

**WORKSHOP
TOWARDS INTEGRATED SUSTAINABLE MANAGEMENT OF
THE CARIBBEAN SEA: IDENTIFYING THE RESEARCH
PRIORITIES AND DATA GAPS**

Acknowledgements

This project was funded by the International Development Research Centre (IDRC).

Table of Contents

Contents	Page No.
Acknowledgements	
Table of Contents	
Executive Summary	
1.0 Introduction	
1.1 Programme	
1.1.1 Working Groups	
2.0 Knowledge Gaps and Information Needs	
3.0 Known and Required Capacity Building	
3.1 Required Initiatives for Capacity Building	
3.2 Initiatives to Support Science necessary for Capacity Building	
3.3 Known Initiatives	
4.0 Current Research Capacities and Planned Ongoing Initiatives	
4.1 General	
4.2 Specific	
5.0 Key Ongoing Initiatives	
6.0 Known Successful Initiatives	
6.1 Fisheries Initiatives	
6.2 Environmental Monitoring Initiatives	
6.3 International/ Regional Initiatives	
6.4 National Initiatives	
6.5 Initiatives showing Limited Success	
7.0 Institutional Measures Needed to Forge Integrated Management of the Caribbean Sea	
8.0 Emerging Issues	
9.0 Leaders Working in the Region	
9.1 Sustainable Caribbean Sea and Science	
9.2 Sustainable Caribbean Sea and Management	
9.3 Sustainable Caribbean Sea and Governance	
Appendix 1 Participant's Information	
Appendix 2 Programme	
Appendix 3 Working Groups	

Executive Summary

On the 10th – 11th March 2008, the Cropper Foundation conducted a workshop to formulate a research agenda for the Caribbean Sea, which would support policy and decision-making for integrated sustainable management of the Caribbean Sea as set forth by the latest UN Resolution¹. The workshop responded to a call for targeted efforts in research of the Caribbean Sea as identified in a previous Caribbean Sea assessment. This first assessment – dubbed CARSEA (Caribbean Sea Assessment) - was completed as part of a global programme known as the Millennium Ecosystem Assessment (MA) in September 2006.

The participants of the workshop were divided into three groups based on their areas of expertise. Working group 1 focused on Sustainable Caribbean Sea and Science: Fisheries, Ecosystems, Oceanography, Marine Chemistry; Working group 2 focused on Sustainable Caribbean Sea and Management: Coastal Zone Management, Pollution (land and maritime), Shipping, Yachting, Information Management and Dissemination; Working group 3 focused on Sustainable Caribbean Sea and Governance: Institutional, Legal, Policy and Business. Participants were asked to contribute by way of identifying:

- research and knowledge gaps;
- existing work on the Caribbean Sea;
- information and information sources available for management of the Caribbean Sea;
- persons and organisations working with the Caribbean Sea;
- persons and organisations that are leaders in the region

The report is presented in eight sections.

1. Knowledge gaps and information needs
2. Known and required areas for capacity building – initiatives to support the science necessary for capacity building were identified.
3. Current research capacities and planned ongoing initiatives – More than a third of the activities ongoing in the Caribbean Sea have no planned or ongoing initiatives.
4. Key ongoing initiatives
5. Known successful initiatives – Initiatives were identified in a number of areas including fisheries, environmental monitoring, international, regional and national initiatives.
6. Institutional measures needed to forge integrated management of the Caribbean Sea
7. Emerging Issues
8. Leaders working in the region

¹ RES/61/197. Towards the sustainable management of the Caribbean Sea for present and future generations

The knowledge gaps and recommendations outlined in this report are intended to be used by persons interested in working towards sustainable management of the Caribbean Sea. The information provided allows one several entry points to approach sustainable management of the Caribbean Sea.

1.0 Introduction

An assessment of the Caribbean Sea has been completed as part of a global programme known as the Millennium Ecosystem Assessment (MA). The assessment identified several gaps in the information and knowledge base relating to the Sea, and has recognized a need for more coordinated and targeted efforts (including research) to support sustainable management of the Sea.

In response, The Cropper Foundation with funding from IDRC conducted a workshop titled '*Towards Integrated Management of the Caribbean Sea: Identifying research priorities and data gaps*'. The overall goal of the workshop was to initiate the formulation of a research agenda for the Caribbean Sea, which would support policy and decision-making for integrated sustainable management of the Caribbean Sea as set forth by the latest UN Resolution

The Workshop brought together experts (refer to **Appendix 1** for contact details) working in various capacities in work related to the Caribbean Sea. These include participants from research institutions, non governmental, regional as well as key government representatives from throughout the Wider Caribbean Region. This report highlights the outcomes of the workshop which was held at the Cascadia Hotel and Conference Centre, Trinidad and Tobago on the **10th -11th March, 2008**.

1.1 Programme

Presentations and working groups were utilised in this workshop; refer to **Appendix 2** for the Programme.

1.1.1 Working Groups

In order to identify the research needs among others, participants were assigned to the working groups (refer to **Appendix 3** for group members) and a number of questions were posited to the groups. These are as follows:

1. Major knowledge gaps and information needs in your thematic area.
2. An assessment of the current research capacities where known (such as local, institutional, national, regional), and also any planned or ongoing initiatives to incorporate Caribbean Sea related research.
3. Leaders (not present at this consultation) in the region working within your thematic area.
4. Known successful initiatives
5. What legal and institutional measures are necessary to support the science?
6. How current and planned initiatives can be supported by science?
7. What are the implications for Investment/co-operative action? (How can we use the Caribbean Sea as an investment)

8. Known and/or required capacity building mechanisms/programmes for data and information, for example GIS and organised database

Three thematic areas were assigned so as to allow experts to contribute within their specific area of research or work. The working groups were

1. Sustainable Caribbean Sea and Science;
2. Sustainable Caribbean Sea and Management;
3. Sustainable Caribbean Sea and Governance.

