

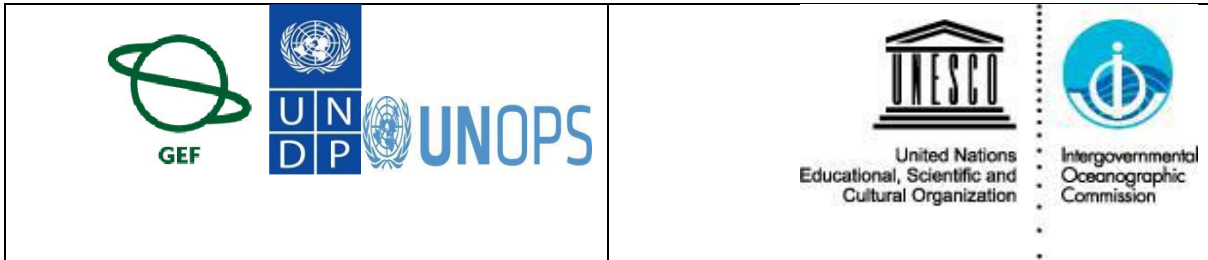


The CLME Information Management System (IMS) and Regional Environmental Monitoring Programme (REMP).

IMS/REMP Promotion and Awareness Workshop Summary Report Deliverable D.4.1

The “Sustainable Management of the Shared Living Marine Resources of the Caribbean Large Marine Ecosystem (CLME) and Adjacent Regions” is a GEF funded Project. Its main objective is the Sustainable management of the shared Living Marine Resources of the Caribbean LME and adjacent areas through an integrated management approach that will meet the WSSD target for sustainable fisheries.

This document summarizes main discussions and recommendations of the IMS/REMP Promotion and Awareness Workshop held in Playa del Carmen, Mexico 29 – 31 January, 2013.



**UNESCO IOC SUB-COMMISSION FOR THE CARIBBEAN AND ADJACENT
REGIONS (IOCARIBE)**

IMS/REMP Promotion and Awareness Workshop

(Playa del Carmen, México, 29 – 31 January, 2013)

DRAFT SUMMARY REPORT

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1. OPENING

The meeting was opened on Tuesday 29 January 2013 at 09.00 am.

Dr. R. Zamanilla, Secretary of Science and Education, welcomed the participants in the Palladium Hotel, Playa del Carmen, Mexico. He presented two thoughts relevant in the context of this meeting. First, it is new that decision making will make use of scientific data. This makes scientific data so important, and gives a great responsibility to the scientific community. Second, he stated that we are discovering that “my reality” is not real, at least not complete; the “real” reality is in fact the sum of all our realities, of our different perspectives. Therefore we need to integrate and analyze data from many different and complementing sources, in order to make responsible decisions aimed at sustainability. He wished the participants a fruitful and creative meeting.

Paul Geerders, project leader IMS/REMP gave an introduction of the meeting and the logistics. He mentioned that the meeting had various purposes: the promotion of the IMS, the obtaining of feedback for further improvement of the IMS, and the creation of awareness in the CLME member states on the importance of data and information management. Furthermore he advised the participants that all documents of the meeting were available at the IOCARIBE web site. In relation to the required feedback on the IMS, a questionnaire was distributed in English and Spanish (resp. Annex 4 and 5). He welcomed the participants and the experts, and invited them to carefully review and evaluate the IMS, and provide suggestions for improvement and for the future.

In his welcome, Bob Glazer, of the Gulf Caribbean Fisheries Institute, GCFI, the responsible for the technical development and implementation of the IMS, mentioned that he will introduce the beta version of the IMS during the evaluation sessions. He looked forward to the feedback via the questionnaire. This feedback would be directed towards: the contents of the IMS, the current priorities and the required development in the future.

2. ROUND TABLE INTRODUCTION

Paul Geerders invited the participants to introduce themselves. The audience includes participants from the CLME countries as well as invited experts.

3. IMS/REMP

Paul Geerders provided an introduction to the IMS/REMP component of the CLME project. REMP stands for Regional Environmental Monitoring Program and is aimed at the state of ecosystems and environment, and on the effects of policy measures and actions resulting from the Strategic Action Plan, SAP of the CLME. IMS is the Information Management System, which provides references to data and information mostly through URL's. It refers using metadata to archives of data and information. REMP will identify,

gather and integrate and use references IMS/REMP is not aimed at creating yet a new database in the region. An important element in this project is ensuring the availability and the quality of data and information to support indicators for decision making.

