ, Paris, France, July 2012 back-to-back with and after the 14th LME Consultative Committee Meeting to:

a) Continue to identify best practices in the selection of science-based indicators for adaptive ecosystem-based management within the framework of the Large Marine Ecosystem (LME) projects;

b) Further evaluate and compare among LMEs the prescribed principal indicators used to index conditions in relation to resource recovery, climate change, and sustaining socio-economic benefits;

c) Report findings and methods of best practice in Community of Practice handbooks, publications and reports including those of the WGLMEBP. These will be made available to LME practitioners, the public and other interested parties in the developing and developed world;

d) Develop effective training modules consistent with effective implementation of best practices for ecosystem-based management at the LME scale;

e) Decide upon terms of reference that relate to a work plan for the next two years that complement the ICES Science Plan and the GEF LME/ICM CoP project.

WGLMEBP will report by 15 August 2012 (via SSGRSP) for the attention of SCICOM and ACOM.

Supporting information

Priority	Investments in LME programs in the developing and developed world require implementation plans that are effective and efficient. A critical review of LME principles and implementation success will lead to more effective LME programs resulting in measurable progress in ststaining marine and coastal ecosystems.
Scientific justification	What is presently lacking is a process to identify, review, and synthesize the best assessment and management practices among the community of LME practitioners facilitating the exchange of lessons learned. To date, no effort has been made to analyze and integrate the scientific findings from these projects and to disseminate them to regional and global partners. Additionally, there has been little opportunity to inform LME project scientists and managers about broader global ocean issues, emerging challenges, new methodologies and science and policy breakthroughs in shaping ecosystem-based management. A cross-system comparative analysis would be useful in strengthening the scientific capacity of countries for adaptive ecosystem-based management. The LME projects have reached a level of experience and practice where it is beneficial and cost effective to share experiences, information, technological improvements, measurable benefits, and effective practices and lessons, and direct the information to all project participants. It is critical to provide adaptive management stategies that reflect changing circumstances, in view of the accelerating effects of climate change on marine ecosystems. It is especially important during this economic downturn to maximize available and pertinent LME information in a cost effective way. Given the emphasis on science supporting EBM in the ICES Science Plan, using the past and present LME program outcomes to

	inform future national and international programs is prudent.
Resource requirements	The LME programs being reviewed by this Working Group are already underway and information necessary for the Working Group to function has already been made available. It is envisioned that LME practioners and selected independent scientists will assist conducting a critical review of best practices in science and governance of LMEs.
Participants	The Group will be attended by some 20–25 members and invited scientists.
Secretariat facilities	Meeting room, report preparation and dissemination
Financial	No financial implications.
Linkages to advisory committees	There are no obvious direct linkages with the Advisory Committee.
Linkages to other committees or groups	There is a very close working relationship with a number of the working groups under the SCICOM Steering Group on Regional Seas and others
Linkages to other organizations	The establishment of this Working Group will inform and is endorsed by the Intergovernmental Oceanographic Commission (IOC), Food and Agricultural Organization (FAO), the United Nationa Environment Program (UNEP), and the Global Environmental Facility (GEF).

Additional Background

1. Introduction

Overfishing, marine pollution, habitat loss and climate change are contributing to the degradation in the world's marine ecosystems. The net economic benefits provided by coastal oceans are declining even as the coasts become more populated and large segments of the population more dependent on coastal fisheries as their main source of protein. Prompt and large scale changes in the use of ocean resources are needed to overcome the negative consequences of human exploitation.