Outcome of the Workshop

2.0 KNOWLEDGE GAPS AND INFORMATION NEEDS

1. **Economic valuation, especially for regulating, socio-cultural and supporting services**- Economic valuation can put a ‘dollar value’ to these services, and such valuation would be useful and even necessary to inform and in some cases drive policy decisions. Additionally, economic valuation gives these services ownership or property rights, which allows for incorporation into the market system.
2. **Ecological and environmental indicators for measuring ‘resilience’ and sustainability** – Ecosystems behave in such a way that they assimilate pressure without seemingly without any effect until a threshold is reached beyond which the ecosystem collapses. Ecological and environmental indicators are necessary to ensure that the thresholds are not breached, and that ecosystems are utilised within the limits of this threshold.
3. **Social indicators** – The UN has developed social indicators for development, however these need to be assessed regularly to determine how the Caribbean Region is performing based on the indicators, and also to redesign and develop new social indicators where necessary.
4. **Continuous monitoring of key indicators** – Monitoring is an important component of the success of any program, particularly where the program is continuous. Societies and ecosystems change with time and thus it is important that key indicators of these be monitored to determine how the indicators need to be modified or replaced to maintain effectiveness.
5. **Quantification of the thresholds of core ecosystem functions** – Ecosystem functions are factors that enable the ecosystem to maintain itself and evolve. The thresholds of ecosystem functions – the limits beyond which the ecosystem function ceases – need to be quantified using scientific methods, to determine the activities that can be conducted that do not breach thresholds of core ecosystem functions.

6. **Decision support and trade-off analysis. -????**

7. **Cost-Benefit analysis of cruise ship tourism on island economy & environment** – Tourism accounts for 14.8% of the Caribbean region’s GDP and provides 2.4 million jobs. In spite of the benefits the costs associated with cruise ship tourism cannot be ignored. These costs include clean-up of solid wastes, and loss of marine organisms such as coral reefs. Cost-benefit analyses need to be done to ensure that major economic and ecological losses do not occur due to tourism.

8. **Effectiveness of existing coastal zone management initiatives** – Assessment needs to be undertaken to determine if existing coastal zone management initiatives are effective, and if not, the measures that can be undertaken to ensure the success of these initiatives.

9. **Long term data collecting, administration & sharing for coastal management???**
10. **GIS merchant vessel tracking system & monitoring???**

11. **Port baseline data on coastal & inshore biota (BWM)** – Coastal and inshore biota need to be assessed to determine their presence or absence and their population sizes, as these would influence any management plan or policy for ballast water management. Any existing data on coastal and inshore biota should be utilised and updated where necessary.

12. **Convert IMO model BWM course to Spanish???**

13. **Regional group of Caribbean countries needs to be developed for unified reporting of adequate reception facilities (for MARPOL V Special Area designation** – The Wider Caribbean Sea is designated a Special Area under MARPOL V; however special area requirements do not yet exist for the region.

14. **Pollution risk assessment & sensitivity mapping for the region** – Assessment and mapping needs to be undertaken for the region and where it has already been done, information needs to be compiled and made available to all decision-makers in the Wider Caribbean Region.

15. **Develop metrics for oil spill readiness assessment** – The Caribbean Sea is an important food source for many inhabitants of the Caribbean Region and any threats to this resource must be efficiently and adequately dealt with. Oil spills are a major threat in the Caribbean Sea, and mitigation measures must be available to deal with these spills if or when they occur.

16. **Develop a PSSA for the area of the Meso-American Reef off of Belize** – A Particularly Sensitive Sea Area (PSSA) is an area that needs special protection through action by IMO because of its significance for recognized ecological or socio-economic or scientific reasons and which may be vulnerable to damage by international maritime activities. Although the Mesoamerican Reef is in fairly good condition, the region is under constant danger from unsustainable fishing practices, global warming and pollution.
17. **Data on the number of yachts entering ports** – the Caribbean ecosystem, like any other ecosystem, has a carrying capacity and if the number of users exceeds the carrying capacity of the marine ecosystem, it will collapse. A system needs to be devised to record and distribute information on the number of yachts entering ports, to ensure that the carrying capacity is not breached.
18. **Develop consistent policy/enforcement in regards to pleasure craft regulations (not the same as merchant ships)** – also applies to other activities regarding the Caribbean Sea. – Currently no laws exist for leisure boats such as yachts and the same laws that govern large merchant vessels govern leisure boats. Legislation need to be created specifically for leisure boats as their impacts on the marine ecosystems are different to large merchant vessels.
19. **Establish adequate reception waste facilities for yachts** – Waste facilities currently exists; however, these are in need of upgrade and are not adequate for the number of boats. Waste facilities are needed for both sewage wastes from boats as well as garbage.
20. **Develop net worth/competitive analysis for pleasure craft industry???**
21. **Compliance- conditions (inclusive incentives)???**
22. **Rights based management to fisheries (esp. Small scale)** – Rights based management would enable individuals or groups to have access to the fishery through use rights. Use rights would restrict who has access to the fishery, it limits the fishing effort that each participant has, and it limits the catch one can take. Rights to the fishery offer the benefit of less exposure to the actions of others, less economic risk, and more stable expectations concerning catch and management.
23. **Have we identified all the ecosystem services of the Caribbean Sea?** – The conceptual framework links ecosystem services with human wellbeing, so it is imperative that all ecosystem services be identified within the region to ensure that human well-being is maintained.
24. **To what extent have we been able to accurately value the ecosystem services provided?** – Ecosystem services, particularly cultural services, are often difficult

to value universally because valuation in this respect is usually personal. Translating personal values into monetary value is one way of determining a universal value of the ecosystem service.

- 25. Does existing international law allow us to truly capture economic rents for ecosystem goods and services within EEZs? - ????**
- 26. Do we have effective existing legal frameworks and institutional arrangements for governance of the full range of ecosystems services and complex settings encountered in the region, bearing in mind the realities of SIDS in general and complexities of Caribbean SIDS in particular????**
- 27. How do we address the need to communicate with policy makers in a manner that is mindful of their political imperatives? ???**
- 28. What are the drivers/values that may influence political will?????**

3.0 KNOWN AND REQUIRED AREAS FOR CAPACITY BUILDING

3.1 Required Initiatives for Capacity Building

1. Need to establish an alliance of the social, economic and natural scientists.
2. Need for mechanism to facilitate data sharing for regional-scale analyses. In this regard, the participants recognized the important role of central databases, as well as ensuring that parallel national databases are harmonized.
3. FAO and CRFM Working Groups should provide in situ capacity building.
4. Formal, general training is also provided through the regional universities and through training scholarships provided by CRFM and other regional initiatives
5. Research programmes should have a capacity building component with resource management integrated.
6. Communication and Information
 - a. Establishment of common communication protocols.
 - b. Implementation of basic information facilities.
 - c. Definition of “common language” for interchange of data/information.
 - d. Quality control protocols definitions.
 - e. Agreements to consolidate networks for sharing information.
 - f. Definition of “usable” information (action papers-concepts-reports).
 - g. Determine appropriate data and information sharing systems given the complexities of the region.
 - h. Need to ensure appropriate access to existing information through effective pathways.