Some of the current topics in IMS are: biodiversity , fisheries publications of CRFM (regional fisheries mechanism), monitoring programs, non-traditional information sources, sources of data and information, the GRAMED Assessments, links with IOC's systems: OceanData, OceanExpert, and OceanDoc, regional agreements.

Foreseen is the inclusion of information on the state of the SAP implementation, data and information supporting the 3x3 matrix, data acquisition methodologies and technologies, literature on economic valuation, laws and regulations, funding opportunities and the results of three demonstration projects. These demonstration projects show how IMS can support a full policy cycle, and were related to Integrated Coastal Management, Spiny Lobster management and Economic Valuation.

It is hoped that through the SAP, various important issues related to data and information management can be implemented, such as:

- A mechanism for permanent , operational harmonized monitoring
- Capacity for monitoring and for data management
- Research and development concerning numerical models for simulation and forecasts
- Agreement on sharing data and information
- Research and development concerning expert systems (DSS).

The participants from the CLME member states were invited to anticipate on the implementation of the SAP by reviewing the current situation of ecosystem and environmental data and information, and consider initiating projects aimed at the recovery of relevant historic data and information.

He concluded that the IMS already provides useful information, but in order to become even more useful and sustainable it requires:

- institutional commitment to maintain the contents of the IMS updated
- an effective regional monitoring mechanism to fill in the gaps and provide updated data and information to generate indicators
- to reach a regional agreement on sharing of data and information

Furthermore it was observed that IMS refers to the IODE mechanism as an important source for historical data, and a facility for training on marine data and information management.

Dr. Cesar Toro commented that the IMS should first of all respond to the requirements of CLME. At this workshop, IMS needs to receive the feedback from users. He emphasized that IMS is a metadata system and not a database per se. In this context he also referred to the importance of IMS for the UN regular process World Ocean Assessment. Although primarily IMS and REMP are tools to help realize the goals of CLME

and SAP, but they also connected to other global ocean programs concerned with impacts on environment and economies.

It is expected that the IMS/REMP combination in future will lead to an adaptive system supporting sustainable development. The idea in this context is to create a mechanism to distribute support responsibilities within the region (subsidiarity principle). And perhaps in the future some of the data and information products from IMS/REMP can be commercially promoted to help maintain the system.

4. CLME PROJECT

Patrick Debels, project coordinator CLME, presented the Caribbean Large Marine Ecosystem project. The major objective of the project is to restore and sustain fish stocks and associated biodiversity through an ecosystem approach, as promoted by GEF. The CLME area includes besides the Caribbean countries also the North Brazil Shelf. The Strategic Action Plan, SAP, to result from the current first phase of the project, should lead to improved policies and management practices, in order to have a positive effect on ecosystems and environment. The project should lead to long term investments in programs that supply tangible results to the ecosystem, and therefore to the fishers of the region.

CLME deals with a complex process encompassing the three key problems identified in the area: non sustainable fisheries, habitat degradation and pollution, and the three fisheries sectors: pelagic, continental shelf and reefs. The latter are closely related to mangroves and sea grass. As a common cause, the impacts of climate change are being included in the considerations. One of the root causes that came forward from the cause and effect analysis done at the onset of the project is the limited availability of data.

IMS/REMP is an important mechanism for monitoring and evaluation supporting the implementation of the SAP, especially since it helps in the generation of the required indicators for each of the problems and the sectors identified. The concept consists of a closed chain: data – analysis – decisions – implementation – revision and evaluation, which connects: IMS – REMP – DSS.

It is expected that in 2013 and following years, the region will move towards implementation of the strategies and actions formulated in the SAP, in spite of the fact that the region is one of the most complicated LME's in view of the number of countries, cultures, languages and political history. It was emphasized that GEF mainly works with governments and governing bodies, although some small grants are made available to support NGO's and small groups involved in community fisheries.

It was observed that Colombia has a project in San Andres related to conch. In this project aimed at the management of this resource science, industry and artisan fishers are working together.

Concerning the history of the project, Cesar Toro reminded the participants of the fact that the ecosystem approach was decided upon in an early stage. This approach was

and is promoted by GEF and FAO. The LME concept was promoted by NOAA (Ken Sherman). He used five perspectives: governance, socio-economy, pollution, fish and biodiversity, and productivity. These 5 modules may also inspire work in IMS as there are results of earlier work available.

As an alternative to the bio-geographic approach of CLME, a socio economic approach could also be followed, based upon existing structures and through governance. However, there are also bio-geographic processes, such as lobsters and fishes moving across borders and transcending cultures.