Beginning in 1995, the Global Environment Facility (GEF) has been providing financial support to developing countries committed to the recovery and sustainability of large marine ecosystems (LMEs) off their coasts. A useful tool in the GEFs arsenal has been a modular indicator-based approach to the assessment and management of LMEs. The comprehensive approach to GEF-funded LME projects has focused on measures of changes in LMEs for (i) productivity, (ii) fish and fisheries, (iii) pollution and ecosystem conditition, (iv) socioeconomics, all enabled through (v) governance. Ecosystem measurements for the first three provide a basis for scientific input into policy and management discussions leading to socioeconomic benefits and mutually agreeable and hopefully effective marine governance regimes. The GEF has provided support for ecosystem projects in one hundred and ten countries (more than half the countries of the globe) in Africa, Asia, Latin America and Eastern Europe to identify root causes of marine ecosystem deterioration and provide guidance for recovery should best management practices be implemented. LME projects in the Benguela Current, Yellow Sea, Guinea Current, Baltic Sea and Agulhas and Somali Currents, are joint initiatives funded by the GEF, the World Bank, and the governments of the participating countries adjacent to the LME. The results of the LME programs in these areas are working toward the management and utilization of the LME resources in a sustainable and integrated manner. The applied and pragmatic LME approach uses 1) science based assessments of LME productivity, fish and fisheries, pollution and ecosystem condition, and (2) linking the science based assessments of the changing states of LMEs to management actions for recovering depleted fisheries, restoring critical habitats assesses and managing large ocean areas for sustained biological productivity.

2. Issue to be addressed

What is presently lacking is a process to identify, review, and synthesize the best assessment and management practices among the community of LME practitioners facilitating the exchange of lessons learned. To date, no effort has been made to analyze and integrate the scientific findings from these projects and to disseminate them to regional and global partners. Additionally, there has been little opportunity to inform LME project scientists and managers about broader global ocean issues, emerging challenges, new methodologies and science and policy breakthroughs in shaping ecosystem-based management. A cross-system comparative analysis would be useful in strengthening the scientific capacity of countries for adaptive ecosystem-based

management. The LME projects have reached a level of experience and practice where it is beneficial and cost effective to share experiences, information, technological improvements, measurable benefits, and effective practices and lessons, and direct the information to all project participants. It is critical to provide adaptive management stategies that reflect changing circumstances, in view of the accelerating effects of climate change on marine ecosystems. It is especially important during this economic downturn to maximize available and pertinent LME information in a cost effective way. Given the emphasis on science supporting EBM in the ICES Science Plan, using the past and present LME program outcomes to inform future national and international programs is prudent.

Establishment of a new ICES Large Marine Ecosystem Community of Practice Working Group (WG-LME)

The objective of the working group would be the sharing of information (e.g., data, lessons learned and best managment practices) developed through the LME project process among the the global marine science community.

ICES has a long and successful history in the coordination and promotion of marine research in oceanography, the marine environment, marine ecosystems, and living marine resources in the North Atlantic. This Working Group would utilize the extensive ICES scientific network to gather additional information about marine ecosystems, filling gaps in existing knowledge and providing information and unbiased, non-political advice as it related to LMEs around the world. Given the global nature of the GEF-funded LME work, it may be possible for ICES to enlist other international marine science organizations such as PICES and IOC in a joint working group setting, and this should be explored.

Annex 2: WGLMEBP Terms of Reference 2010

The **Working Group on Large Marine Ecosystem Programme Best Practices** (WGLMEBP), chaired by Michael O'Toole, Ireland, and Jan Thulin, ICES, will meet at UNESCO HQ, Paris, France, 12–13 July 2011 in conjunction with the 13th LME Consultative Committee Meeting to:

a) Continue to identify best practices in the selection of science-based indicators for adaptive ecosystem-based management within the framework of the Large Marine Ecosystem (LME) projects;
b) Further evaluate and compare among LMEs the prescribed principal indicators used to index conditions in relation to resource recovery, climate change, and sustaining socioeconomic benefits;
c) Report findings and methods of best practice in Community of Practice handbooks, publications and reports, including those of the WGLMEBP. These will be made available to LME practitioners, the public and other interested parties in the developing and developed world;
d) Develop effective training modules consistent with effective implementation of best practices for ecosystem-based management at the LME scale;
e) Decide upon terms of reference that relate to a work plan for the next two years that complement the ICES Science Plan.

WGLMEBP will report by 31 August 2011 (via SSGRSP) for the attention of SCICOM and ACOM.

