



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

CLME-IMS/REMP Workshop – Indicators for Decision Making Summary Report Deliverable D. 2.2

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 CLME-IMS/REMP Workshop Indicators for Decision Making held in Cartagena, Colombia, September 11 – 13, 2012. .



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

CLME-IMS/REMP WORKSHOP - INDICATORS FOR DECISION MAKING

(Cartagena, Colombia, September 11-13, 2012)

DRAFT SUMMARY REPORT

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1. WELCOME & OPENING

The meeting started on Tuesday 11 September 2012 at 9.15 h. In his opening speech, the project leader of the IMS/REMP project, Dr. Paul Geerders, welcomed the participants. He emphasized the importance of this meeting in the context of the IMS (Information Management System)/REMP (Regional Environmental Monitoring Program) project and its important role in the context of the CLME (Caribbean Large Marine Ecosystem) project.

The Head of the IOC-UNESCO Office for IOCARIBE, Dr. Cesar Toro also welcomed the participants. In his speech he briefly mentioned the background of the CLME project and the specific role of the IMS/REMP. In the context of the current workshop, he particularly emphasized the essential role of indicators for governance and mentioned the three categories of indicators that the Workshop should address: process indicators, stress indicators and status indicators. He referred to the corresponding documents made available to the participants. Moreover, he stressed the need to “change the rules of the game”, and invited the participants to be creative in their approaches. In conclusion of his welcome speech he wished the participants a successful meeting.

The agenda of the meeting is included in Annex I.

2. INTRODUCTION OF PARTICIPANTS

A round table introduction of the participants was held. Participating experts gave a brief introduction of themselves and the institution they are involved. The Workshop was attended by fourteen experts from seven countries in the Caribbean Region.

The full List of Participants is included in Annex II.

3. CLME, IMS & REMP INTRODUCTION

The project manager of the CLME project, Dr. Patrick Debels, presented the CLME project. He mentioned the background and history of the project, as well as the specific role of the Transboundary Diagnostic Analysis (TDA) and the Strategic Action Plan (SAP). The TDA's have led to the identification of the main problems and the main sectors hit by these problems.

The unique aspect of the CLME project and new for the region is the ecosystems-based approach, a holistic approach including elements of ecosystems, environment, and related issues such as socio-economy. The expectation is that with such an approach in

the form of a negotiated policy, governance will achieve lasting and sustainable results in the management of the shared living marine resources.

The project manager of the IMS/REMP project, Dr. Paul Geerders, presented an overview of the project, its background, history and objectives. From the beginning it was recognized that a dedicated provision of data and information would be an essential asset for governance. Nevertheless, data and information are scarce and scattered in the region, and therefore difficult to access. An Inception Meeting, held in November 2012, set the outline for the development and implementation of the IMS/REMP. The report of that meeting is available to the Workshop. The main objective of the IMS is to act as a lasting portal providing links to sources of relevant data and information on ecosystems, environment and related issues. The main objective of the REMP is to provide the IMS with data and information.

4. OBJECTIVES OF THE MEETING

The project leader IMS/REMP explained to the participants the objectives of the Workshop. In this context he referred to the earlier distributed document Guidelines for the Workshop, and to the GEF Manual on Indicators by Al Duda. Both documents focus on three types of indicators:

- Process indicators
- Stress indicators
- Status indicators

The participants were asked to focus in their work on all three types of indicators in a balanced way.

Combining the main problems identified with the main sectors in the region hit by these problems, this results in the “3 x 3 matrix” as follows:

	Coastal Fisheries	Reef Fisheries	Pelagic Fisheries
Contamination			
Habitat Change			
Over exploitation			

He presented the following Terms of Reference of the Workshop, formulated as tasks to be carried out by the participants:

1. Define a small set of indicators for each of the cells of the 3 x 3 matrix,
2. Discuss and evaluate the benefits of bringing together different types of data and information at the regional level (different disciplines and well as combining geographic areas) as a basis for the generation of the indicators defined, and in support of the provision of regional policy advice,
3. Consider the value of marine ecosystem goods and services region-wide, and generate some policy options for the inclusion of valuation in decision-making,
4. Develop some indicators for tracking the process of understanding the value of ecosystem goods and services,
5. Identify a small number of indicators to monitor the importance and performance of small scale fisheries at the regional level,
6. Identify reef complexes in the region with reef sea grass and mangrove in proximity, of a sufficient scale that they are worth protecting by MPA's, and probably are already protected,
7. For all indicators identified, identify sources of data and information that support the generation of these indicators, thus defining the role of the IMS & REMP in this context.

5. ESTABLISHMENT OF WORKING GROUPS

Mr. Geerders informed the plenary that during the Workshop, the participants will be divided in three working groups, focusing on a subset of the tasks identified above. Each working group will nominate a moderator and a secretary. The secretary will ensure that the results of the working groups will be presented to the plenary session and be included in the final report of the Workshop.

The participants were divided over three Working Groups as follows:

Working Group 1: Gladys Perez (Mexico), Evelyn Moreno (Colombia), Diana Arias (Colombia), Manuel Perez (El Salvador);

Working Group 2: Martha Vides (Colombia), Doug Wilson (USA), John Knowles (USA), Jorge Jaen (Panama), June Masters (St. Vincent & the Grenadines);

Working Group 3: Ana Maria Gonzalez (Colombia), Alejandro Acosta (USA), Suayapa de Meyer (Honduras), Gloria Batista de Vega (Panama).

Dr. Cesar Toro, Mr. Paul Geerders, Ms. Jacinthe Amyot and Mr. Tyler Wilson would switch between the various Working Groups.

Each of the Working Groups was asked to nominate a moderator and a rapporteur. The latter would be instrumental in providing the essential input to the Final Report of the Workshop.

The Working Groups were given specific tasks in relation to the above-mentioned ToR of the Workshop, as follows:

Working Group 1: tasks 1, 2, 7

Working Group 2: tasks 2, 3, 6, 7

Working Group 3: tasks 2, 4, 5, 7

6. REPORTS OF WORKING GROUPS

In order to provide a moment of adjustment and coordination, the rapporteurs of the three Working Groups provided the Plenary Session with an intermediate impression of their achievements. These were amply discussed and commented, as a basis for the further work of the Working Groups. Specifically the Working Groups were asked to ensure that they would provide a summary of their deliberations, jointly with their conclusions and recommendations to the final sessions.

Each of the Working Groups presented their findings to the Plenary.