5. GCFI - THE IMS DEVELOPMENT

At the beginning of his presentation, Bob Glazer gave a picture of the Gulf Caribbean Fisheries Institute, GCFI. It is a non-profit organization dedicated to bringing stakeholders together for sustainable use of marine resources in the region. It celebrates an annual conference bringing together the relevant stakeholders from the countries of the region. Principal activities relate to: Fisheries for Fishers, the impacts of climate change, and education.

From several offers, GCFI was selected to carry out the website development of the IMS. The experience of GCFI with the CAMPAM database (Marine Protected areas) is certainly helpful in this context. Because the IMS, although initially of a simple concept (metadata base), its internal structure is complex, due to the many different themes to cater for. IMS is metadata base, it is not a data repository. The User Manual for IMS is on line available on the IMS website, both in English and Spanish, as well as in the form of a mobile app.

Bob Glazer presented a quick walkthrough of manual, including its page flipping option. In this context he also referred to the Mapping Project of IMS; this implies that if certain metadata includes geospatial information (a geographic position) then that metadata can be presented on a map with a marker. However, not all information in the IMS includes geographic information.

As possible next steps for the near future he mentioned: change style to bring IMS more in line with the CLME website, improve the keyword queries, provide an off line version, develop and include new applications including social media, enhance the functionality of existing applications, and integrate analyses and management priorities, such as the 3 x 3 matrix. Also ways are being sought to provide a transparent access to other databases in the region and make IMS visible in their searches.

In the discussions it was mentioned that there are common or frequently used words that could be immediately translated or be equated. Also, it would be better to have results returned in an ordered (alpha, chrono) manner. According to Bob Glazer, both topics are on the list of things to be implemented in the future. This also relates to the development of a list of equivalent terms (synonyms). The results from the pilot projects, such as on economic valuation, will soon be available as links in the IMS, as well

as information on biodiversity protocols and methodologies, and on biodiversity and ecosystem data already available on the Web.

6. IOC-IODE - MECHANISM FOR MARINE DATA MANAGEMENT

Carlos Torres made a presentation on the Intergovernmental Oceanographic Commission, IOC and its Committee on International Oceanographic Data Exchange, IODE. The main objective of IODE is to coordinate ocean data exchange among member states of IOC. In this context, IODE has established national ocean data centers (NODC's) around the world since 1950. The policy of these NODC's is to provide timely, free and unrestricted access to oceanographic data. While in 1960 there were 4 NODC's, in 2012 there were 81.

IODE covers both marine information and marine data. Data is considered to be observable, raw values, while information refers to the results of interpretation and to products. IODE provides and supports training and education in marine data and information management. For each member state there are in principle 2 delegates, one data manager and one expert on marine information management.

IOC and IODE provide a number of on line information systems:

- Ocean expert, Database with information on ocean experts
- Ocean teacher, Training courses on marine information and data management
- Ocean docs, Electronic Repository of documents and publications
- Ocean data, a portal to access data

He also mentioned the OBIS system (Ocean Biogeographic Information System) which is basically a world-wide ocean biodiversity data base (www.iobis.org). It includes facilities for data discovery and information, it can collect data for re-use, facilitates data integration from the Census of Marine Life. It serves a community of practice and all data are freely accessible online.

OBIS aims at forging links between the NODC's and regional agencies, for instance to support the development of marine atlas, based upon data and information from local portals integrating biodiversity and oceanography. It also provides a distributed training network.

IODE has various regional network and training centres. For the CLME countries is relevant the ODINCARSA - Ocean Data and Information Network in the Caribbean and South America. It was established in 2001 and aims at contributing to ocean science, operational oceanography, integrated coastal management, amongst other subjects. ODINCARSA also includes a marine information management group which provides the Latin American regional union list of serials as a document delivery service (www.portaloceanico.net).

In order to be able to support decision making, there should be integration between data bases and information, leading to knowledge and understanding. This is illustrated by the activities of the Mexican NODC, the CENDO: Centro Nacional de Datos Oceanograficos. Amongst other sources, it is based upon the SINAMO, a large, real time integrated national monitoring system and data network. SINAMO has a data and information portal and connects to the World Data Centers. Various tools are provided to the user to visualize and plot data, including fisheries data. CENDO has actively been engaged in the development of an atlas of the seas and coasts of Mexico. The atlas serves as a design tool for environmental planning and management.

In the discussion, Cesar Toro observed that large sources of data exist on the region. IMS/REMP has identified many of these sources and the corresponding sites. Initially, IMS is devoted to CLME and its specific needs. IODE allows access to large data bases of mostly historical oceanographic data. He also mentioned that a next training course on data management is shortly due in Barcelona, Spain. He invited the countries to consider to the world archive of oceanographic data, the necessary tools are available from ODINCARSA. Finally he emphasized the importance of salvage of historical data archives through dedicated search and rescue projects.

