Intergovernmental Oceanographic Commission
Training Course Reports

22

First IOC/IOCARIBE-UNEP Training Course on Monitoring and Control of Shoreline Changes in the Caribbean Region

Port-of-Spain, Trinidad and Tobago, 21-30 July 1993

SC-93/WS-59

UNESCO

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1. INTRODUCTION

The Intergovernmental Oceanographic Commission (IOC) has repeatedly recognized the importance of coastal zone as of particular interest for urban, industrial as well as tourism activities. These activities are originating more and more stress on the coastal environment; this implicates that a knowledge and management of the coastal zone are essential, particularly in the case of island countries where a major part of human settlements and resources are related to coastal zones and the ocean.

Taking into account the above approach, the Sub-Commission for the Caribbean and Adjacent Regions (IOCARIBE) developed, in the general context of the IOC/OSNLR Programme, a regional project on "Global Change and Coastal Land Loss: Management and decision-making for a sustainable development for the Caribbean and Adjacent Regions". As a first step for this project, an "Ad hoc" Experts Consultation was convened in Cartagena, Colombia (10-12 August, 1992). This Consultation proposed the organization of a Training Course entitled "Control and Monitoring of the Coastal Zone Changes in the Caribbean Region" to be performed in an English-speaking country of the area.

This Training Course was organized in Port-of-Spain, Trinidad and Tobago, 21 - 30 July, in close collaboration with the Secretariats of IOC and IOCARIBE and the Institute of Marine Affairs (IMA), Trinidad and Tobago. Financial support from IOC and UNEP carrying 22 participants has been completed by one fellowship provided through the International Sea Grant Programme and an air ticket offered by the French Embassy in Caracas (Regional Scientific Cooperation). The Course was addressed to geomorphologists and specialists in coastal zone management working or intending to work in the future in national/regional institutions.

2. PARTICIPANTS

Through a first announcement dated 1 March 1993 and a second one dated 19 April 1993, all national IOC/IOCARIBE focal points for IOC/IOCARIBE in the relevant countries of the Caribbean region were invited to present candidates for the course.

The selection criteria for such a course were:

(i) The existence of study programmes in the candidate's institution, related to the IOCARIBE/OSNLR programme;

(ii) The interest demonstrated by the candidate to present a case study of his country, related with the objectives of the course.

(iii) A sufficient knowledge of the Spanish and English languages.

The final selection of participants was carried out by the IOCARIBE Secretariat. The list of participants is included as Annex III

3. INSTRUCTORS

The main instructors of the course were:

- Dr. Kenneth Atherley, CCPU, Barbados
- Dr. Jorge Foyo, Instituto de Oceanología, Cuba
- Dr. Malcolm Hendry, MAREMP, U.W.I., Barbados
- Dr. Robert Thieler, Duke University, USA

During the course, a strong support was also provided by IMA's Scientists, specially in the framework of the field trips and during computer training.

4. COURSE PROGRAMME

The final programme of the course (Annex I) was decided during the meeting convened the day before the course (Wednesday, 21 July) at IMA. Dr. Avril Siung-Chang as IMA representative, Dr. Malcolm Hendry as instructor, and the scientists of IMA involved in the course, participated in this meeting. The mentioned meeting also facilitated checking the necessary technical infrastructure (Secretariat, meeting rooms, computers room, slide projector, field trips, daily transports from hotels to IMA, lunch, coffee). The course was conducted in the English and Spanish languages.

4.1 OPENING

Dr. Lennox Ballah, Director of the IMA, welcomed the participants and the instructors. He emphasized the importance of the coastal zone, specially for the Caribbean countries where a major part of the population is settled. Then, he stressed the interest to join our efforts in view of studying coastal zone-related topics aiming at a more efficient management. He concluded with the official opening of the training course and wished great success to the participants.

Dr. Georges Vernette, IOC Consultant for IOCARIBE presented the course programme in the context of IOC/IOCARIBE activities and related international programmes, in particular the UNEP Caribbean Environment Programme, and in the light of the UNCED-92 objectives. Dr. Malcolm Hendry, Senior Lecturer of the UWI (Barbados), complemented this information with the presentation of the IOCARIBE/OSNLR proposal - entitled "Global change and coastal land-loss: Management and decision-making in support of sustainable development within the Caribbean and Adjacent Regions", which is in the framework of the present and future activities within the Caribbean coastal zone, developed by IOC/IOCARIBE.