Working Group 1:

Concerning **Task 1**: the group presented an extensive and detailed list of indicators for each of the cells of the “3 x 3 matrix”. As a summary they presented the following priority list of indicators:

- Levels of sedimentation
- Levels of toxic substances in the marine environment (organic and inorganic contamination)
- Changes in the spatial coverage of marine ecosystems
- Landings/catches from the populations of exploited fishing resources
- Changes in the population structure of the exploited species (size, maturity, etc.)
- Levels of fishing effort
- Levels of restoration/recuperation of ecosystems and species
- Living conditions of the fishing communities (work, health, income)
- Existence and/or adoption of various instruments (policies, management plans, programmes) and their application
- Regions for management and conservation
- Climate change (acidification, sea level, hurricane incidence)

For each indicator the Working Group provided a detailed description of the type of data required and suggestions for the possible sources of this data (**Task 7**). Their complete findings are included as Annex 3.

The Group presented the following general recommendations:

- To develop adequate mechanisms for social participation that allow access to information, as well as feedback and appropriation of the same by all users (with an emphasis on fishermen) of the coastal ecosystems of the Wider Caribbean region.
- To develop a common methodology for the definition and development of indicators to guide partners in the successful implementation of the relevant assessments. The need was stressed to adapt the indicator evaluation process to the specific characteristics of the various countries participating in the CLME project. Once defined the interventions of the Strategic Action Plan, SAP, it is recommended to provide feedback to the indicators.

In addition, some recommendations were made by Working Group 1 for the necessary strengthening of the institutional capacity of government entities, including:

- Provision of equipment for the entities in charge of providing the indicators,
- Provision of training on this issue of implementing bodies,
- Strengthening of the involvement of local communities in relevant training and in application of the indicators,
- Definition of the rights of information and individual and collective intellectual property rights (e.g. of ethnic groups),
- Establishment of transparent procedures for budget management,
- Promotion of shared funds for the budget destined to the application of indicators.

With the objective of strengthening for long term action, the following was recommended:

- Identification of actors in the community organised by the Government for the application of indicators (e.g. NGO's)
- Identification of actors in the organised communities to ensure the sustainability of the implementation of the indicators.

In response to **Task 2**, the Group concluded that this product is a very useful tool to make more accurate evaluations, allowing for a better informed decision-making in the context of the sustainable management of the marine resources of the CLME region, and allow the creation of a database that permits the permanent monitoring of the state of the marine coastal resources of the CLME area.

The complete findings of working group 1 are included as Annex III to this report.

Working Group 2:

Concerning **Task 2**: the group recognized that it would be of advantage to have the same data that can be assessed by anyone, including the academia. However, there is no immediate drive to change the present situation, and moreover resources are scarce.

The group identified a number of important specific issues to be considered in this context:

- standardisation of: policy processes, data collection methods, data formats, data submission, data delivery (e.g., WMS, but might vary between sources, data, sub-regions), tools for collection and viewing of data, participatory indicator identification is important, and thus buy-in to the indicators being used, buy-in could lead to regional acceptance by governments of information and support authoritative data sources, establishment of a regional baseline;
- challenges to standardization: regionally variable fishery practices and regulations
- challenges to implementation: upfront costs, lack of funding, priority for immediate local and national needs, limited capacity of skills (e.g., for database management, technical data collection), indicators are not as widely available as they should be, understanding of an IMS and REMP.
- decision making: authoritative, accurate, and standard information (maps, data) is key to making good decisions and must be made available to all, regional decisions are not being made at all and if they are, they are not completely supported by the monitoring and data that exists across the region.
- research and science should support the decisions required at the regional level for fisheries management, current research is not keeping pace or isn't happening, funding for this kind of research is not diversified, standard and objective methods and data/information products can be helpful and should be made available to regional researchers.
- on visualization and portal development: there is no need to develop another map viewer, a better approach is to collate other sources or have one dataset that other viewers consume.

In the context of these considerations, already some relevant examples can be mentioned. All regions have different ways of looking at and disseminating information, but FAO simplifies this. In the case of UNESCO indicators for Colombia, 33 indicators for establishing the state of marine and coastal ecosystem were pared down to 11 indicators.

For 15 years, Colombia has been producing a report on the State of the Marine Environment based on what they measure: does the fact that Colombia is already doing this help or hinder the integration? The fact that IOC-UNESCO is leading the IMS/REMP effort will help with integration. Single country efforts that are already ongoing might complicate integration. Colombia ranked low in the Ocean Health Index, Colombian Scientists asked why? OSPESCA (helping Panama and Central America Caribbean) and

CRFM (helping Caribbean countries) are both assisting with fisheries data: OSPESCA and CRFM just signed a MOU; they are already integrated at that level.

Concerning **Task 3**: The costs in the long term are often sacrificed for short term gains. Valuation is seen as a confused and complicated field of work. It was suggested to choose one standard valuation method for the whole region, possibly with a short-term and a long-term component; although it will not be perfect, but the results at least would be comparable across the region. Quality, consistency and continuity of information provision was considered to be of high importance, as well as surveillance and reinforcement of laws and regulations.

Concerning **Task 6**: the group identified various sources of information that could potentially help to identify the MPA's in question.

Concerning **Task 7**: the group identified a limited number of indicators for the 3 x 3 matrix, as well as potential sources for the data/information needed to generate the indicators.

In addition, the group identified as key issues of importance for IMS/REMP:

- capacity building in digital data/information management at institutional level
- willingness to share data and information under regional data policy
- involvement of local communities
- integrate with existing networks

The complete results of Working Group 2 are included as Annex IV to this report.

Working Group 3:

Concerning **Task 2**: At the regional level, standardized protocols are needed to allow for a standard approach to monitoring at all levels, using the same units, questions and methods. Moreover, access to the results of the monitoring should be improved. This would facilitate the provision of technical and legal support and would allow for a long term sustainable approach to management, as well as facilitate compliance with the various international conventions and agreements. Monitoring programmes should ensure continuity also after their initial project funding ends.

Concerning **Task 4**: In this context, the group considered a number of biological and socio-economic indicators, including: scuba surveys identifying the status of reefs, the status of the mangroves and carbon sequestration, the recruitment of important species, the protection for natural phenomena, presence of reefs as protection against impacts of tsunamis and hurricanes. Indicators might be dependent upon location, e.g. in more high risk locations. The group also mentioned that value isn't always (only) economic.

Concerning **Task 5**: The group suggested indicators such as: the number of people active in the small scale fisheries, demographic analysis of this group according to gender,

socioeconomic status, ethnic group, etc. Moreover they proposed as indicator the catch per unit effort, i.e. the real time spent fishing vs. the catch.