- i. Standards/systems for streamlining flows of information to optimize performance.

3.2 Initiatives to Support Science necessary for Capacity Building

- a. All major initiatives should seek opportunities to include research to address the full range of ecosystem services, besides provisions services.
- b. Develop a strategy to identify science policy needs.
- c. Create advisory groups.
- d. Embed scientists in decision making circles.
- e. Embed politicians in scientific circles.
- f. Establishing of “clinics” to analyze real-life problems where science and policy meet to find solutions (healing).
- g. Need for a formal process for focusing and utilizing science by the researchers.
- h. Need a decision-making forum that utilizes the science.
- i. Science must be demand-led.
- j. There must be a “science leader” to take the information “up the chain”.

3.3 Known initiatives

1. Efforts of CRFM to broaden its fisheries research and assessment approaches to address the full range of management objectives. For example ERAEF and introduction of the use of decision support tools.

4.0 CURRENT RESEARCH CAPACITIES AND PLANNED ONGOING INITIATIVES

4.1 General

1. Capacity for research both at the national and regional levels is limited. Most agencies/institutions are involved in basic applied research. An analysis is therefore required to determine current levels of capacity, as well as capacity strengthening needs.
2. Most research institutions/organizations focus on research on provisioning services, e.g. UWI, IMA/UTT, CRFM, FAO/WECAFC, and CFMC. At the national level, marine institutions usually have monitoring programmes that provide useful information on the supporting services.

4.2 Specific Areas

Activity	Status/comments	Ongoing or Planned Initiatives
Remote Sensing and GIS	Needs improvement from local and national to regional levels.	SST for the region (IMA), IWCAM project, ODINCARSA, CATHALAC/ SERVIR
Oceanography	Needs improvement from national to regional levels. Capacities for oceanography are different from country to country. Cost is high to develop regional level capacity.	UNEP RAC Caribbean Sea Assessment, IWCAM
Coastal Processes	Needs improvement from local to national levels. Few sites in some countries are actually monitored.	Beach Profile Monitoring (Eastern Caribbean), CARICOMP (mangrove, sea grass and coral reef monitoring), Coral Reef Monitoring for Climate Change (CARICOM countries)
Biodiversity	Needs improvement from local to national level.	National biodiversity inventories (CBD)
Fisheries	Needs improvement at all levels.	
Social and Economic Science	Needs improvement at all levels.	
Policy and Planning	Needs improvement at the national level. Needs more bilateral agreements.	
Legal Frameworks	Needs improvement at the national level.	
Maritime Safety and Security	Needs improvement from local to national level	GloBallast Partnerships, Regional Oil Spill Response Training, Regional Oil Spill Exercise/Drill, MARPOL V Seminars

5.0 KEY ONGOING INITIATIVES

- **CRFM** (Caribbean Regional Fisheries Mechanism) – CRFM is a network of stakeholders in the Caribbean Region that works to promote sustainable use of fisheries and aquaculture resources among themselves. CRFM is currently undertaking research and development projects in the areas of aquaculture, mariculture, and conflict resolution among multiple resource users. More information is available at http://www.caricom-fisheries.com/main/about_us.asp.
- **MarGov** (Marine Resource Governance in the Eastern Caribbean) Project – MarGov Project is undertaken by CERMES (Centre for Resource Management and Environmental Studies) and has the aim of understanding governance related to small-scale fisheries and coastal management in the Eastern Caribbean. The project is expected to be completed in February 2011. More information is available at http://www.cavehill.uwi.edu/cermes/margov_profile.html.
- **CLME Project** (Caribbean Large Marine Ecosystem Project) – The aim of CLME Project is promote and work towards sustainable management of the marine and shared resources of the Caribbean LME. The project builds upon existing projects, initiatives and national action programmes that focus on sustainable coastal and marine management. The project is coordinated by CERMES and involves 25 GEF (Global Environment Facility)-eligible countries of the Wider Caribbean Region. More information is available at http://cavehill.uwi.edu/cermes/clme_eng.html.
- **OECS SoG ???**
- **CFP&R** (Common Fisheries Policy and Regime) – CFP&R is an ongoing initiative that has the aim of sustainable management of the living marine resources and ecosystems of the Caribbean region through strengthened cooperation and collaboration and harmonized regional management of shared resources. Management will work within the framework of the revised treaty of Chaguaramas and other international agreements such as UNCLOS (United Nations Convention on the Law of the Sea). More information is available at [http://www.caricom-fisheries.com/website_content/publications/documents/Towards_a_Common Fisheries Policy and Regime.pdf](http://www.caricom-fisheries.com/website_content/publications/documents/Towards_a_Common_Fisheries_Policy_and_Regime.pdf) .
- **Climate change ???**
- **CANARI** (The Caribbean Natural Resources Institute) – CANARI is an independent technical and research organisation, which analyses and promotes the participatory management of natural resources in the islands of the Caribbean.

CANARI's programme is structured around three core elements: research (to gather knowledge), analysis (to use this knowledge in creation of policies), advocacy (promotes policy throughout Caribbean region). More information is available at <http://www.canari.org/prog.html>.

- **UNEP - CAR/RCU** (Caribbean Regional Coordinating Unit of the United Nations Environment Programme) – The body addresses the protection and development in coastal areas of the Caribbean. The Caribbean Environment Programme (CEP) is managed by CAR/ RCU, and has the aim of promoting regional cooperation for the protection and development of the marine environment of the Wider Caribbean Region. Three main sub-programs of CEP are AMEP (Assessment and management of environmental pollution), SPAW (Specially Protected Areas and Wildlife) and CETA (Communication Education, Training and Awareness). CAR/ RCU also partners with international bodies like ICRAN (International Coral Reef Action Network) whose coverage includes eradicating poverty and promoting socio-economic development. More information is available at <http://www.icran.org> ; <http://www.cep.unep.org/>.