Annex 3: List of participants

WGLMEBP 2011 meeting, Paris, France, 12–13 July 2011

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Annex 4a: Agenda 2nd Working Group Meeting of Large Marine Ecosystems Best Practice (WGLMEBP)

Tuesday, 13 July 2011

13h:30 – 13h:45 Welcome and Introduction: Jan Thulin

13h:45 – 14h:15 Background to ICES LME Working Group and Current Status Report: Michael O'Toole

14h:15 – 14h:35 The CoralFISH project: Contributing to the Assessment of Interactions between Coral, Fish and Fisheries in the Deeper Waters of the Celtic- Biscay Shelf LME: Anthony Grehan

14h:35 – 15h:00 Best Practices in TWAP for LME Assessment and Management: Ken Sherman

15h:00 – 15h:15 Tea / Coffee

15h:15 – 15h:40 Integrated Assessment: The Baltic Experience: Yvonne Walther

15h:15 – 15h:40 Estimated Number of LME Practitioners and Goal of 10 000 LME Practitioners: Marie-Christine Aquarone

15h:40 – 17h:00 Discussion / Planning Session on Best Practices in LMEs : Jan Thulin and Michael O'Toole (Co-Chairs)

17h:00 – 17h:15 Summary: Gotthilf Hempel

17h:15 End

Annex 4b: Agenda IOC-IUCN-NOAA Large Marine Ecosystem 13th Consultative Committee Meeting at UNESCO, Paris, France, 12–13 July 2011

DAY 1 – July 12, 2011

TIME	TOPIC	SPEAKER
9:00 am – 12:15 pm		
	IOC WELCOME	Wendy Watson-Wright Luis Valdes
	ADVANCING SUSTAINABLE DEVELOPMENT IN LMEs DURING CLIMATE CHANGE	
	Accelerated Warming & Emergent Trends in the World's Large Marine Ecosystems	Kenneth Sherman
	Fisheries Trends in LMEs	Daniel Pauly
	Effects of Climate Change on the Agulhas & Somali Currents LME (ASCLME)	David Vousden
10:30 am – 10:45 am	COFFEE/TEA	
	Report on the Meeting of the Transboundary Waters Assessment Programme (TWAP)	Julian Barbiere Sherry Heileman
	Advancing Sustainable Development during Climate Change within the UNDP LME Portfolio	Andrew Hudson
	GCLME NAPs, SAP & Best Practices; Outcome of Caucus on African LMEs; & Update on the Interim Guinea Current Commission (IGCC)	Stephen "Max" Donkor, Christian Susan
	Monitoring Climate Change in African LMEs through the GOOS-Africa network	Justin Ahanhanzo
12:15 pm – 1:30 pm	LUNCH	
1:30 pm – 5:00 pm	Topic – cont'd	
	Deepwater Horizon Impact on the Gulf of Mexico LME Project Implementation	Antonio Diaz de Leon, Porfirio Alvarez, & Bonnie Ponwith
	Toward a Large Marine Ecosystem-based Sustainability Science Knowledge Network	Suzanne Lawrence
	Towards Management of a Sustainable California Current LME – Assessing Ecosystem Health & Forecasting Climate Impact	Harold Batchelder

DAY 1 – JULY 12, 2011 (cont'd)

TIME	TOPIC	SPEAKER
	FAO Portfolio Overview of GEF LME Projects	Merete Tandstad
	Status of the Canary Current LME Project	Birane Sambe
	IUCN Perspective on Community based Advances in LMEs	Aurelie Spadone

3:15 pm – 3:30 pm	COFFEE/TEA	
	Socioeconomic & Sustainability Indices in LMEs	Jacqueline Alder
	The Western Indian Ocean Sustainable Ecosystem Alliance (WIOSEA): Towards an Adaptive Management & Governance	David Vousden
	MedPartnership Activities Related to Adaptation to Climate Change	Jose Luis Martin Bordes
5:00 pm	ADJOURN	