Concerning **Task 7**: The group identified potential sources including: government institutions, universities and research institutions, NGO's, and grey literature. Attention should be given to the potential loss of data and information, especially in universities. A region-wide mandatory sharing of data and information should be achieved through an agreed data policy.

The complete findings of working group 3 are included as Annex V to this report.

The group formulated the following recommendations:

- Identifying or creating repositories of information in permanent institutions of recognized prestige and responsibility, that comply with international standards.
- Access to online information using international standards. Developing a website that allows the search and acquisition of data. It is important that this information is organized geographically (georeferenced)
- Refer to existing protocols such as of GBIF (Global Biodiversity Information Facility) and IDABIN, for access and uptake of biodiversity information.
- Develop and strengthen mechanisms for the acquisition of data generated in the country under agreements or national and international research projects. Active participation of governments, institutions and individuals is the key to the establishment of an effective information network.
- Fisheries are an important factor but a wider multi-sectoral approach is recommended that includes topics such as: marine vegetation (algae, mangroves, pastures), invasive species, climate change, and traditional knowledge.
- Strengthen and provide existing information and which is common to the region. This information must be available at all levels from the fishermen and the general public to the resource managers and politicians.
- Existing information must be presented in a way easy to understand, and with a multidisciplinary approach that encompasses: scientific information, traditional knowledge of fishermen, ecological, socio-economic information and legal information.
- Proposals need to be discussed and approved by the relevant intersectorial committees of the countries involved.

7. SYNTHESIS

The project leader IMS/REMP noted that the participants mentioned data availability and data quality as important issues in relation to indicators. He reminded the participants that the relevance of these issues had been recognized from the beginning by IMS/REMP and are still considered as most relevant. For this reason, the current SAP under development includes specific proposals for interventions and activities related to these important issues.

He also explained that the IMS is meant to be a portal, not a database per se. It will contain references to sources of data and information in the form of links, or URL's. These could link into files or documents, but also to a person or organisation or entity (e-mail). The contributors will be responsible for the quality and maintenance of the references; for this reason, agreements will be made with these contributors.

In this context, IMS will use existing systems as much as possible, such as Ocean Docs (publications, grey literature) and Ocean Expert (expertise) of IOC/IODE, and GBIF and IABIN for biodiversity information. Also CCAD was mentioned as a valuable source of a variety of information, including satellite-derived.

The IMS/REMP project will not only identify indicators and data/information sources, but will also work on capacity building on management of data and information, especially at the local (institutions) level, and promote a CLME data policy as the basis for sharing of data and information.

8. CONCLUSIONS AND PROPOSED ACTIONS

The project leader IMS/REMP referred to the original Terms of Reference for the Workshop, as mentioned in the Considerations document as well as to the reports received from the three Working Groups. He noted with satisfaction that the Working Groups had produced much relevant and valuable result that will allow IMS/REMP to move forward. He noted that with respect to indicators, much work had been devoted to identifying indicators of status and stress, while considerable less indicators had been defined at the process level. For the latter category, additional work will be needed and be completed over the coming months. For this task, selected participants will be approached.

In addition, he invited the participants to inform IMS/REMP on specific cases or situations where outside help is needed to strengthen the data and information management processes within countries and institutions.

9. CLOSURE

The project leader IMS/REMP, Dr. Paul Geerdens, expressed his thanks to the participants for their work and valuable contributions. He commended their professional focus on the tasks given, in spite of the excellent weather and the attractive leisure environment provided by the Hotel Caribe and the city of Cartagena.

He thanked the Local Organizing Committee and the IOC of UNESCO IOCARIBE Sub-Commission staff for their hard work on the preparations for the Workshop as well as

during the event. He also thanked the translators for their valuable work, and commended the staff of the Hotel Caribe for providing an excellent working environment.

Dr. Cesar Toro, Head of the IOC-UNESCO Office for IOCARIBE, joined him in the various thanks. He had noted that still there is ample room for capacity building at institution level, and to build bridges from there towards national and regional levels. Concerning data and information he confirmed that it is essential to reach the data at the micro level, at the level of the communities. For IMS the major concern is to promote and facilitate data sharing, basically at all levels: government levels, academic institutions and the local communities. The basis prerequisite in this context is mutual trust. He finally noted that still some work would have to be done, in order to ensure the availability of a practical set of indicators ready for use in the following phases of the CLME project.

The CLME-IMS & REMP Workshop on Indicators for Decision Making was closed at 15:00 hrs at the Hotel Caribe, on Thursday 13 September 2012.

ANNEX I

AGENDA

DAY ONE – 11 September 2012			
Agenda Item	Description	Time	Documents
0	Register	08:30 - 09:00	
1	Welcome & Opening	09:00 - 09:15	
2	Introduction of Participants	09:15 - 09:30	
3	CLME, IMS and REMP Introduction	09:30 -10:30	CLME Summary PD Inc. Meeting Doc Inc Meeting Rep Brief CLME Web site
	COFFE BREAK	10:30 -11:00	
4	Objectives of the Meeting	11:00 -11:15	Indicators Group ToR. GEF Manual
5	Establishment of Working Groups	11:15 - 12:30	ToR
	LUNCH	12:30 - 14:00	
6	Working Groups	14:00 - 16:00	
	COFFEE BREAK	16:00 - 16:30	
6	Working Groups	16:30 - 17:30	
DAY TWO – 12 September 2012			
Agenda Item	Description	Time	Documents
7	Working Groups Briefing in Plenary	08:30 - 09:30	Report Recommendations and Conclusions
8	Working Groups cont.	09:30 - 10:30	
	COFFEE BREAK	10:30 - 11:00	
8	Working Groups cont.	11:00 - 12:30	
	LUNCH	12:30 - 14:00	
8	Working Groups cont.	14:00 - 16:00	
	COFFEE BREAK	16:00 - 16:30	
8	Working Groups cont.	16:30 - 17:30	Report Recommendations and Conclusions

DAY THREE – 13 September 2012			
Agenda Item	Description	Time	Documents
9	Report of Working Groups in Plenary	08:30 - 09:30	
9	Plenary discussion	09:30 - 10:30	
	COFFEE BREAK	10:30 - 11:00	
10	Synthesis	11:00 - 12:30	ToRs
	LUNCH	12:30 - 15:00	
11	Conclusions and proposed actions	15:00 - 16:00	Report Recommendations and Conclusions
12	Closure	16:00 - 16:15	