7. GOOS – GLOBAL OCEAN OBSERVING SYSTEM

In connection with the preceding presentation on IOC and IODE, Doug Wilson made a presentation on IOC's Global Ocean Observing System, GOOS. This system consists of a number of essentially independent observing systems providing real time data on various aspects of the world oceans. Most of these systems are based upon satellite observations, while some make use of fixed platforms such as fixed and free floating buoys. GOOS is also relevant for the CLME area, for instance in relation to early warning for tsunamis.

8. IAMSLIC-SAIL - MARINE INFORMATION MANAGEMENT

Nathalie Wiest provided the meeting with a view from the standpoint of a librarian. She provided background information on IAMSLIC, a world-wide network on marine information, related to aquatic and marine science. It has 300 members spread over 70 countries and the membership includes universities, government entities, and private industry. It celebrates an annual conference and an e-mail discussion group and promotes continuous education in information management. One of the regional groups is SAIL which includes Caribbean as well as Latin America.

IAMSLIC has an MOU with IOC to support their educational projects, the same for FAO. One of the more important products is Aquatic Commons, which is tailored to groups with no institutional repositories. The example is given of Texas Digital Library (www.tdl.org). The system includes online access to data used in publications and uses the Duraspace software.

She recommended that IMS should consider natural language to allow for free-text searching in the data base.

In the context of a discussion on copyright issues, she mentioned that one cannot scan journal reprints. She referred to a project where GCFI paid a relatively small sum to scan historical proceedings.

9. THE IMPORTANCE OF NON-TRADITIONAL INFORMATION

Marvin Fonseca provided a presentation on the value of traditional knowledge and the importance of including the local population in projects such as CLME. Specifically he referred to the experience gained by the NGO CoopeSolidar in Costa Rica, with contributions of local groups to the conservation of biodiversity and the protection of fisheries resources. Apparently it is not obvious to include the collective traditional knowledge of fishermen in such processes because as stakeholders they are seldom visible at international level. How to learn from the good practices such as in Costa Rica in order to enable good governance? Governance should not be only problem solving but should be a process aimed at well informed decision making involving all stakeholders. This could avoid serious mistakes such as the relocation of fishermen far from the coast.

He noted that the fishermen usually have strong community feeling, with specific culture, identity and feeling of belonging. They have a strong relation to the marine-costal environment, often already for generations; mostly it is their only living. Problem is that much of their understanding is not written down but is transferred orally, or by music or art, and therefore it is difficult for them to take part in the political process and structures. It is important to understand these issues in order to establish a working relationship. But if this works, the local fishing communities are excellent allies for conservation, the men for the fishing part and the women about pre and post fishing.

In the conservation and regulation process it is important to respect the community structures and customs, and also to support the process with financial management; this works out in mutual trust. Today, often the information provided by fishers is incorrect due to lack of trust, and this causes poor decisions and malfunctioning regulations.

He showed several movies to illustrate this process with the experience in Tarcoles, Costa Rica, where in an effective way local knowledge was successfully combined with scientific information. This result was reached since all stakeholders were involved in the decision making process. The process achieved a marine zoning in Tarcoles, based upon interactive mapping carried out with the fishermen, separately with the men and the women. The maps were later converted into GIS maps. Currently the community manages a database in Excel of stocks and economics from 2005 to 2013.

The project in Tarcoles also involved elements of fishing techniques and gear, monitoring, quotas and alert systems. The project is given wide publicity in the press with proper credits for the local community. It is the intention to replicate this experience of dialog instead of confrontation in other countries of the region. CLME might provide a

good opportunity to establish long term relationships also with other fishing communities in the Caribbean region.

The approach was supported by similar experience in Chile where it was implemented working with a fishermen's organization for 20 years, supported by external funds. Fishermen presently participate in decision making on quotas and guidelines; it is definitely a long process of negotiation between fishermen, industry, business and government.

Since CLME works with GEF funding and GEF only works with the central government, there is only little chance that CLME could support this sort of projects. It entirely depends upon the willingness of governments to include the local communities in the governance process, although the SAP includes this issue in its strategies explicitly. It is certainly important to complement the academic indicators with locally developed indicators. Probably the GEF Small Grants funds could be used to sponsor such projects.

A recent bilateral initiative between Chile and Peru expresses its interest to profit from the experience in Costa Rica. The importance of non-traditional knowledge will certainly also be included in the considerations of the Inter-LME Working Group on Data and Information Management.