Additional Comments:

Capacities are high in some disciplines (marine sciences of some countries) but weak in socio-economic, governance, legal (for ocean governance) at all levels within the English speaking Eastern Caribbean. There exists a need to identify the core capacities needed (particularly within CARICOM, but in the wider Caribbean in general) and at which levels. Gaps between research sector and business sector need to be addressed to allow for true understanding of capacity availability in the private sector.

The participants posed an open-ended question: Are there policy/governance lessons to be learned from successful national or transnational companies in the Caribbean (Goddard's, CLICO, Sol, and Sagicor)?

6.0 KNOWN SUCCESSFUL INITIATIVES

6.1 Fisheries Initiatives

- **FAO database** (fisheries data) –FAO has created a fisheries database that provides basic data and analytical transformations on the production of capture fisheries and aquaculture. The database allows users to mix and match data of interest. The database can be accessed at <http://faostat.fao.org/site/339/default.aspx> .
- **WECAFC** (Western Central Atlantic Fisheries Commission) – A regional fisheries body of FAO that undertakes activities in the following areas fisheries assessment and management; capacity building; technology/knowledge transfer; coordination and liaison with regional and international institutions and

programmes/projects. More information is available at <http://www.fao.org/fishery/rfb/wecafo> .

- **CARICOMP** (Caribbean Coastal Marine Productivity Programme) – CARICOMP is a regional scientific effort to study land-sea interaction processes to monitor for change and to provide appropriate scientific information for management. Since its inception in 1982, twenty-nine marine laboratories, parks and reserves in 13 islands and 9 mainland countries have joined CARICOMP. More information is available at http://www.ccdc.org.jm/caricomp_main.html
- **CTA** (Technical Centre for Agricultural and Rural Cooperation ACP-EU) – CTA is an ACP-EU institution working in the field of information for development. In the 24 years that CTA has been in existence it has been successful in launching several publications including Spore (CTA’s flagship magazine) and Agritrade (focuses on ACP agricultural trade issues); and the launch of its 4 year strategic plan which aims to improve CTA’s efficiency and increase its outreach. More information is available at <http://www.cta.int/> .

6.2 Environmental monitoring Initiatives

- **CCCCC** (Caribbean Community Climate Change Centre) – CCCCC has been successful as an information centre providing information on all aspect of climate change that affect the region. Additionally, CCCCC has facilitated a number of community projects, engaged in joint programmes with academic, regional and international bodies, and conducts monitoring through environmental scanning to identify threats. More information is available at <http://caribbeanclimate.bz/news.php> .
- **CPACC** (Caribbean Planning for Adaptation to Climate Change) –CPACC has been successful in raising awareness of the potential impacts of climate change, and has laid the groundwork, in institutional and technical terms, for the implementation of climate change and adaptive strategies in the Caribbean. More information is available at <http://www.oas.org/macc/Docs/MACC-BRO.pdf> .
- **MACC** (Mainstreaming Adaptation to Climate Change) – MACC is the successor to CPACC, and it aims to integrate climate change and variability into agendas of tourism, agriculture, fisheries and infrastructure sectors. More information is available at <http://www.oas.org/macc/Docs/MACC-BRO.pdf> .
- **CEP** (Caribbean Environmental Programme) – CEP has a number of projects and activities under its three main sub-programmes – AMEP (Assessment and Management of Environmental Pollution), SPAW (Specially Protected Areas and Wildlife), and CETA (Communication, Education, Training and Awareness). These projects are at different stages and have shown some success. More information is available at <http://www.cep.unep.org/> .

(National to be inserted)???

6.3 International/Regional Initiatives

- **IWCAM** (Integrated Watershed and Coastal Area Management Project) – The IWCAM project has not yet been completed. However, the project has shown success in terms of the favourable response it has drawn from its participants and the wider Caribbean Community. Also, as part of preparation for the project 13 national reports were developed on integrating watershed and coastal area management in various islands. More information is available at <http://www.iwcam.org/> .
- **UNEP/CEP** (Coastal Zone Guidelines) – Technical Report???
- **GIWA** (Global International Waters Assessment) – GIWA has produced three regional assessments for the Caribbean Sea: Caribbean Sea/Small Islands – GIWA Regional assessment 3a; Caribbean Sea/Colombia & Venezuela, Central America & Mexico – GIWA Regional assessment 3b, 3c; and Caribbean Islands – GIWA Regional assessment 4. More information is available at <http://www.giwa.net/> .
- **CLME** (Caribbean Large Marine Ecosystem Project) – CLME is not yet complete. Partnerships at the national, regional and international level with civil society, the private sector, governments, agencies and organizations are considered essential success parameters for the CLME Project. More information is available at http://cavehill.uwi.edu/cermes/clme_eng.html . – **Have any partnerships been formed???**
- **OECS** (Organisation of Eastern Caribbean States) Solid and Ship Generated Waste Project – the project aims to reduce the amount of garbage generated, and improve the collection and disposal of such garbage and of ship-generated pollution. The project has been successful in developing programmes and updating laws for waste management. More information is available at <http://www.oceansatlas.org/unatlas/uses/uneptextsph/wastesph/2596carib.html> .
- **GloBallast Partnership Project** - The project was aimed at assisting developing countries in implementing measures to minimize the adverse impacts of aquatic invasive species transferred by ships in ballast water. The first phase of the GloBallast project ran from 2000 – 2004 and was largely successful particularly in developing co-operative regional agreements between neighbouring countries for ballast water management. More information is available at <http://globallast.imo.org/MTE%20report.pdf> ; http://www.imo.org/about/mainframe.asp?topic_id=1018&doc_id=4841 .
- **OPRC** (Oil Pollution Preparedness, Response and Cooperation) Caribbean Island Regional Response Plan???