ANNEX II – LIST OF PARTICIPANTS

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ANNEX III

WORKING GROUP 1 REPORT

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- Gladys Pérez de la Fuente
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- Evelyn Paola Moreno Nieto

RESULTS

A. SUMMARY OF PRIORITY INDICATORS

1. Sediment levels
2. Levels of toxic substances in the marine environment (organic contaminants)
3. Changes in the spatial coverage of marine ecosystems
4. Landings / catches from commercial fish stocks
5. Changes in population structure of commercial species (size, maturity, etc.)
6. Fishing effort intensity
7. Extent of restoration / recovery of marine ecosystems and species
8. Standard of living of fishing communities (employment, health, income)
9. Adoption and implementation of management instruments (policies, management plans, programs)
10. Management and conservation areas
11. Climate change (acidification, sea level, hurricane frequency and intensity)

B. INDICATORS PRIORITIZED BY PROBLEMS

POLLUTION

Sediment levels

Data: Grading, suspended solids, sediment dynamics, nutrients, faecal and total coliforms, presence of mercury and BOD.

Sources: CAR'S, INVEMAR, monitoring and REDCAM, CARICOM.

Levels of toxic substances in the marine environment (organic pollution)

Data: Mercury, heavy metals and BOD

Sources: INVEMAR, monitoring and REDCAM, CARICOM.

HABITAT CHANGE

Changes in the spatial coverage of marine ecosystems

Data: GIS, satellite images, field survey of species, sizes and heights, and coverage measurement methodology in mangrove areas for corals.

Sources: Research Institutes and Universities.

Changes in population structure of commercial species (size, maturity, etc)

Details: Size, sp captured and maturity stages.

Sources: Monitoring, NGO fishing, fishing offices, Universities

Extent of restoration / recovery of marine ecosystems and species

Data: Areas of recovered, growth, mortality, coverage of new areas and species abundance and density.

Sources: NGO'S, CAR, research institutes, universities and government.

CLIMATE CHANGE

Data: acidification, sea level, hurricanes frequency and intensity

Sources: government, universities, research institutions, CAR

OVEREXPLOITATION

Landings / catch / stock yields of commercial fish

Data: quantities, volumes, sizes, species captured and maturity stages, catch per unit of fishing effort.

Sources: Office and Ministry of Fisheries, AUNAP, NGO'S.

Fishing effort intensity

Data: Number of fishing vessels, number of fishers, number of trips, number of fishing days.

Sources: AUNAP and fisheries offices.

TRANSVERSE PROCESSES

Standard of living of fishing communities (employment, health, income)

Data: income, employment, living standards indicators, illiteracy rates.

Sources: DANE census, urban observatories, registry offices and NGOs.

Existence and implementation of various management instruments (policies, management plans, programs)

Data: Number of environmental laws, institutions, plans, programs, projects, overall policy, among others. Review of actions taken by the institutions responsible for each instrument.

Sources: Public and private institutions at national, regional and local levels. Private organizations do not implement regulatory processes.

Areas where management and conservation plans were implemented

Data: List of management areas, characterization of biophysical and socio-economic components.

Sources: National Parks, Ministry of Environment, Civil Society

C. RECOMMENDATIONS

1. Develop participatory mechanisms that enhance access to the above information, and allows for feedback and appropriation by all users (with an emphasis on fishermen) of coastal marine ecosystems of the great Caribbean region.
2. Develop methodologies to guide the definition and development of indicators and support partners in the development of effective assessment practices.
3. Adapt the assessment process and choice of indicators to the various local conditions associated to each of the countries of CLME
4. Once interventions are defined by the strategic action plan (SAP), a feedback mechanism should be used to realize the adjustments needed for the use and development of indicators.

D. CONCLUSIONS

The IMS is a useful decision-making support tool for sustainable management of marine resources in the CLME. It provides the information necessary for a more accurate assessment of marine and coastal resources and allows for continuous monitoring.

E. RECOMMENDATIONS

Strengthening the institutional capacity of governments:

1. Equipment for the institution in charge of implementing the assessment of indicators,
2. Training in the art on the implementing agencies.
3. Include community in the capacity building processes and in the assessment of indicators
4. Define information rights and individual and collective intellectual property (e.g. ethnic groups).
5. Establish procedures for transparency in the development of budgets/ proposal management.
6. Promote shared funds for the budgets allocated for the use and development of indicators.

Strengthening for long-term action:

1. Identify local stakeholders organized by governments for the implementation of indicators (eg NGOs)
2. Identifying organized local stakeholders for the sustainability of the implementation process.

F. 3X3 MATRIX detailed indicators

The **green** indicators are transversal to all cells

Yellow indicators are both on the shoreline and in the reef

The indicators are **red** in both coastal and pelagic.

Type of fisheries ⇨	COASTAL	REEF	PELAGIC
Problem ⇩			
POLLUTION	<p>Status Indicators: Reduced coverage sea grasses, mangroves, algae, microalgae etc. Variation of the coastline. Decline in fish catch. Decreased eps. fishing. Presence of metal in living organism. Genetic modifications (sizes shapes number of juveniles, etc.) Loss of biodiversity. Frequency of red tides. Presence of invasive species. Amount of sediment. Presence of solid waste. Disposing of waste. Organic pollution and inorganic nutrients (microbial species, persistent organic pesticides).</p> <p>Contamination by toxic substances. (Hydrocarbons, heavy metals, pesticides, herbicides, acids). Total volume of untreated domestic wastewater. Liquid waste Self-purification capacity Presence of invasive species. Presence of metal in living organism. Genetic modifications. Population structure of the species. Loss of biodiversity. Algal blooms. Sedimentation.</p> <p>Stress Indicators Level of sedimentation. Changes in land use. Lost of Coral Using chemicals for fishing</p>	<p>Status Indicators: Lost fish productivity. Presence of area degraded. Regeneration capacity and reef restoration. Amount of coral lost per area.</p> <p>Stress Indicators: Type and recreation areas intended for this activity. Frequency of red tides. Coral areas for health</p>	<p>Status Indicators: Outcrop of micro algae etc. Presentation of mercury in living organisms Intoxication in humans Population structure.</p> <p>Indicators: Stress Hydrocarbon production levels. Conflict generated by different types of fisheries (Payload).</p> <p>Process Indicators: Number and extent of protected areas. Percentage of recruiting individuals per species. Costs of collection and treatment of water</p>