10. DATA POLICY AND RELATED ISSUES

Frans von der Dunk made his presentation from Leyden, the Netherlands, via Skype. He noted that a strengthened governance of the LMR in the CLME area could not be achieved without a broadly accepted and coherent CLME Data Policy. Such a policy would ensure access by present and future users, guarantee the usefulness of long term data, and ensure the availability of data and information for indicator generation. At the same time such a policy would protect the rights of relevant researchers, and of governments and entities facilitating and financing data acquisition.

A CLME data policy should therefore include statements on:

- Institutional management of data and information
- Regulation of access to the data and information
- Regulation of promotion of the data and information

Specific complicating issues in the context of IMS/REMP include:

- The integration of data and information on various geographic areas, on a variety of themes and from many sources
- The coverage of both territorial waters and international waters
- The fact that the data and information is being held by various entities such as: government and other public entities, individual scientists in their respective service, NGO's, and perhaps industry
- The use of paper and electronic formats.

General international laws stipulate the freedom to collect information – as long as no other legal rules are violated – as a human right. However this freedom is subject to national sovereignty rules, and other laws and regulations. Besides there are laws of tangential interest such as UNFCCC and Kyoto as general environmental treaties, dealing with specific issues such as climate change, pollution and dangerous activities at sea.

As a case study he refers to Space Law (UN Resolution 41/65 1986) which provides generic freedom to undertake remote sensing from space of any country, but at the same time includes the obligation to provide data relevant for mitigation of specific threats to the natural environment. This Law is largely accepted as customary international law (but is not binding), and is reflected in some national laws (US, France) and data policies (US, France, Canada).

In this context WMO Resolution 40 (1995) promotes free and unrestricted exchange of meteo data in particular within and between research and education communities. IOC has a similar data policy aimed at oceanographic data.

Intellectual property rights and copyrights provide a broad scope as to types of data. While originally national, it has now largely evolved towards the international scene through mutual recognition and harmonization of national regulations. However, still the protection is per country, territorially defined. The Anglo-Saxon approach refers to the “sweat of brow”, which implies a low threshold and a low protection. The (European) continental approach refers more to “creativity” which leads to a higher threshold but also a higher protection. Consequently, intellectual property rights can indeed act as a tool of control in the context of a data policy.

From the international perspective, the process of data generation / collection / analysis could be seen as “sweat of brow” and “creativity”. In international waters there are probably few obstacles. The various treaties support but certainly do not oblige. What happens in national waters depends on national permission, except of course remote sensing from space. In the case of scientific field work, clear arrangements need to be made concerning the ownership of the data, and the obligations of the visiting scientists.

He presented the following recommendations:

- consider further development of the current IMS/REMP portal into a central database depository portal
- take into account difference between paper & electronic
- clarify existing IPR on external data in order to avoid confusion
- establish an IPR regime to control data being accessed via the portal
- analyse US and EU policies as a guidance especially also relating to the cost issue
- analyse INSPIRE and AARHUS regulations (Europe)
- draft appropriate disclaimers of liability

The law can act as a policy framework, since existing law offers major incentives but also limitations to maximizing use of data for managing an LME. But law can also act as a policy tool, to help implement policy options and give them more visibility, permanence, stability and enforceability.

Concerning liability in case of erroneous data accessed through the IMS metadata, it was observed that such cases have not been signaled before and seem difficult to regulate. Anyway, with regard to quality, the full chain from acquisition to the final data file has to be reviewed.

Variations in legal regimes in the region may be a problem. For example if a country has a law for fishing regulation that affects other countries. International agreements are many and are not adequately harmonized among the countries of the CLME region. IMS is planning to include a theme on the various laws and regulations in the region relevant in the context of CLME.

11. INSTITUTIONAL INFORMATION MANAGEMENT

Eric Kokke made the case for the proper organization of information within institutions. Because, as he stated it: Information is Gold. But if information (data, samples, documents) is not properly organized, the institution cannot fully profit from the information, and valuable time and effort is lost in the process of localizing the required information. This becomes particularly relevant now we are dealing with strongly increasing amounts of information, almost an information overload. Therefore information needs to be properly stored and preserved, along with the corresponding metadata, which will allow a justified interpretation of the information, also after a long time.

He presented the experience of his organization, SOD-Opleidingen in the Netherlands, which trains government information managers in the proper procedures for information management. This includes issues such as: records management, metadata, e-mail management, registration of mail, integration with Enterprise Content Management, information protection, quality management of information. He proposed that similar training could be provided to the government institutions in the CLME countries.