Dr. Avril Siung-Chang, Principal Research Officer at IMA, gave relevant information on the administrative arrangements and general organization of the Course.

4.2 PROGRAMME

4.2.1 Presentations

During the course, presentations were given on the following topics:

(i) Coastal geomorphology;

(ii) Coastal process-response systems and Coastal evolution, with special emphasis on Caribbean illustrations;

(iii) Impact of climate change on the coastal zone;

(iv) Control and monitoring of the shoreline changes;

(v) Use of aerial photographs and satellite imagery in coastal zone studies;

(vi) Standard and digital mapping of the coastal zone;

(vii) Management of data base in the coastal zone.

A synthesis of the above presentations is being compiled, jointly with case studies presented by the participants. This will constitute the Training Course Proceedings.

4.2.2 Field Trips

Due to the importance of field studies and gathering of "in situ" data, two field were conducted in the coastal area of Trinidad. The first one, on Saturday 24, on the East coast of Trinidad, to visit an eroded shoreline and related management in view of its recuperation. The second one, on Thursday 29, on the North coast for a GPS beach profile training.

4.2.3 Case Study

Each participant presented a case study relevant to his country and oriented towards the objectives of the course. The list of the presentations is included in this report as Annex IV.

5. COURSE EVALUATION

All participants completed an evaluation form at the end of the course. They expressed a positive appreciation of the course and, as a result of a discussion with the instructors, a few suggestions were made regarding future training courses and the implementation of the IOCARIBE/OSNLR Project. These suggestions were added to the recommendations. Instructors estimated that the Institute of Marine Affairs provided a very efficient administrative and technical support. They were very pleased about the great interest shown by the participants.

6. GENERAL CONCLUSIONS

The Course was a success, due to the topics presented as to the training received and field trips. The excellent administrative and technical support provided by the IMA contributed to the positive outcomes of the course. The participants received a substantial training, a good part of which may immediately be applied to their work on coastal zone problems. This first training step which was a great success supports a very active future development for the IOCARIBE/OSNLR Programme.

7. PROPOSAL AND RECOMMENDATIONS

Two Working Groups were constituted. The first one represented the continental countries (Colombia, Mexico, Venezuela); the other one, the island countries (Barbados, Cuba, Trinidad). In close collaboration with the instructors, both groups determined the following targets:

(i) elaborate a proposal for 1993-1994;

(ii) propose future joint activities;

(iii) formulate recommendations.

7.1 PROPOSAL

The participants were invited to elaborate a working proposal for 1993-1994 to be implemented in the Caribbean, in the framework of the IOCARIBE/OSNLR Programme. This proposal should be flexible enough to help the institutions involved to develop their local component.

Each working group elaborated its proposal. Because of their similar objectives, both proposals were combined at the end of the course. The result of this synthesis appears as Annex II of this report.

7.2 FUTURE ACTIVITIES

The possibility to carry out joint activities with local institutional components of the UNEP Environmental Action Plan for the Caribbean within the general framework of the IOCARIBE/OSNLR programmes was discussed. The activities proposed are in line with the ideas expressed in the proposal presented in Annex II. They mainly consist in:

7.2.1 Monitoring and Control Programmes

The participants unanimously agreed to propose a monitoring and control programme for critical areas in the Caribbean with special emphasis on monitoring of climatic changes and shoreline variations. It was suggested that this would be carried out in close relation to the IOCARIBE Programme on OPC and the GLOOS tide gauges Network since they are complementary activities. The list of the shoreline critical areas proposed by the participants is provided in Annex II.

7.2.2 Coastal Cartography

The main basic documents required for a good management of the coastal zone, include the characterization of main processes interacting in the coastal zone through their quantification and adequate cartography. At the national level, coastal cartography is being carried out by several institutions, among others:

(i) The CIOH (Colombia), with its Programme on Census of Low-tide Areas, which corresponds to a detailed cartography of morphologic and socio-economic aspects of the Colombian Caribbean.