	<p>Conflict level generated by the types of recreational activities and associated zones Deforestation and erosion.</p> <p>Process Indicators: Number and extent of protected areas. Percentage of recruits per species. Costs of collection and treatment of water. Ecological zoning. Participatory mechanisms. Socioeconomic Indicators: # Of unemployed fishermen Poverty level Presence of digestive diseases Decreasing fish catch Decreasing fishing zone</p>		
	<p>Duration of fishing days. Changing traditional economic activity. No. of tourists Presence alternative livelihoods cultural loss Immigration levels Loss of property value Educational level Presence or absence of management tools and regulations Number of management studies and implemented plans Controls and monitoring. Presence or absence of legislation Compliance tools Percentage of budget spent on specific targets Cost of ecosystem restoration Diseases recovery costs Expenses in hours: containment and prevention of environmental risks. Investments in environmental recovery Investment in sewer system Investment in waste management Population growth Authorized and unauthorized urban settlements Increased no. industry with inadequate environmental practices. Lack of alternative sources of food and employment</p>		
	<p>Stress Indicators: Location of inadequate coastal infrastructure. Coastal modification Loss of mangrove Lost of fishing gear (ghost fishing). Variation of sea level. Increased temperatures.</p>	<p>Status Indicators Areas of coral that are lost each year</p> <p>Stress Indicators: Use of destructive fishing gear</p>	<p>Overexploitation pelagic (socioeconomic)</p>

<p>Habitat change</p>	<p>Intensity of hurricanes. Acidification Use of destructive fishing gear. Sedimentation levels. Decline in fish catch. Decreased of fisheries type.</p> <p>Status Indicators: Change in the communities structure. Resiliency level. Population structure Biodiversity loss associated to illegal fishing. Number of species classified on red lists (extinct, endangered, exotic, key or migratory). Decreased nesting beach habitat. Presence of invasive species. Mangrove areas that are lost per year</p>		
<p>Over-exploitation</p>	<p>Indicators: Change in community structures. Resilience Capacity. Population structure. Biodiversity decline form illegal fishing Stress Indicators: Abandoned or lost fishing gear (ghost fishing). By-catch and discards levels. Increased surveillance costs to combat Destructive fishing gear</p> <p>Process Indicators: Existence of plans of action to combat illegal fishing. # Of penalties for illegal fishing. Illegal fishing. Increased surveillance costs to combat Illegal fishing</p>		<p>Status Indicators Changes in the trophic structure of pelagic fish stocks</p> <p>Stress Indicators: Reduction of catch and fish yields</p>

ANNEX IV

WORKING GROUP 2 REPORT

Members:

- Martha Vides
- Doug Wilson
- John Knowles
- Jorge Jaén
- June Masters

Task 2. Assessment of the benefits of regional data/information integration

There are known direct and indirect benefits from both the collection and use of common regional information and datasets. For example:

DIRECT BENEFITS TO REGIONAL INTEGRATION

- Realizing the economies of scale for any data collection efforts and having the appropriate information available for decisions made at the regional level.
- Political divisions of the sea are arbitrary to how the ecosystem functions and thus how it should be managed.
- Incentives for all regional players to work together
- Quickly identify data gaps

POTENTIAL INDIRECT BENEFITS TO REGIONAL INTEGRATION

- Could support the sustainability of indicator collection and monitoring.
- Facilitation of regional ecosystem valuation from the tools and products developed
- Trends defined through analysis of sustained indicator monitoring will be more valuable than individual status values.

However, the integration of smaller datasets and information; and the implementation of regional data collection has some challenges to surmount. The benefits are known regarding this second point, but they are currently not overcoming the challenges easily. My simple observation is that Central America has some system/frameworks in place that are functioning at supporting decision making at the regional level. Building off of this existing network in Central America for the pelagic, reef and coastal fisheries the CLME Project is focusing on could be a good option. The regional system/frameworks for the insular Caribbean don't seem to be as functional. Supporting the capacity of these system/frameworks to become functional seems to be an appropriate option. Realizing the current nuanced status of where different sections of the wider Caribbean region

(WCR) are in terms of their IMS and monitoring might be necessary for building the CLME IMS and REMP.

Regardless of the next steps that are taken with the IMS and REMP, there are several common themes that will need to be considered. These themes are; STANDARDIZATION, CHALLENGES, DECISION MAKING, RESEARCH, VISUALIZATION AND PORTAL DEVELOPMENT and CASE STUDIES.

STANDARDIZATION OF

- Policy processes
- Data collection methods
- Data formats
- Data submission
- Data delivery (e.g., WMS, but might vary between sources, data, sub-regions)
- Tools for collection of data
- Tools for viewing data
- Indicators
 - o Participatory indicator identification is important, and thus buy-in to the indicators being used.
 - o Buy-in could lead to regional acceptance by governments of information and support authoritative data sources.
- Above will help with establishing a regional baseline

CHALLENGES

- To STANDARDIZATION
 - Regionally variable fishery practices and regulations.
- To implementation
 - Upfront costs
 - Lack of funding
 - Immediate local and national needs
 - The capacity of skills (e.g., for database management, technical data collection) are not always accessible or available to all governments in the region.
- Indicators are not as widely available as they should be.
- Understanding of an IMS and REMP. Examples of this might be needed when presenting this component of the project.

DECISION MAKING

- Authoritative, accurate, and standard information (maps, data) is key to making good decisions and must be made available to all.
- Regional decisions are not being made at all and if they are they are not completely supported by the monitoring and data that exists across the region

RESEARCH

- Research and science should support the decisions required at the regional level for fisheries management
- Current research is not keeping pace or isn't happening
- Funding for this kind of research is not diversified.
- Standard and objective methods and products can be helpful and should be made available to regional researchers.

VISUALIZATION AND PORTAL DEVELOPMENT

- There is no need to develop another map viewer, a better approach is to collate other sources or have one dataset that other viewers consume.

CASE STUDIES

- All regions have different ways of looking at and disseminating information, but FAO simplifies this. (STANDARDIZATION Example)
- In the case of UNESCO indicators for Colombia, 33 indicators for establishing the state of marine and coastal ecosystem was pared down to 11 indicators. (STANDARDIZATION Example)
- For 15 years, Colombia has been producing a report on the state of the marine environment based on what they measure. (BENEFITS)
- Does the fact that Colombia is already doing this help or hinder the integration? The fact that UNESCO is leading this effort will help with integration. Single country efforts that are already ongoing might complicate integration. (CHALLENGES)
- Colombia ranked low in the Ocean Health Index, Colombian Scientists asked why (INCENTIVE FOR CHANGE)
- OSPESCA (helping Panama and Central America Caribbean) and CRFM (helping Caribbean countries) are both assisting with fisheries data. (OPESCA and CRFM just signed a MOU; they are already integrated at that level). (INTEGRATION/IMPLEMENTATION)

Task 3. Policy options for inclusion of [economic] valuation in decision-making

As a contribution to the development of policy options for inclusion of valuation in decision-making, the group continued to list benefits of a CLME IMS/REMP and tried to list issues surrounding the theme of this task.