DAY 2 – July 13, 2011

TIME	TOPIC	SPEAKER
9:00 am – 12:00 pm	ADVANCING SUSTAINABLE DEVELOPMENT IN LMEs DURING CLIMATE CHANGE (cont'd)	
	Status Report on GEF LME Community of Practice (CoP) Project	Valdimir Mamaev
	Assessment & Monitoring of the Benguela Current LME in Support of the Benguela Current Commission	Hashali Hamukuaya
	Changing Conditions of the YSLME in Relation to Carrying Capacity for Sustainable Fisheries Yields	Qisheng Tang
10:30 am – 10:45 am	COFFEE/TEA	
10:45 am – 12:15 pm	Topic – cont'd	
	Best Practices in Assessment & Management in the Barents Sea & Norwegian Sea LMEs during Climate Change	Hein Rune Skjoldal
	Atlas Preparation for the Russian Arctic LMEs & Adjacent LMEs	Gennady Matishov
	APEC LME Project	MC Aquarone

DAY 2 – July 13, 2011 (cont'd)

TIME	TOPIC	SPEAKER
12:15 pm – 1:30 pm	LUNCH	
1:30 pm – 6:00 pm	ICES WORKING GROUP ON LME BEST PRACTICES	ICES Co-Chairs: Michael O'Toole, Jan Thulin
	Introduction & Overview	Jan Thulin Michael O'Toole
	Impact of Climate Variability on the North Sea Large Marine Ecosystem	Juergen Alheit
	The CoralFISH Project: Contributing to the Assessment of Interactions between Coral, Fish & Fisheries in the Deeper Waters of the Celtic-Biscay Shelf LME	Anthony Grehan
	Best Practices in TWAP for LME Assessment & Management	Kenneth Sherman
3:00 pm – 3:15 pm	COFFEE/TEA	
3:15 pm – 6:00 pm	BEST PRACTICES FOR CAPACITY BUILDING & MODELING FOR LMEs	
	Integrated Assessment: The Baltic Experience	Yvonne Walther

	Estimated Number of LME Practitioners & Goal of 10,000 LME Practitioners	MC Aquarone, Werner Ekau
	Summary	Gotthilf Hempel
	Discussion/ Planning Session on Best Practices in LMEs	Co-Chairs & ALL
	CONSULTATIVE COMMITTEE MEETING ON LMEs	
	Discussion/ Planning Session LME Consultative Committee 2011-2012	Chair & ALL
6:00 pm	ADJOURN	

Annex 5: Thematic Session M on Large Marine Ecosystems, ICES Annual Science Conference, 19–23 September 2011 , Gdansk, Poland

Theme Session M

Assessment and Management of Large Marine Ecosystems

Convener: Michael O'Toole (Ireland), Kenneth Sherman (USA), Gotthilf Hempel (Germany), and Yvonne Walther (Sweden)

Agenda and Order of the Day

Tuesday, 20 September 2011, 10:30–13:00 and 14:00–15:30 and 16:00–16:30, Main Concert Hall

1)	Opening and introduction	10:30
2)	Appointment of rapporteur	00:00
3)	Presentation of papers	00:00

Morning Session **Chair: Gotthilf Hempel**		
ICES CM code		**Time**
M:24 Paper	**Title:** Assessing Changing States of Large Marine Ecosystems	10:30
	Authors: Kenneth Sherman	
M:07 Paper	**Title:** Towards holistic ecosystem assessments – achievements of the ICES/HELCOM Working Group on Integrated Assessments of the Baltic Sea (WGIAB)	10:45
	Authors: Christian Möllmann, Lena Bergström, Thorsten Blenckner, Juha Flinkman, Anna Gårdmark, Martin Lindegren, and Bärbel Müller-Karulis	
M:12 Paper	**Title:** Reversing the degradation of the Canary Current Large marine Ecosystem	11:00
	Authors: Birane Sambe, Birgitta Liss Lymer, Ana Maria caramelo, and metere Tandstad	
M:09 Paper	**Title:** Implementation of the science plan in the benguela Current large marine Ecosystem	11:15
	Authors: Moses Maurihungirie	
M:17 Paper	**Title:** MESMA: Methodology for assessing the management of marine areas	11:30
	Authors: R. ter Hofstede, A. Paijmans, O. Box, J. van Dalfsen, P. Jones, S. Katsanevakis, G. Sutton, M. Rabaut, F. Thomsen, V. Stelzenmuller, and M. Vincx	
M:04 Paper	**Title:** Main bio-productivity features of the Western Arctic LMEs	11:45
	Authors: G. G. Matishov, P. R. Makarevich, E. I. Druzhkova, O. V. Karamushko, and O. S. Lyubina	