6.4 National Initiatives

- National Environmental Policy For Oceans, Coasts and Islands – Colombia??
- **National Coastal Zone Management Plan** – These plans exist for several Caribbean countries for example Belize and Barbados. Under these plans countries can preserve and enhance their marine areas; protect coral reefs and beaches.
- **Bilateral agreements** – Many bilateral and regional agreements exists between and among countries of the region. Countries benefit from these agreements through greater trade opportunities, financial and technical assistance and a larger global voice. More information is available at www.acs-aec.org/Trade/Statistics/2004/Trade%20Agreements%20CARICOM.xls .
- **Multilateral agreements** – Meso-American Barrier Reef Programme (see above)

6.5 Initiatives showing limited success.

- **CFRAMP** (CARICOM Fisheries Resource Assessment and Management Programme) – CFRAMP contributed significantly to the improvement of fisheries management capacity in the CARICOM region; it provided improved knowledge of the state of stocks in the region; it demonstrated the need for and feasibility of a Regional Fisheries Management Mechanism (RFM); and it supported work on the structure and responsibilities of a RFM as a successor mechanism to CFRAMP. More information is available at <http://www.sidsnet.org/successtories/3.html> ; Mr. Lennox Hinds (lennox_hinds@acdi-cida.gc.ca).
- **OECS FU???**
- **UNEP/RCU???**
- **IOCARIBE**
- **WIDECAST**
-

7.0 INSTITUTIONAL MEASURES NEEDED TO FORGE INTEGRATED MANAGEMENT OF THE CARIBBEAN SEA

1. Need for integrated research networks, e.g. MPAs in the region to be used as a research tool.
2. Implement the numerous regional and internationally agreed/adopted instruments (treaties and conventions).

3. Establish regional agreements to address common management concerns in an integrated way, e.g. environmental and fisheries.
4. More Incentives (tax deductions)
5. More scholarships for education
6. Establishment of “free trade zones” for research (scientific parks)
7. Finance and support for south-south trans-national projects
8. Need an institutional framework that will allow the product of research to be effectively implemented.
9. Given that there is an absence of alternatives there needs to be a better “coupling” between the Universities (supply) and the policy direction (demand).
10. More institutional measures and complementing legal measures.
11. Need to forge more effective relationships among organizations rather than creating more organizations.
12. Legal measures for access to science may need improving (maybe in the first instance for publicly funded work).

8.0 EMERGING ISSUES

1. Possible investment options, e.g. carbon sequestration and trading, and trading in amenity value.
2. Need to **promote and the** sea and the Caribbean region as a highly valuable region (Complex environment/social/economical interactions).
3. Establish long term programs with short and mid term defined outputs.
4. Accountability.
5. Corruption free establishment.
6. Institutional-civil society enhanced relationship.
7. Consultation and public involvement.
8. Research into incentive regimes and property regimes for sustainable management.
9. Need to determine relevant types of investment mechanisms.
10. Determine economies of scale and the institutions that could be scaled up.
11. Cost recovery mechanisms need to be in place that allows science to be properly utilised/ funded.

9.0 LEADERS WORKING IN THE REGION

9.1 Sustainable Caribbean Sea and Science

- **SIECA** (Central American Economic Integration System) – SIECA is a technical and regional organisation constituted as a legal entity which main function is to assist technically and administratively the Central American economic integration process. More information is available at <http://www.sieca.org.gt> .
- **OSPESCA** (Organisation of Fishing and Aquaculture of Central America) – OSPESCA promotes the coordinated development and management of regional activities of fisheries and aquaculture. One of the organisation’s main functions is to develop and promote strategies, programs, projects, agreements or regional conventions on fisheries. More information is available at <http://www.sica.int/ospesca/> .
- **CFMC** (Caribbean Fisheries Management Council) – CFMC is a regional council established under the US Sustainable Fisheries Act. The council is responsible for the creation of management plans for fishery resources in waters off Puerto Rico and the US Virgin Islands. Since 1991, CFMC has developed management plans for several species including the spiny lobster, shallow water reef fish, coral and queen conch. More information is available at <http://www.caribbeanfmc.com/> .
- **CCCCC** (Caribbean Community Climate Change Centre) – CCCCC’s role is to coordinate responses and support people of the Caribbean as they address the impact of climate variability and change on all aspects of economic development. The Centre is recognised globally as the focal point for climate change issues in the Caribbean. More information is available at <http://caribbeanclimate.bz/>; <http://www.caricom.org/jsp/community/ccccc.jsp?menu=community> .
- **CCA** (Caribbean Conservation Association) – CCA facilitates the development and implementation of policies, programmes and practices, which contribute to the sustainable management of the region’s natural and cultural resources. CCA is currently managing, or serving as the Implementing Agency for several programmes which include The Caribbean Regional Environmental Programme (CREP), SPAW Protocol and the Coastal and Marine Management Programme (CaMMP). More information is available at <http://www.ccanet.net/> .

9.2 Sustainable Caribbean Sea and Management

- **The Nature Conservancy** – the Conservancy is currently helping to preserve the Caribbean’s land and seascapes. The Nature Conservancy currently Works in the Eastern Caribbean, Dominica, Jamaica and the Bahamas. More information is available at <http://www.nature.org/wherework/caribbean/> .
- **The Ocean Conservancy** – the Conservancy focuses its efforts in four main areas; restoring sustainable American Fisheries; Protecting Wildlife from Human Impacts; Conserving Special Ocean Places; and Reforming Government for

Better Ocean Stewardship. More information is available at <http://www.oceanconservancy.org/site/PageServer?pagename=home> .