- When requesting funding, the IMS/REMP can be used to support how valuable certain projects are.
- IMS/REMP would support the comparison of the economics of certain datasets/issues/ecosystems across the region.
- IMS/REMP would provide the value for ecosystem services for both general master planning and during disaster management valuation.

- IMS/REMP must provide both SHORT- and LONG-TERM valuations (For use in Cost/Benefit Analyses). These require collection and availability of appropriate data sets.
- There should be a COMMON and ACCEPTED methodology based on data and information collected that values the services. To implement this, one has to have the "correct" [quality, consistent, continuity] information.
- It is noted that CULTURAL VALUE of a resource is difficult to enumerate. Employment within certain sectors and respect of certain cultures should also be considered. Over-exploited resources can impact the economy or cultural dependence on certain resources. In terms of vulnerability, the fisher folks are vulnerable.
- POLICY AND DECISION-MAKERS should be presented with multiple TOOLS and be able to select their preference in tools supporting decision making (find their comfort level).
- POLICY AND DECISION-MAKERS should be presented with [simple] data/information that directly impacts them and communicates the core of the issue.
- CASE STUDIES:
 - Colombia's Ministry of Environment has a decree that maintains the area of mangrove (no-loss). There are fines for when mangrove areas are lost. Looking at value to how costly it is lose mangroves and ensure fines are sufficient. Regulation is one thing, but enforcement and detection is another issue. There should be an incentive for surveillance if the fines are reinvested.
 - The reasons for the changes to traditional pelagic fisheries might be climate change related, which goes back to collecting the right data to predict this.
 - Ecological Structure - Biodiversity and Services - mapped for Colombia

6. Identification of reef complexes worth protecting or already protected by MPA's

The Workgroup listed particular examples or resources to find further information.

- Unit of Satellite Monitoring for ARAP has information about Panama
- TNC works with countries to help map the MPAs
- WDPA
- TNC eco-regional assessment on marine biodiversity
- CBD countries are responsible national ecological gaps
- CI has a priority layer
- Colombia has GEF project to assess marine protected areas
- MPAtlas
- CaMPAM
- GIS analysis to ID reef complexes
- Pete Mumby (ARC,AUS) work
- CATHALAC - has a map viewer.

- Coastal Zone Management/Environment/Planning Departments for participating countries need to be contacted

7. Sources of data/information to support the indicators identified

Table 1: 3 X 3 matrix

Problem	Type of fishery		
Indicators	Coastal	Reef	Pelagic
Pollution/Contamination	Water quality at specific points (chemical, physical, biological, heavy metals)	Water quality at specific points	Water quality at specific points
	Volume of solid waste	Volume of solid waste	Volume of solid waste
	Concentration of heavy metals	Concentration of heavy metals	Concentration of heavy metals
	Frequency of algae blooms	Frequency of algae blooms	Frequency of algae blooms
	Frequency of fish kills	Frequency of fish kills	Frequency of fish kills
	Presence of indicator species	Presence of indicator species	Presence of indicator species
	Land use	Land use	
		Lost of reef health	
	Presence or absence of regulation and enforcement	Presence or absence of regulation and enforcement	Presence or absence of regulation and enforcement

Over exploitation	Reduction of illegal fishing practices	Reduction of illegal fishing practices	Reduction of illegal fishing practices
	Presence or absence of regulation and enforcement	Presence or absence of regulation and enforcement	Presence or absence of regulation and enforcement
	Catch – CPUE	Catch – CPUE	Catch – CPUE
	Bycatch	Bycatch	Bycatch
	Stock assessment	Stock assessment	Stock assessment
	Recruitment	Recruitment	Recruitment
Habitat change		Loss of reef health	
	Fishermen unemployment	Fishermen unemployment	
	Measurement of ICZM implementation	Measurement of ICZM implementation	
	Change mangrove coverage	Change mangrove coverage	
	Extent of submerged	Extent of	

	vegetation	submerged vegetation	
	Mangrove health	Mangrove health	
	Coral reef health	Coral reef health	
	Sea level		
	Water temperature	Water temperature	Water temperatur e
	Acidification	Acidification	
	Illegal, unregulated and unreported fishing practices	Illegal, unregulate d and unreported fishing practices	
	Turtle nesting areas		
	Food chain dynamics	Food chain dynamics	Food chain dynamics
			Changes in circulation
Climate change	Fishermen unemploymen t	Fishermen unemploym ent	Fishermen unemploy ment

Table 2: Source and data type of each indicator from Table 1.

Indicators	Type of data	Source
Water quality at specific points (chemical,	chemical, physical, biological (coliforms)	REDCAM Network-INVEMAR GOOS

physical, biological)		
Volume of solid waste	Solid waste (oil, tar, lost fishing gear, plastic, glass, sediments)	Panama- Beach cleaning programme. Sand watch Programme Jamaica
Concentration of heavy metals	Living organisms (benthic and pelagic), sediments, water. Standards.	EPA
Frequency of algae blooms	Satellite images (extent), coast guards reports	NOAA
Frequency of fish kills	Record of events, estimation of number of kills	National fisheries departments, NGO's
Presence of indicator species	Species	
Presence or absence of regulation and enforcement		
Reduction of illegal fishing practices		
Catch – CPUE	Report (CPUE trend, increase observers in fishing service)	
Land use	Satellite imagery, national physical planning,	

	census,	
Bycatch	(knowledge gap)	Project GLOBAL-Duke University reports
Fishermen unemployment	Economic census	
Measurement of ICZM implementation	Strength of laws, fines, enforcement mechanisms	Coastal Zone Management plans per Environmental Coastal Units-Colombia. http://siam.invemar.org.co/indicadores/atlas_spincam_g2.jsp
Change mangrove coverage	Satellite imagery	CATHALAC, TNC
Extent of submerged vegetation	Surveys	TNC
Mangrove health	Indices	TNC
Coral reef health	Indices	TNC, HRI
Sea level	In situ, remote sensing	GLOSS
Water temperature	In situ, remote sensing	
Acidification	In situ	
Illegal, unregulated and unreported fishing practices	Plans (NPA) to combat IUU fishing	CRFM, ARAP Dirección Vigilancia y control, Fisheries office
Stock assessment	Survey data, catch and effort	CRFM
Turtle nesting areas		Sea Turtle Recovery Action Plan WIDECAS
Food chain dynamics	Chlorophyll	Fishbase
Changes in circulation	Modeling, observations	NOAA,

Additional considerations

The group was tasked with tying some of the concepts together and adding some detail to the role of IMS/REMP. One important aspect identified by this group was the issue of capacity. We thought building capacity on data/information management within institutions that participate in the policy cycles definitely is needed. In addition to this, there needs to be outreach to the local communities. Their perceptive and interest in the process is critical. Also, there needs to be links with existing networks whenever possible. At a policy level, there needs to be a data sharing policy, similar to ones set up for IODE, IOC and elsewhere. Critical to this is the trust needed for regional cooperation.