M:01 Paper	**Title:** Changing states and adaptive management actions of the Yellow Sea Large Marine Ecosystem **Authors:** Qisheng Tang	12:00
M:16 Paper	**Title: :** Capacity Building in Large Marine Ecosystems **Authors:** Werner Ekau	12:15
M:15 Paper	**Title:** Best Practices for Assessments of LMEs (and larger) **Author:** Jake Rice	12:30
M:05 Paper	**Title:** Assessing pelagic fish stocks from acoustic and trawl survey data in the Baltic Sea **Author:** Jarno Vanhatalo, Teppo Juntunen, Heikki Peltonen, and Samu Mäntyniemi	12:45
Close of Session		13:00

Afternoon Session **Chair: Yvonne Walther**		
M:10 Paper	**Title:** The Gulf of Mexico Large Marine Ecosystem Project, the way ahead **Author:** Porfirio Alvarez-Torres, Antonio Díaz de Leon-Corral, Jose Ignacio Fernandez- Mendez, Ramon Chavez-Amparan, Carolina Quiroz, Orlando Iglesias, Javier Acevedo, Ivonne Cruz, Susana Hernandez, Leoncio Frias, and Rafael Arreola	14:00
M:13 Paper	**Title:** The application of MSFD indicators in the Baltic Sea: How good are they? **Authors:** Daniel Oesterwind and Christian von Dorrien	14:15
M:08 Paper	**Title:** The Celtic Biscay Shelf and Western Iberian LMEs: How they differs from most other LMEs and why that difference should be valued. **Authors:** Dave Reid, Maria Fatima Borges, Pascal Laffargue, and Enrique Nogueira	14:30
M:14 Paper	**Title:** Decision-Support for the Economic Analysis of Trade-offs in Coastal and Marine Spatial Planning (CMSP) for the US Northeast Shelf LME **Authors:** Porter Hoagland and Di Jin	14:45
M:06 Paper	**Title:** Chloropigments-a in sediments in coastal zone as markers of eutrophication and environmental conditions **Authors:** Małgorzata Szymczak-Żyła, Grażyna Kowalewska, and J. William Louda	15:00
M:02 Paper	**Title:** Environmental genotoxicity levels in marine system "Baltic Sea-North Sea-Atlantic" **Authors:** Janina Baršienė, Aleksandras Rybakovas, Thomas Lang, Laura Andreikėnaitė, Wlodzimierz Grygiel, and Arvo Tuvikene	15:15
	Coffee break	15:30
M:03 Paper	**Title:** On the way towards the MSFD: Sensitivity analysis of size-based fish metrics for the use as indicators in an ecosystem based assessment framework **Authors:** W. N. Probst, H. Fock, V. Stelyenmueller, and M. Kloppmann	16:00

M:11 Paper	**Title:** Organic contaminants in sediments as indicators of pollution – a case study of the Gulf of Gdańsk **Authors:** Grażyna Kowalewska, Anna Filipkowska, Ludwik Lubecki, and Małgorzata Szymczak-Żyła	16:15
Closing of Session		16:30