- **IOCARIBE** (International Oceans Commission: Sub-Commission for the Caribbean and Adjacent Regions) - IOCARIBE is responsible for the promotion, development, and coordination of IOC (International Oceans Commission) marine scientific research programmes, the ocean services, and related activities in the Caribbean and adjacent regions. More information is available at <http://ioc3.unesco.org/iocaribe/about.html> .
- **Meso-American Barrier Reef Programme** – the programme was created by the Nature Conservancy and works to identify and preserve protected areas in the whole MAR (Meso-American Reef) region; promote sustainable management practices; strengthen alliances and regional capacities; and support policy development. The programme has thus far implemented projects in four countries – Mexico, Belize, Guatemala and Honduras. More information is available at <http://www.tncmar.net/> .
- **Country Cooperation Agencies**
 - **Sida** (Swedish International Development Cooperation Agency) – In Central America and the Caribbean, Sida focuses its efforts on achieving democratic participation in political processes, a stronger constitutional state, less corruption, better housing and urban environments and sufficient growth to reduce poverty, particularly in rural areas. More information is available at <http://www.sida.org/> .
 - **CIDA** (Canadian International Development Agency) – CIDA provides assistance to the Caribbean through a Caribbean Regional Programme supports the development agenda established by the CARICOM member countries to achieve regional integration. More information is available at <http://www.acdi-cida.gc.ca/index-e.htm> .
 - **JICA** (Japan International Cooperation Agency) – contributes to human resources development and nation building in Central America and the Caribbean, and prioritizes cooperation in several areas including environmental conservation, health and hygiene and disaster prevention. More information is available at <http://www.jica.go.jp/english/> .
 - **USAID** (United States Agency for International Development) – the Caribbean Regional Programme was developed to focus on the two most daunting challenges facing the region – the challenge to compete in the open markets and the challenge to control HIV/AIDS. Currently USAID is developing a LAC Regional Environment Programme which will focus on conservation of biodiversity. More information is available at http://www.usaid.gov/locations/latin_america_caribbean/ .
- **UNEP/RCU** (Coral Reef Unit) – RCU is helping to lead international effort to save the planet's threatened coral reefs including those in the LAC region. It works actively with international partners around the world in a concerted effort

to reverse coral reef degradation and to increase international, national and local support for coral reef conservation and sustainable use. More information <http://coral.unep.ch/> .

- **WRI** (World Resources Institute) - is an environmental think tank whose mission is to move human society to live in ways that protect Earth's environment and its capacity to provide for the needs and aspirations of current and future generations. The four priority areas of WRI are people and ecosystems; climate, energy and transport; market and enterprise; and governance and access. More information is available at <http://www.wri.org/> .
- **UWI** (The University of the West Indies) – CERMES falls under the umbrella of UWI and is currently making strides with its MarGov Project. More information is available at <http://www.cavehill.uwi.edu/cermes/> .
- **OAS** (Organization of American States) - OAS is the region's principal multilateral forum for strengthening democracy, promoting human rights, and confronting shared problems such as poverty, terrorism, illegal drugs and corruption. More information available at <http://www.oas.org/> .
- **IMO** (International Maritime Organization) – the main task of IMO has been to develop and maintain a comprehensive regulatory framework for shipping and its remit which includes safety; environmental concerns; legal matters; technical co-operation; maritime security; and the efficiency of shipping. More information is available at <http://www.imo.org/> .
- **CCA** (Clean Caribbean & Americas) – CCA's main objective is to enhance the capability to promptly and efficiently respond to marine oil spills in the region. CCA is the leader in oil spill response in the LAC and South American regions. More information is available at <http://www.cleancaribbean.org/> .

9.3 Sustainable Caribbean Sea and Governance

- **CLI** (Caribbean Law Institute) – CLI is an associate institution of CARICOM, and its purpose is principally to relieve legal constraints to trade, commerce and investment and also to further clarify the laws affecting trade, commerce and investment in the region. More information is available at <http://www.caricom.org/jsp/community/clic.jsp?menu=community> . Winston Anderson???
- **UWI/SEDU** (Sustainable Economic Development Unit) – SEDU aims to contribute to the understanding of sustainable development through rigorous, regional research and the dissemination of such research results. More information is available at <http://sta.uwi.edu/sedu/>, and contact is Dennis Pantin Dennis.Pantin@sta.uwi.edu .

- **CTO** (Caribbean Tourism Organisation) – CTO creates and manages the partnerships necessary to increase the purchase of travel to and within the Caribbean that results in sustainable economic and social benefits for the people of the Caribbean region. More information is available at <http://www.onecaribbean.org/> .
- **WIDECAST** (Wider Caribbean Sea Turtle Conservation Network) - WIDECAST's objectives are to provide the Wider Caribbean governments with updated information on the status of and recommendations for management of sea turtles in the region. Additionally WIDECAST aims to promote a regional capability to implement scientifically sound sea turtle management and conservation programs. More information is available at <http://bycatch.env.duke.edu/about/Collaborators/WIDECAST> ; www.widecast.org .

Appendixes

Appendix 1: Participant's Information

Name	Designation	Institution/Organisation	Contact Info	Areas of Expertise
Dr. John Agard	Lecturer	Department of Life Science, The University of the West Indies, St. Augustine	Mobile: 777-0860 Email: johnagard@yahoo.com	
Dr. Francisco Arias-Iaza	General Director	Invemar, Cerro De Punta Betin Camino Del Puerto Santa Marta, DTHC Colombia	Phone: (57) 315 751 4786 Fax: (57) 431-2975 Email: farisis@invemar.org.co	Coastal zone management; Institutional – Civil society relations for sustainable use of coastal and marine resources; Scientific institutions management.
Dr. Daryl Banjoo	Environmental Chemist	Institute of Marine Affairs Hill Top Lane, Chaguaramas, POBox 3160, Carenage Post Office, Trinidad	Phone: (868) 634 4291/4 ext 302 Fax (868) 634 4433 Email: dbanjoo@ima.gov.tt	Environmental monitoring and assessment of water and sediment quality; hydrocarbon analysis; oil finger printing.
Dr. Jesús Beltrán Gonzalez	Director	Carretera del Cristo # 3, Casablanca. Municipio Regla. La Habana Cuba	Phone: (537) 862 4387 (537) 870 2864 Email: beltran@cimab.transnet.cu jbeltranspecial@gmail.com	Pollution (land and maritime); coastal zone management; land-base sources of pollution.
Ms. Gina Carvalho	Administrator	Yachting Services Association of T&T	Tel: 634-4938	
Mr. Bisessar Chakalall	Senior Fishery Officer	FAO Subregional Office for the Caribbean, UN House, Marine Gardens, Christ Church, Barbados	Tel: (246) 426 7110 ext 249 (246) 262 2025 (cell) Fax: (246) 427 6075 Email: Bisessar.chakalall@fao.org	Natural resource management – fisheries; fisheries governance; regional cooperation; livelihood approach to fisheries management and development; Sustainable use of fisheries through implementation of FAO Code of Conduct for Responsible Fisheries.
Dr. Owen Day	Director	Buccoo Reef Trust, Cowie's Building Carnbee Junction, Carnbee, Tobago	Phone: (868) 635 2000 Fax: (868) 639 7333 Email: o.day@buccooreef.org	