As a hands on example he provided the participants with a generic folder structure, which could form an inspiration for an institution-wide standardized folder structure to be implemented on PC's, laptops, tablets and for e-mail.

12. ENVIRONMENTAL MANAGEMENT OF A HOTEL

On behalf of the Palladium Hotel, Mrs. Rebecca Garcia gave a concise presentation on the various aspects of environmental management in the hotel Palladium, where the meeting was held. She provided interesting details on how the hotel deals with its (natural) environment as well as on how the hotel tries to minimize its impact upon its environment. The emphasis of the hotel is on recycling and on the use of closed systems avoiding all possibility of contamination of the surroundings. This approach proves to be very efficient in terms of cost, especially on the long run.

13. RESULTS OF THE WORKING SESSIONS.

The participants were invited to consider what information need to be in IMS and to provide their ideas on how does it get updated? They were asked to spend some time, working in three groups, to develop list of references, records, URL's, etc. that are still missing from the system. Also it is important that the groups identify how we need to move forward.

In this context the various types of indicators required for the governance process were mentioned: process indicators, stress reduction indicators and status indicators. Certainly also socio-economic indicators could be taken into account.

The results of the working groups are presented in Annex 3.

14. FINAL DISCUSSION, EVALUATION AND CONCLUSIONS

The participants were happy with the meeting and its various outcomes. The opportunity to work with the IMS was certainly successful, although some found there was too little time for this. The meeting has been an opportunity to assess how each of the countries is participating and contributing to the IMS, and an incentive to move forward in this respect. Furthermore it was a good opportunity to share ideas on the IMS and its future.

In the further development of IMS, the issue of language will certainly be considered. Perhaps also a standard list of Latin names needs to be made available and be used for searches.

It was advised that IMS should consider more fisher participation in the process and develop mechanism to make the IMS useful for fishers.

Although over the years much information has been carefully and systematically gathered, it is apparently still a big challenge to share, manage and properly organize that data. A specific issue in this context is data rescue, the salvage of historical data sets. It is expected that IMS/REMP can help to develop and implement such projects.

The results of the IMS pilot projects should be included in the system as soon as possible.

This workshop has also been important for the development process of the CLME and the SAP. And this is certainly an important component of the CLME. IMS/REMP plays a critical role in the development and implementation of the SAP. In that sense it could be useful for the participants to establish a contact with their National Focal Point, NFP for the CLME to ensure a proper inclusion of the data and information issue in the SAP.

The recommendations given during the workshop will prove very useful for the further development of the prototype. IMS/REMP is of course only one component of the

larger CLME project. The participants were urged to consider IMS/REMP as their project and intensify their participation through the provision of information on links to data sources that they know of. The IMS/REMP team remains available so feel free to contact them.

In this context, Paul Geerders proposed to establish a Yahoo group to facilitate the exchange of comments and to allow all participants to stay involved in the project; this idea was welcomed. He also mentioned that he intended to propose some training exercises on data and information management in the near future. Finally he suggested the participants when back in their countries to look around for potentially valuable historical data sets on ecosystems and environment. Possibly these can be rescued in a joint effort with IMS/REMP.

15. CLOSURE

On Thursday 31 January 2013 at 2.00 pm, Paul Geerders closed the workshop, thanking the participants for their valuable contributions. He also expressed his thanks to the IOCARIBE secretariat, to the interpreters and to the personnel of the Palladium Hotel.

ANNEX I

AGENDA

29 Jan			
ITEM	DESCRIPTION	TIME	DOCUMENTS
	Opening	0900-0915	
	Round table introduction	0915-1015	
	CLME, IMS/REMP	1015-1115	
	Coffee Break	1115-1130	
	GCFI, the IMS development	1130-1230	
	Lunch	1230-1400	
	Work with IMS	1400-1530	
	Coffee Break	1530-1545	
	Work with IMS	1545-1630	
	Discussion/questions	1630-1700	
	Welcome Coctail Party	1900-2000	
	Dinner		
30 Jan			
	IOC-IODE, mechanism for marine data management	0900-1000	
	IAMSLIC-SAIL – marine information management	1000-1100	
	Coffee Break	1100-1130	
	GBIF/IABIN – biodiversity information issues	1130-1230	
	Lunch	1230-1400	
	Work with IMS	1400-1515	

	Coffee Break	1515-1545	
	Work with IMS	1545-1630	
	Discussion/questions	1630-1700	
	Dinner		
31 Jan			
	Non-traditional information	0900-1000	
	Data Policy Issues	1000-1100	
	Coffee Break	1100-1130	
	Institutional Information Management	1130-1230	
	Lunch	1230-1400	
	CLME-SAP and the role of data and information	1400-1500	
	Coffee Break	1500-1530	
	Final discussion, evaluation, conclusions, actions	1530-1700	
	Dinner		

ANNEX II – LIST OF PARTICIPANTS**EXPERTS****ANTIGUA & BARBUDA**

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ANNEX III

Synthesis of the results of the working groups.