Posters

M:18 Poster	**Title:** Interannual dynamics of zooplankton in the Canary Current Ecosystem **Author:** V. V. Lidvanov
M:19 Poster	**Title:** Primary productivity and eutrophication in two different types of Large Marine Ecosystems – the Baltic Sea and the Canary Current **Author:** Sergey Aleksandrov
M:20 Poster	**Title:** Flying fishes, marine birds, and elasmobranches as integrated biological indicators of LMEs' boundaries and their spatial and temporal changes **Authors:** Litvinov Feodor and Oleg Krasnoborodko
M:21 Poster	**Title:** Who eats whom? Insights into the complex food web of Chesapeake Bay **Authors:** Maja Walter, Muriel-Marie Kroll, and Ute Jacob
M:22 Poster	**Title:** A two-stage biomass model to assess the English Channel cuttlefish stock **Authors:** Michael Gras, Beatriz Roel, Franck Coppin, Eric Foucher, and Jean-Paul Robin

Annex 6: Synergies and Links between ICES and the LME Community of Practice

ICES	LME's
Long Track Record – of excellence in marine science and fisheries research >100 years	CoP Network - Immense network of marine scientists and managers in LME Community of Practice (CoP) worldwide involving over 100 countries
Knowledge Network – extensive marine science knowledge network in Europe, Canada and the USA	Common Modular Approach – use of 5 modules (productivity, fish and fisheries, ecosystem health and pollution, socioeconomics and governance) for ecosystem assessment. Allows for comparability between LMEs in thematic areas
Expert Working Groups – over 120 expert working groups and steering committees in specialised areas of marine science and management	Common Strategic Planning Tools – practical methodology developed by GEF-UNDP for planning and implementing LME projects i.e. TDA and SAP
Peer Review – strong peer review of scientific advice and publications	Global Reach and LME Diversity – LME's have global reach and cover large diversity of ocean space and marine ecosystems i.e. upwelling, tropical, Arctic and temperate, open and enclosed seas and systems
International Links – Close cooperation with global marine science initiatives i.e. PICES, IOC, FAO	LMEs and Regional Seas – strong links and between regional seas and LME programmes i.e. North Sea, Baltic Sea and Celtic -Biscay Shelf LME
Training – specialised training courses in fish stock assessment, EBM, integrated ecosystem assessment and climate change science	Ocean Governance LME Commissions - ecosystem based management being developed and implemented in some LME's through established Commissions i.e. Benguela Current and Guinea Current
Annual Science Conference – exposure to quality international marine scientific research and applied fisheries management	Annual LME Consultative Committee – experienced LME community of Practice through 13 years of annual consultative meetings of LME project managers – IOC, Paris
Collaborative Research and Expert Advice – expert advice from WG,, collaborative scientific research with LME partner	Policy Action- High levels of interaction between policy, management and science. Easy access to senior decision

countries e.g. EBM, ICM, MSP, climate change and fisheries; twinning projects between ICES and LME regions	makers and Ministers – through PSC and Ministerial Conferences
Sustainability Science – can assist in promotion of problem driven research within LME Community of Practice (LME CoP) initiatives	LME Knowledge and Information Sharing- offer enhanced opportunities to use LMEs as test-beds for new information technologies to advance collaborative research , develop environmental applications and encourage knowledge sharing
Global Partner – can strengthen ocean governance partnerships with developing countries through LME CoP and GEF:IW LEARN	LME Comparative Assessments - Eastern boundary upwelling currents such as Benguela, Humboldt, California and Canary offer great opportunities for comparative studies in EBM, MSP, IEA and climate variability
Data Management and Information Sharing – can provide advice on marine data collection / management, information sharing technology and communications; management support tools	Lessons Learned- the LME community have much to offer the global marine science community in terms of data gathered, lesson learned and best management practices