Name	Designation	Institution/Organisation	Contact Info	Areas of Expertise
Ms. Simone Dieffenthaler	Programme Officer	The Cropper Foundation Fernandes Industrial Compound, Laventille, T'dad	Phone (868) 626-2628 Fax: (868) 626 – 2564 Email: sdieffen@thecropperfoundation.org	
Dr. Lucia Fanning	Director	Marine Affairs Program Dalhousie University Kenneth C. Rowe Management Building, 6100 University Avenue, Suite 2127 Halifax , Nova Scotia CANADA B3H 3J5	Phone 902-494-8390; FAX 902-494-1001 lfanning@dal.ca	
Dr. Steven Freeman	Managing Director	Applied Marine Sciences Ltd. B2-15 Cascade River Gardens, Cascade Main Road, Cascade Port of Spain, Trinidad W.I.	Tel: 868 621-3902 Fax: 868 621 3902 E-mail: sfreeman@am-sciences.com	
Ms. Keisha Garcia	Consultant	The Cropper Foundation Fernandes Industrial Compound, Laventille, Trinidad	Phone (868) 626-2628 Fax: (868) 626 – 2564 Email: kgarcia@thecropperfoundation.org	
Dr. Judith Gobin	Lecturer	Dept. of Life Sciences, University of the West Indies, St. Augustine Campus, Trinidad	Tel: 868 374-7569 or 868 662-2002 (2046) Fax: 663 5241 JudithGobin@sta.uwi.edu	
Dr. Charmaine Gomes	Sustainable Development Officer	UNEP ECLAC 1 Chancery Lane, PO Box 1113, POS	Tel: 623-5595 Fax: 623-8485 Neil.Pierre@eclac.org	
Dr. Mark Griffith	Senior Programme Officer	Regional Office for Latin America and the Caribbean Ave Morse, Edificio 103, Ciudad Del Saber, Clayton, Panama PO Box 03590-0843, Ancon, Panama	Phone: (507) 305 3145 Fax: (507) 305 3105 Email: mark.griffith@pnuma.org	
Mr. Gideon Hanumansingh	Journalist		Ktelevision@gmail.com	
Dr. Floyd Homer	President	Sustainable Livelihood Trust # 7 Latoria Drive, Roystonia Couva	Phone: (868) – 687-5979 Fax: (868) 636 7496 Email: fmhome@sunbeach.net	About 20 years experience in natural resource management, including assessments, planning and programme development, training and technical assistance.

Name	Designation	Institution/Organisation	Contact Info	Areas of Expertise
Dr. Wayne Hunte	ProVice Chancellor	Research, University of the West Indies, St Augustine Campus, University of the West Indies	Phone: 645-3943 Fax: 663 – 7741 Email: pvcresearch@admin.uwi.tt wayne.hunte@sta.uwi.edu	
Ms. Nina Lysenko	Director	Directora de Conservación y Manejo de Recursos Costeros y Marinos. Secretaría de Estado de Medio Ambiente y Recursos Naturales Calle Presidente González esq. Av. Tirantes, Edificio La Cumbre, Ens. Naco. Santo Domingo, República Dominicana	Phone (809) 732 – 3305 (809) 501 – 2730 Fax: (809) 566-6042 ninalysenko@gmail.com costeromarin@medioambiente.gov.do	Coastal Marine Management; Marine Ecosystems Research.
Ms. Sarika Maharaj	Programme Officer	The Cropper Foundation Fernandes Industrial Compound, Laventille, Trinidad	Phone (868) 626-2628 Fax: (868) 626 – 2564 Email: smaharaj@thecropperfoundation.org	
Mr. Ben Maharaj		Institute of Marine Affairs P.O. Box 3160 Carenage Post Office	Tel: 634-4291 ext 519 Fax: 634-4433 bmaharaj@ima.gov.tt	
Dr. Robin Mahon	Professor / Director	Centre for Resource Management and Environmental Studies (CERMES), University of the West Indies, Cave Hill Campus, Barbados	Phone 246-417-4570, Fax: 246-424-4204 Email: rmahon@caribsurf.com	
Dr John Marr	Executive Director	Perry Institute for Marine Research , 100 North US Hwy 1,Suite 202 Jupiter, Florida 33477	Tel: (561) 741-0192 ext 110; (561) 373 – 4498 Fax: (561) 741 0193 Email: jmarr@perryinstitute.org	Marine Research: Coral Reef Resource Management, Fisheries Assessment, Community Outreach, Science/ Education Programme Management, and Laboratory Facilities.
Dr.Patrick McConney	Lecturer	Centre for Resource Management and Environmental Studies, The University of the West Indies, Cave Hill	Phone: (246) 417- 4725; (246) 424- 4204	

Name	Designation	Institution/Organisation	Contact Info	Areas of Expertise
Mr. Sheldon McDonald	Legal Advisor	Association of Caribbean States, Association of Caribbean States 5-7 Sweet Briar Road P.O Box 660 Port of Spain, Trinidad and Tobago	Tel: (868) 622-9575 Ext: 236 Fax: (868) 622-1653 Email: smcdonald@acs-aec.org	
Mrs. Sarah McIntosh	Executive Director	Caribbean Natural Resources Institute, Administration building, Fernandes Industrial Compound, Laventille, Trinidad	Phone: (868) 626-6062/682-1416 Fax: (868) 626 1788 Email: sarah@canari.org	Research into and promotion of participatory natural resource management in Caribbean Islands. Programme areas: climate change; forests and livelihoods; coastal and marine governance and livelihoods; communications research (in the area of natural resource management).
Mr. Peter A. Murray	St Lucia (1625)	OECS ES DU Morne Fortune PO Box 1383, Castries	Tel: 758-452-2537 Fax: 758-452-2194 Email: pamurray@oecs.org	Fisheries stock assessment; Fisheries management and policy; strategic planning; environmental law and policy.
Mr. Sean Padmanabhan	GIS Specialist	The Institute of Marine Affairs, Hilltop Lane, Chaguaramas, Trinidad	Tel: 634-4291 ext 405 Fax: 634-2479	
Mr. Neil Pierre	Director	UNEP ECLAC 1 Chancery Lane, PO Box 1113, POS	Tel: 623-5595 Fax: 623-8485 Email: Charmaine.Gomes@eclac.org	
Mr. Bruce Potter	President	Island Resources Foundation, 1718 P Street NW, Suite T-4 Washington, DC 20036 USA	Phone: 1-443-454-9044 Fax: 1-202-232-0748 Email: bpotter@irf.org	Policy; MPA Management; Environmental Information, NGO Management; Environmental Outreach.
Dr. Arthur Potts		Centre for Marine Sciences, UTT, C/o The Institute of Marine Affairs, Hilltop Lane, Chaguaramas, Trinidad	Phone: 868-634-4291- 4 Ext 502 (O)... Cell# 868-750-5735 (M) Fax: 868-634-4433 Email: arthur.potts@gmail.com arthur.potts@utt.edu.tt	
Commander Jeffrey Ramos	IMO Consultant	RAC/REMPEITC-Carib Seru Mahuma z/n Aviation and Meteorology Building, Curacao, NA	Tel: (5999) 839-3718 Fax (5999) 868-4996 Email: jmramos@attglobal.net	Assists the Caribbean in responding to pollution events in the marine environment.