Indicator	Type of data
Ecosystem status	fish landing data (fisheries dependent / independent), diversity indices
Ecosystem function	fish landing data (fisheries dependent / independent), diversity indices
Trophic structure	fish landing data (fisheries dependent / independent), diversity indices
Eutrophication	chlorophyll, water chemistry, algal cover, species composition studies, diversity indices
Stress reduction	sustainable fishing, stock assessments
Pollution	water quality: dissolved oxygen, water chemistry, (possibly via satellite), indicator is disease (coral, fish), incidence/impact of fish borne pathogens/toxins
Health of fishermen	days lost
Invasive species	number of invasives, abundance
Socioeconomic incidence of piracy on fishing fleets	\$\$ lost (income, boats)
	diversity of marine-based employment
IUU fishing	prosecutions and fines
	% area protected by MPA's
artisanal vs. commercial fisheries	number and type of fishing licenses
	boat licenses (types of vessels and activities)
socioeconomic	enforcement expense
	value of landings per fisher

stress	coastal development / permits / land value
	working waterfront
	development diversity
climate	SST
	ocean acidification (pH, pCO ₂ , atmospheric concentration)
	ocean/atmosphere circulation patterns
	incidence of storms coastal disaster expenditures
	precipitation / salinity
	coastal erosion
	sea level rise
Stress indicators	live coral cover
	bleaching incidence
Process	number of management plans
	number of MPA's
	by-catch and by-catch monitoring
	# of countries that signed onto treaties, protocols, etc.
stress & others	# of species with changes in conservation status
environmental laws and regulations	resources associated

Potential sources of information and data, related to sustainable fisheries and other living resources, in a number of CLME countries:

Country	Indicator/Data type	Institution/Source
Mexico	Catch and effort	INAPESCA/CONAPESCA/SAGARPESCA
	Oceanographic data, Sea surface temperature, physical and biological data	SATMO/CONABIO
	MPAs	SEMARNAT
	Meso-American Reef Information	Amigos de Asian Kaan
	Oceanographic data	UNAM, CINNEVESTA
	Bathymetric data	SEMAR

	Red-tide events	SEP
	Oceanographic data	UABC
Grenada	Catch and effort, biological, export data	Grenada Fisheries Division
	Water quality, beach profiles, MPAs	Ministry of Environment
	Water quality, microbiological data	St. Georges University
St. Vincent and the Grenadines	Catch and effort, biological, export, water quality	St. Vincent and the Grenadines Fisheries Division
	Water quality	Ministry of Health and Environment
	Biological data, water quality	Tobago Cays Marine Park
Haiti	Catch and effort	Haiti Fisheries Department/Ministry of Agriculture
	Environmental, water quality, physical data	Ministry of Environment-Service of Coastal and Marine Ecosystems
	Water quality, sea surface temperature	State University of Haiti, Quisqueya University
	Marine species biodiversity	Foundation for the protection of marine biodiversity
	Catch species composition and sizes	ANP
	Oceanographic data, physical data, tides	Coastguard
	Climate	Meteorological Department
Curacao	Catch and effort data	Ministry of Health, Environment and Nature/Agriculture and Fisheries Management
	Habitat quality and ecosystem information, MPAs	Environment and Nature Management
	Sea-level	Meteorological Department Curacao
	Habitat quality data, ecosystem information, sea-level, water quality, sea turtles	CARMABI
	IUU	Coastguard for the Dutch Kingdom in the Caribbean
Trinidad and Tobago	Catch and effort data, species biodiversity, MPAS, biological data, socio-economic data (export and import of fisheries products, cost and earnings), GIS, FISMIS (document storage and retrieval for Caribbean Fisheries Management), local knowledge surveys	Fisheries Division, Ministry of Food Production