A concrete example where the above can play out is supporting the existing efforts of OSPESCA and CRFM the specific indicators that these networks are already working on. An interesting fact about the fishing industry across the region is that long line fishing is the only regional fishery. The other fisheries, although need management at regional levels, don't actually operate at the regional level.

Guidelines (minimum elements) to obtain those indicators (from a CRFM perspective)

- Strengthening co-management program to collect the data (community level)
- Help managers of data
 - Local, National, Regional Scope
 - No disaster recovery, improvements for this (Local/National)
 - Use local sources
 - Use only Excel or papers
 - Fixing databases
 - CRFM has old database that could be fixed (foxpro)
 - Recommendations for technological platforms
 - No central database
 - Pushing data to internet
- Sponsored pilot project (working with countries that are already streaming data over the internet such as those from Central America)
- ID Standard that can be used across regional level (regional)

Mechanism for how we are going to achieve that (what mechanisms are available)

- Transfer from hard copy information to digital information

Think about why certain approaches are not working, not always lack of money.

- Regulations for data collection are out of date

At the national level, in terms of fisheries data collection, the most basic form of data is already being collected: information on fishing vessels, information on fishers, and information about the catch (usually marine catch and effort). Other data that are needed

are biological data, economic and social data. We can improve what the countries are doing or we could extend what the countries are doing.

Specific interventions required/proposed:

- Fund boat census /frame survey at the national level of fishing boat and fishers (this would also indirectly capture number of fishers) then train the data collectors and managers to make them more effective at keeping the system current.
- Capacity building in management of data (getting the data into a database) and assisting in improving the database system that is used by the member states to store and manage the data. Member States currently are using Excel or database systems that need fixing or upgrading. These systems call into question the quality, consistency and continuity of the data that the countries provide. The bottom line is that thousands of valuable data points are totally lost each year as old systems crash, Excel sheets are corrupted and database systems (FoxPro) becomes obsolete.
- Bring other aspects of the system on board: biological data, economic and social data and aquaculture data and process socioeconomic data.
- Provision of technical support and consultants to facilitate the implementation of these interventions.

ANNEX V

WORKING GROUP 3 REPORT

Members:

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- Suyapa Triminio Meyer (Secretariat of Natural Resources, Honduras),
- Alejandro Acosta (Gulf Caribbean Fisheries Institute, Florida Fish and Wildlife Conservation Commission)
- Ana María González (Ministry of Environment and Sustainable Development, Colombia).

The analysis and the recommendations presented apply to biophysical topics (species and ecosystems), and to socio-economic aspects.

Task 2. Assessment of the benefits of the integration of data and information at the regional level.

The benefits of the integration of data and information at the regional level, allows to build the necessary technical and legal support for decision-making in management and conservation of resources at regional, national and regional level.

The integration of data allows to have updated information on the status of resources. It also enables/facilitates the development of long-term databases and allows for statistical modelling, such as dispersion, forecasts, projections, simulations and multisectoral.

Another benefit for the countries of the region is achieving compliance with and reporting commitments to international conventions, agreements and protocols such as CBD, SPAW Protocol, IWC, CIT, and others.

The harmonization of data generates efficiency and effectiveness in the development of monitoring programs and their follow-up, thereby reducing costs in economic terms and human talent.

Recommendations

1. General

- Standardization of data acquisition and processing.
- Unification of terminology, definitions, units of measure, procedures, will enable the comparison of the information collected from all countries with the same technical considerations.

- Exchange of information between the countries that are part of the network's programs of monitoring and follow-up.
- Identify, evaluate and adjust the protocols used by some countries, such as SocMon or protocols of FAO, to be adopted as standards for the region.

2. Financial sustainability.

The protocols for monitoring and surveillance that have emerged from various initiatives, sometimes do not achieve financial and technical sustainability and when the project is complete, do not have continuity. It is recommended that these programs are included in government budgets or identify a financial mechanism in the long-term that includes different sources to ensure their sustainability (fishing licenses, entry to protected areas, tax rates).

3. Governance

- It is necessary that there is responsibility for the implementation of monitoring and surveillance programmes, at the different levels of government (local, regional, national) as well as at the civil organisations
- Create mechanisms or instruments through which the NGO's and academic institutions (national and international) officially report the information acquired through their research, monitoring and surveillance programmes.

Task 4. Indicators to understand the value of eco-system based goods and services.

It is recognised that the valuation methods of ecosystem-based goods and services in the region are very diverse and depend on biophysical (habitats, quality) and socio-economic (type of use, degree of exploitation, culture) aspects, as well as on the country.

Biological Indicator	Importance
Density of juveniles in marine-coastal ecosystems (marine vegetation, coral reefs, bare sea floor).	Recruitment and growth of species in marine-coastal ecosystems. Permits to establish or assess populations in terms of supply in different time horizons.
Presence/absence of species of the different trophic levels of the marine-coastal ecosystems.	Determines the overexploitation of species of the higher trophic level. It is an indication of change in species. Indicator of changes in species diversity.
Production or fixed carbon by marine-coastal ecosystems (recommended).	Important because it is being explored in some countries as a tool for adaptation to climate change 'Blue Carbon'. Acts as income from the sales of carbon.

Socio-economic indicators	Importance
Coverage by marine-coastal ecosystems (km ² , Ha, linear kms). Number and extent of marine-protected coastal areas (different protection categories).	Capacity of ecosystems to withstand natural disasters (hurricanes, tsunamis, erosion)
Number of visitors who come to areas associated with marine-coastal ecosystems per year (beaches, reefs, marshes).	Recreational and tourist value of the resource
Evaluation of the perceptions of the community with respect to the condition of marine-coastal ecosystems.	Knowledge of the community concerning the resources in terms of conservation.
Revenues generated by mariculture and related activities	Changes in income from this activity and diversification of sources of income
Income generated by activities associated to marine-coastal resources.	Changes in terms of revenues for the communities.