Name	Designation	Institution/Organisation	Contact Info	Areas of Expertise
Mr. Maurice Rawlins	Program Assistant	The Cropper Foundation Fernandes Industrial Compound, Laventille, Trinidad	Phone (868) 626-2628 Fax: (868) 626 – 2564 E-mail: mauricerawlins@yahoo.com	
Dr. Judy Rocke		Centre for Marine Sciences, UTT, C/o The Institute of Marine Affairs, Hilltop Lane, Chaguaramas, Trinidad	Phone: 868- 634-4291 Ext 543 (O) Fax: (868) 634- 4433 Email: jfrocke@ima.gov.tt	Project management; geography; teaching/ lecturing; fishing industry.
Mr. Winston Rudder	President	The Cropper Foundation Fernandes Industrial Compound, Laventille, Trinidad	Phone (868) 626-2628 Fax: (868) 626 – 2564 Email: wrudder@thecropperfoundaton.org	
Dr. Tim Shaw	Director	Institute of International Relations. University of the West Indies, Trinidad	Tel (868) 469 0715 Fax (868) 663 9685 Email: timothy.shaw@sta.uwi.edu	
Mr. David Simmons	Consultant	92A Benjamin St. New Yalta, Diego Martin	Tel (868) 637-4925;789-8923 Email: dasimmons@mail.tt	International Law/ Law of the Sea; Waste management (solid and liquid); and Governance.
Dr. Asha Singh	Consultant	The Cropper Foundation Fernandes Industrial Compound, Laventille, Trinidad	Phone (868) 626-2628 Fax: (868) 626 – 2564 Email: asingh@thecropperfoundation.org ; ashasing@yahoo.ca	
Dr. Susan Singh-Renton	Programme Manager, Research and Resource Assessment	Caribbean Regional Fisheries Mechanism Secretariat 3 rd Floor Corea’s Building, Halifax Bldg, St. Vincent and the Grenadines	Tel : 784-457-3474 Fax No.: 784-457-3475 E-mail: singhrenton@vincysurf.com	Responsible for coordinating CRFM projects and activities in fisheries research and resource assessment. Current areas of research focus are population biology and ecology, and assessment methodologies suited to CRFM data situations.
Mr. Gerald Thompson	Director, Treaties	Ministry of Foreign Affairs	Tel: 625-9040 Fax: 627-0571 E-mail: thompson@foreign.gov.tt	

Appendix 2: Programme

DAY 1 - Monday 10th

Morning 08:30 to 12:30

Welcome Remarks
President of The Cropper Foundation
Mr. Winston Rudder

Remarks
On behalf of the Principal UWI, St Augustine Campus
Dr. John Agard

Presentation
The Caribbean Sea Ecosystem Assessment –What science is telling us
Dr. John Agard

Presentation
Sustainability and the Caribbean Sea - A SIDS Focus
Dr. Asha Singh

Break

Presentation
Large Marine Ecosystem– Highlighting the needs
Dr. Robin Mahon

Presentation
Marine Governance in the Caribbean
Dr Patrick McConney

Presentation
Research Needs for Resolving Maritime Disputes: A Caribbean Perspective
Mr. Gerard Thompson

Discussion

Introduction of Participants

Outline of format for the working groups

Lunch

Afternoon 2:00 to 6:00

Working Groups Discussion

Plenary Discussion

Closure of Day One

Closure of Day One

DAY 2 - Tuesday 11th

Morning 8:30 to 12:30

Opening of Day Two and Outline of the Program

Presentations on Assessments and Agreements which have implications for the Region

Millennium Assessment

Ms. Keisha Garcia

The Revised Treaty: Implication for the Caribbean Sea

Dr. Mark Griffith

Working Group Presentation

Break

Plenary Discussion on the Priorities for Research

Lunch

Afternoon 2:00 to 6:00

Presenting the Research Priorities of the Region

Discussion

Outlining the Way Forward

Closing Remarks

Mr. Winston Rudder

Appendix 3: Working Groups

Group 1: Sustainable Caribbean Sea and Science: Fisheries, Ecosystems, Oceanography, Marine Chemistry

Dr. John Agard
Dr. Daryl Banjoo
Mr. Bisessar Chakalall
Ms. Keisha Garcia
Dr. Judith Gobin
Dr. Charmaine Gomes

Dr. Wayne Hunte
Dr. John Marr
Dr. Authur Potts
Dr. Judy Rocke
Dr. Susan Singh-Renton

Group 2: Sustainable Caribbean Sea and Management: Coastal Zone Management, Pollution (land and maritime), Shipping, Yachting, Information Management and Dissemination

Dr. Francisco Arias
Dr. Jesús Beltrán Gonzalez
Ms. Gina Carvalho
Dr. Floyd Homer
Dr. Asha Singh

Ms. Nina Lysenko
Commander Jeffrey Ramos
Mr. Sean Padmanabhan

Group 3: Sustainable Caribbean Sea and Governance: Institutional, Legal, Policy and Business

Dr. Lucia Fanning
Dr. Mark Griffith
Mr. Ben Maharaj
Robin Mahon
Mr. Sheldon McDonald

Mrs. Sarah McIntosh
Dr. Patrick McConney
Mr. Peter A. Murray
Dr. Bruce Potter
Dr. David Simmons