	Marine biodiversity surveys	Ministry of the Environment
	Sea-turtle monitoring	Forestry Division
	Trade, socio-economic data	Central Statistical Office
	Vessel registration	Ministry of Transport
	Critical and endangered species and areas, EIAs	Environmental Management Agency
	Sea-turtle population monitoring	Nature Seekers, Environment Tobago
	Sea surface temperatures, salinity, GIS	Institute of Marine Affairs
	Biological data, EIA, socio-economic data, physical data	Private Consultants
	Sea-surface temperatures, bathymetry, fishing areas	Trinidad and Tobago Industrial Fishers, Longline Associations, Fishing associations
	Theses	University of the West Indies, University of Trinidad and Tobago
	Pollution, water quality	Industries
The Bahamas	Catch and effort data, species biodiversity, MPAS, biological data, socio-economic data (export and import of fisheries products, cost and earnings), GIS, local knowledge surveys, marine biodiversity surveys, Sea-turtle monitoring, EIAs	Department of Marine Resources-Fisheries
	GIS	GIS Department
	Marine biodiversity surveys	Bahamas National Trust, The Nature Conservancy, Bahamas Reef Environment and Education Foundation,
	Trade, socio-economic data, employment data	Ministry of Finance, Department of Social Services
	Vessel registration	Port Department and Department of Fisheries
	Critical and endangered species and areas, EIAs, water quality	Ministry of Environment-Best is Bahamas Environment Scientific and Technology Commission
	Sea surface temperatures, salinity	Department of Meteorology
	Theses, biological data, socio-economic data	College of Bahamas
Jamaica	Catch and effort data, queen conch underwater surveys, license and registration of fishers	Ministry of Agriculture and Fisheries Fisheries Division
	Water quality, soil samples (Pedro Banks), catches, vessel routes	Veterinary Service Division

	Water quality, biodiversity information, planning and zoning for aquaculture areas, quotas for trading species (CITES)	National Environment and Planning agency
	Socio-economic data	Jamaica Statistical Institute, Social Development Commission,
	Theses, fisheries resource information	University of the West Indies
Brazil	Catch and effort, biological, socio-economic data and export data	IBAMA, MPA (Ministry of Fisheries and Aquaculture), Public Universities and NGOs

Additional suggestions for themes to be included/ adapted in the IMS:

Marine-coastal biodiversity (new)

- Ecosystems (connected to the 3 x 3 matrix)
- Species
- Bilge water
- Invasive species
- Combat strategies for invasive species
- Management
- Organisations
- Research Centres

Organizations (revise)

Include national authorities to support generation of indicators, such as:

- Fisheries Departments/divisions
- Fishers
- Environmental agencies
- Private consultants
- Universities
- Local associates
- Coast guard
- Meteorological Institute or Department

Sustainable fishing strategies (new)

- Inventory of fishing fleet
- Agreements with the community groups
- Management of the various activities
- National and regional laws and regulations
- Entities from civil society that promote this sort of activities
- Good practice relating traditional knowledge and science
- Alternative livelihoods

Protected Marine-Coastal Areas and their effective management (new)

- Network of marine-coastal MPA's
- Representativity
- Efficiency of the management
- Management agreements

Strategies related to vulnerability and risks (new)

- Analysis of coastal risks
- Extreme events
- Climate change
- Coastal erosion

Groups and organisations related to fisheries (revise)

- Fishing statistics
- Statistics of not reglemented fishing
- Research

General comments

- Clarify abbreviations and acronyms
- Include mariculture
- Consider two presentations of the IMS main page: with themes such as now, or linked to the strategies of the SAP
- Certain issues should be combined, for instance: Environmental and Ecosystem Monitoring with Monitoring Programs
- Include the monitoring of the fisheries, artisanal as much as industrial, by-catch and non reported catch
- Establish a specific theme for fisheries that includes the various groups, such as of the pilot projects
- There should be links between the different components of IMS which would permit to connect them for a more effective search
- Generate agreements on the positions of foreign fishing fleets in the Caribbean.

ANNEX IV**Questionnaire LME Information Management System - IMS**

1. You had the opportunity to work with the beta version of the IMS and now we ask you to provide your suggestions on two aspects: 1) the user interface, and 2) the current contents

1)

2)

2. What should be the main objective(s) of the IMS?

3. How should the IMS be managed, centrally or decentralised?

4. How should the operation of the IMS be funded?

5. Which are the priority themes to be included in the IMS?

THANK YOU !

ANNEX V**Spanish questionnaire.**

1. Usted ha tenido la oportunidad de trabajar con la versión beta del IMS y ahora le invitamos a darnos sus sugerencias con respecto a dos aspectos: 1) el interface del usuario, y 2) el contenido actual

1)

2)

2. Cual(es) deberían ser el (los) objetivos principales del IMS?

3. Como cree Usted que el IMS debería ser manejado ? Centralizado o descentralizado?

4. Como se debería financiar la operación del IMS?

5. Cuales son los temas prioritarios por incluir en el IMS?

¡ MUCHAS GRACIAS !