Task 5. Indicators to measure the performance and importance of small-scale artisanal fisheries.

Indicator	Importance
Number of users involved in the activity (gender, age).	Importance of knowing the demographic structure dedicated to the activity (gender, age)
Number of communities involved in the activity (ethnic groups)	Generates information to develop training programs
Catch per unit of effort of fishing (fishing gear)	Allows an assessment of the amount of fishing effort
Traditional fishing income	Learn about the economic contribution from fisheries to the income of the inhabitants
Percentage of time spent on this activity	Allows to determine how much time is dedicated to these activities and plan time to be spent on other activities. When this activity is carried out.
Added value of the artisanal fisheries at the national level	Indicator of the economic contribution to the country's domestic income

Percentage contribution of fisheries to the development of the country	Contribution with added or derived activities from the fisheries (networks, transport, boats, marketing)
Change in levels of poverty	Importance of measuring changes in the level of well-being of the population

Task 7. Sources of data and information to support the identified indicators.

Sources of data and information necessary to support the generation of the identified indicators include:

1. National and international governmental level: DANE's Colombia, United States National Marine Services, Panama maritime authority, Institute of forest conservation of Honduras.
2. Academic / research (biological and socio-economic) international or national: national and international universities
3. Local level: fishermen cooperatives, environmental territorial entities
4. Level of NGOs and national and international agencies: CI, TNC, JICA, NOAA.
5. Maps, aerial and satellite images, geo viewers: NOAA, NASA, CATALAC, INVEMAR, DLR.
6. Official sites in cyberspace: there is a lot of information available online from different sources and different formats, from literature, databases, presentations, maps etc. Some examples are:
 - www.fishbase.com,
 - [www. healthyreefs.org](http://www.healthyreefs.org).
 - [www. gcif.org](http://www.gcif.org)
 - [www. oneplus.com](http://www.oneplus.com)
8. Grey literature: institutional reports, unpublished academic thesis.

RECOMMENDATIONS/CONCLUSIONS

1. General

- Identifying or creating repositories of information in permanent institutions and of recognized prestige and responsibility, which comply with international standards.
- Access to online information considering international standards. Developing a website that allows the search for and acquisition of data. It is important that this information is organized geographically (georeferenced).

- Refer to protocols of GBIF (Global Biodiversity Information Facility) and IABIN (database) for access and acquisition of biodiversity information.
- Develop and strengthen mechanisms for the acquisition of data generated in the country under agreements or within national and international research projects. It is understood that the active participation of Governments, institutions and individuals is the key to the establishment of an information network.
- It is recognized that fisheries is an important factor which requires a multi-sectoral approach that includes topics that have not had the required priority to be taken into account: marine vegetation (algae, mangroves, pasture), invasive species, climate change, traditional knowledge.
- It is important to strengthen and provide existing information, common to the region. This information must be available at all levels from the fishermen, the general public, the resource managers and politicians.
- Existing information must be presented in an easy to understand way and with a multidisciplinary approach that includes scientific information, traditional knowledge of fishermen, ecological, socio-economic information and legal information.
- This document is a working draft that reflects the professional views of the participants in this discussion group, coming from different areas of research, and does not represent official positions of country or agencies.
- All proposals must be discussed and approved by the different intersectoral committees of each of the countries.

2. Institutional Capacity Building

- Support institutions, corporations or governmental or non-governmental entities that have already worked in monitoring and surveillance programs, and have no guaranteed financial sustainability.
- Ensure that there is no duplication of economic or financial efforts.

3. Community Strengthening

- Empower communities, through the strengthening of confidence, in terms of knowledge, implementation of programmes for community monitoring and surveillance, with a true valuation of resources as a result. This could be achieved through training, generation of sustainable alternative livelihoods, improved practices of arts and methods for fishing that lead to sustainable fishing activity.
- Recognize the value and the application of traditional and local knowledge in the different processes within the monitoring and surveillance programmes.
- Promote, encourage and sponsor exchanges of local experiences.

Some examples:

- Annual invitations to fishermen to come to the GFCI.
- CamPAM
- local communities in the Colombian Pacific to monitor sea turtles

4. Information Transfer

- Human talent is needed, multidisciplinary trained in technological, social, economic and biological issues.

5. Indicators

- Indicators should be identified that are already established in different protocols (national level) and analyze which could be used or applied as indicators at regional level.

ANNEX VI

LIST OF ACRONYMS AND ABBREVIATIONS

ARAP	Autoridad de los Recursos Acuáticos de Panamá
CAR	Caribbean
CCAD	Comisión Centroamericana de Ambiente y Desarrollo
CATHALAC	Centro del Agua del Trópico Húmedo para América Latina y el Caribe
CLME	Caribbean Large Marine Ecosystem
CRFM	Caribbean Regional Fisheries Mechanism
EBM	Ecosystem Based Management
ESI	Ecosystem Status Indicators
GBIF	Global Biodiversity Information Facility
GEF	Global Environmental Facility
GFCI	Gulf and Caribbean Fisheries Institute
GIS	Geographic Information System
GOOS	Global Ocean Observing System
GLOSS	Global Sea Level Observing System
IABIN	Inter-American Biodiversity Information Network
ICZM	Integrated Coastal Zone Management
IMS	Information and Management System
INVEMAR	Instituto de Investigaciones Marinas y Costeras
IOC	Intergovernmental Oceanographic Commission
IODE	International Oceanographic Data Exchange
IUU	Illegal, unreported and unregulated fishing
JICA	Japan International Cooperation Agency
LMA	Large Marine Ecosystem
MPA	Marine Protected Area
MOU	Memorandum of Understanding
NASA	National Aeronautics and Space Administration (USA)
NGO	Non Governmental Organizations
NOAA	National Oceanic and Atmospheric Administration
NPA	National Plans to combat IUU Fishing
OSPESCA	Organization for the Fishing and Aquaculture Sector of the Central American Isthmus
REMP	Regional Monitoring and Environmental Framework
SAP	Strategic Action Programme
TDA	Transboundary Diagnostic Analysis

UNEP

UNESCO
WIDECAST

United Nations Educational Educational
Scientific and Cultural Organization
United Nations
Wider Caribbean Sea Turtle Network