Annex 7: Priority Training Needs Identified by some LME Projects

Courses	LMEs	Numbers
Integrated Coastal management (ICM) and interface between freshwater and marine	Guinea Current; Bay of Bengal	116–125
Marine environmental economics and valuation of goods and services	Gulf of Mexico; Guinea Current	50–100
Climate change adaptation in coastal and marine ecosystems	Gulf of Mexico; Guinea Current	40–80
Methodologies for socio-economic impact assessment of LME Projects	Gulf of Mexico; Guinea Current	40–80
Estimating productivity indicators for LMEs	Guinea Current	50
Assessment of environmental impacts of offshore oil and gas exploration and production	Guinea Current	50
Ecosystem approach to fisheries management	Bay of Bengal;	16–24
Data collection and management	Bay of Bengal	16–24
Communication: science to management	Bay of Bengal	16–24
Fish stock assessment	Benguela Current; Canary Current; Bay of Bengal	50–100
Environmental law and natural resource economics	Agulhas Somali Current	10
Fisheries governance: science to management	Agulhas Somali Current	20
Data and information management	Agulhas Somali Current	20
Ecosystem based management	Agulhas Somali Current	20
Integrated ecosystem assessment	Agulhas Somali Current	20
Integrated coastal management and marine spatial planning	Gulf of Mexico; Bay of Bengal	35–50
Methodologies for ecosystem assessments and environmental impacts	Guinea Current	50

Ecosystem modeling and analysis	Benguela Current; Canary Current	35
Acoustic training –fish stock assessment	Benguela Current; Canary Current	35
Marine environmental economics	Canary Current;	14
Methodologies for socio-economic impact assessment of LME projects	Canary Current	14
Estimating productivity indicators for LMEs	Canary Current	14
Trawl survey design and evaluation	Benguela Current;	45
Decision support tools for LME management	Benguela Current,	60
Implementation of EAF	Benguela Current;	60

Annex 8: Some Best Practices resulting from selected LME Projects

Agulhas Somali Current LME	Benguela Current LME
- Establishment of strong baseline in oceanography, marine biodiversity and fisheries - Participatory TDA and MEDA process - Regional Alliance Partnership (ASCLME, SWIOFC, Nairobi Convention, NEPAD) - Website, newletters and brochures	- Strong TDA and SAP process with facilitation and GEF inputs - Establishment of Benguela Current Commission - Media liaison, coordination, website, newsletters, DVD and brochures - Decision support tools : State of the Ecosystem Information System (SEIS) - Publications, books and reports
Guinea Current LME	**Canary Current LME**
- Participatory TDA and SAP process - Establishment of Interim Guinea Current Commission - Development of National Action Plans (NAPs) - Regional fish stock assessments - Website, newsletters and DVD	- Frameworks established for TDA and SAP process - Key demonstration projects developed - Regional thematic working groups established - Regional training course for TDA and SAP development - Website, newsletters and brochures
Yellow Sea LME	**Bay of Bengal LME**
- Participatory TDA and SAP process - Major commitment by China and Korea to recovery and sustainability of YSLME goods and services - Significant reduction in fishing effort - Integrated multi-trophic aquaculture	- Participatory TDA and SAP process - Key ecosystem indicators selected - Work Plans developed for oceanography and pollution - Training course in scientific writing - National plans for pollution control

Annex 9: Recommendations

1) It is recommended that the Working Group on Large Marine Ecosystem Programme Best Practice WGLMEBP meet in July 2012 at UNESCO HQ, Paris, France, back-to-back with and after the 14th LME Consultative Committee Meeting.

2) It is recommended that ICES considers a formal partnership in the developing GEF LME/ICM CoP project (ICES Secretariat, ICES Head of Science Programme).

3) It is recommended that the chairs and members of the WGLMEBP in consultation with the ICES Secretariat intersessionally decide upon an Action Plan in relation to the CoP project (WGLMEBP, ICES Secretariat).

4) It is recommended that ICES country delegates further secure national participation in the WGLMEBP, especially in consideration of the growing importance of the Arctic LMEs (ICES Member Countries).

Annex 10: Summary of the LME/ICM-CoP Project Proposal

A Global Community of Practice to Improve the Management of Large Marine Ecosystems and their coasts (LME/ICM-CoP)

Over the last 15 years, the Global Environment facility (GEF) has provided substantial support through the GEF International Waters Programme to assist 127 recipient countries to work together within 19 of the world's 64 Large Marine Ecosystems (LMEs). This has enables countries to collectively identify the root causes of the priority issues affecting their LMEs through a Transboundary Diagnostic Analysis (TDA) process and to develop joint actions to address the root causes through Strategic Action Programmes (SAP). Large Marine Ecosystem projects use a five module approach that comprises productivity, fish and fisheries, pollution and ecosystem health, socio-economics and governance. The LME projects also address integrated coastal management (ICM) and climate change and establish multi-national ecosystem-based assessment and management practices to reduce coastal pollution, restore habitats, recover depleted fisheries, protect biodiversity and adapt to environmental variability.

The objective of this project is to generate knowledge, build capacity, harness public and private partners, support learning and improve the performance of International Waters projects through a Community of Practice (CoP) for the sharing of ecosystem-based management approaches to Large Marine Ecosystems (LMEs) and their coasts (LME/ICM-CoP) and best practices.

The project comprises of four components each with a series of expected outcomes and outputs. These can be summarised as follows:

Component 1

The establishment of a global and regional network of partners to enhance ecosystem-based management and to provide support for the existing Global Environment Facility - International Waters (GEF-IW) LME projects to incorporate Integrated Coastal Management (ICM) and climate variability and change into the existing modular approach.

Outcomes would include enhanced network of partners to provide management and technical support to LME projects and increased interaction and collaboration between projects and other marine and coastal initiatives within LME regions. Significant progress would also be made towards fully integrated ecosystem-based management in GEF IW surface ground water and LME projects. Outputs would include the establishment of a Secretariat, a Technical and Policy Level Steering Committee, Working Groups and a project website for sharing best practices, knowledge management and learning.

Component 2

The capture of best practices and development of new tools and methods to enhance management effectiveness of LMEs. Expected outcomes would include equipping LME projects with new tools that incorporate integrated coastal management, climate variability and change and using these to address emerging priorities.

One of the main outputs of this component is a toolkit for adaptive ecosystem based management which incorporates tools (including training and education material) on best practices and produced as a web-based management system.

Component 3

The establishment of capacity building partnerships through twinning and learning exchanges, workshops and training.

The outcomes from this component will increase capacity building, collaboration and learning exchanges between LME projects (South to South, North to South and South to North) as well as with other non GEF-funded marine and coastal initiatives.

Education and training material would be made available to stakeholders including new techniques and approaches for best practices in ecosystem-based assessment.

This would increase the capacity of LME project managers to address the priorities of the GEF Operational Plan 5 through portfolio learning, partnerships and training.

Key outputs would include learning exchanges, twinning and training workshops among LME and other projects. New training materials and courses would be developed in collaboration with partners such as ICES, FAO, IOC, NOAA, IOI, IUCN and others. A key outcome of this component will be the implementation of a training strategy with the aim of achieving 10 000 practitioners fully trained in ecosystem-based management techniques and approaches including adaptation to climate change and environmental variability.

Component 4

The communication, dissemination and outreach of LME project achievements and lessons learned.

Expected outputs will include communication of results, increased awareness of LME issues and engagement through regional and global networks. A strategy will be developed for showcasing LME and integrated coastal management best practices to project partners and all stakeholders. Greater visibility of achievements will be given along with increased web-presence through social networking sites, LME and other partner's websites. Global policy discussions will also be informed and impacted by knowledge and experience of the GEF LME/ICM project. The expected outcomes will be a global communication platform linking LME projects using a distance learning information sharing tool (D-List) with other relevant UN initiatives and partners. Lessons learned for LME projects would be disseminated through the IW: LEARN website, partners and the LME/ICM CoP website. Other outcomes will be increased number of publications from LME/ICM projects in peer reviewed scientific, coastal and ocean management journals and participation of LME projects staff and practitioners in regional and global conferences e.g. Global Forum, Rio Plus 20 and ICES Science Conferences.

Project Partners and Co-Finance

The project will be global in reach and will be implemented by UNDP and executed by UNOPS. Funding by the GEF if approved by the Council is expected to be about $4.0 million with another $4.5 million coming as co-finance from partner institutions and agencies. Partners are expected to include NOAA, IOC-UNESCO, ICES, IUCN and FAO amongst others. The project is expected to run for a 4 year period.