(ii) INGEOMINAS (Colombia), with the Coastal Geomorphology Atlas.

(iii) The USGS and Duke University, with their programmes on Digital Shoreline Analysis Systems and Digital Shoreline Mapping System.

It was also proposed that these different types and levels of cartography be exploited as a basis of discussion for the establishment of a "Common Methodology" which is expected to be used at the regional Caribbean scale.

7.2.3 Course (second step)

Taking into account the integral management and planning of the coastal zone, the participants proposed the formulation of a Training Course on modelling and cartography of the coastal zone.

This course represents the second step of the Training Courses planned within the IOCARIBE OSNLR Project on "Global Change and Coastal Land Loss: Management and Decision-Making in support of Sustainable Development within the Caribbean and Adjacent Regions". It is scheduled to be carried out by the end of 1994 in a Caribbean Spanish-speaking country. Two possibilities were offered: The CIOH (Cartagena, Colombia) and EDIMAR, La Salle Foundation (Margarita island, Venezuela).

7.2.4 Meeting of the OSNLR Group of Experts

In order to organize activities proposed during this training course, in particular regarding the definition of a common methodology, a meeting of the OSNLR Group of Experts was proposed for the beginning of 1994. Two possible places were proposed: Havana, (Cuba), to be held jointly with the Third Congress of Marine Sciences and EDIMAR, La Salle Foundation, Margarita Island (Venezuela). The possibility of holding this meeting in conjunction with the OPC Group of Experts Meeting, considering that both of these IOC/IOCARIBE programmes have complementary activities, was also proposed.

7.3 RECOMMENDATIONS

The recommendations proposed by the participants were in close relation with the development of the activities of the OSNLR Programme in the Caribbean:

(i) Each country will submit to the IOCARIBE Secretariat a schedule of the local activities relevant to the proposal, with a view to provide the OSNLR/GE meeting (first trimester 1994) with up-dated information on the evolution of each country's progress component.

(ii) Countries will be requested to identify human resources and equipment needed to carried out the local component of the proposal.

(iii) Countries will also be requested to designate their focal point for the regional IOCARIBE/OSNLR programme.

Regarding these requests, it was recommended that the IOCARIBE Secretariat centralize the exchange of information and documentation between the representatives of the OSNLR Network in the Caribbean.

(iv) Taking into account their complementary activities, it was recommended to hold the OSNLR and OPC Group of Experts Meeting at the same time. The IOCARIBE Secretariat was requested to establish the relevant contacts.

ANNEX I

COURSE PROGRAMME

Wednesday 21	**Library**
09:00 - 10:00	Meeting with Avril Siung-Chang, Malcolm Hendry and IMA Scientists on the general schedule of the Course
10:00 - 10:30	Break
10:30 - 12:00	Final arrangements of the course schedule
12:00 - 13:30	Lunch (IMA)
13:30 - 15:00	Final technical arrangements for the course
15:00 - 15:30	Break
15:30 - 17:00	Notes and manual memoire discussion
Thursday 22 July	**Meeting Room**
08:00 - 09:00	Inscription
09:00 - 09:10	Opening and Welcome (Mr. L. Ballah, Director IMA)
09:10 - 09:20	Background, Introduction to the Course (G. Vernette)
09:20 - 09:30	Administrative Arrangements (A. Siung-Chang)
09:30 - 09:45	Introduction of the participants and instructors
09:45 - 10:45	Coastal Classification (B. Greenidge)
10:45 - 11:00	Break
11:00 - 12:30	Coastal Process-Response Systems and Coastal Evolution (M. Hendry)
12:30 - 13:30	Lunch (IMA)
13:30 - 14:30	Coastal Process-Response Systems and Coastal Evolution, Case Studies from Trinidad (C. O'Brien Delpesh)
14:30 - 15:30	Coastal Process-Response Systems and Coastal Evolution, Case Studies from Colombia (G. Vernette)
15:30 - 15:45	Break
15:45 - 16:30	Coastal Process-Response Systems and Coastal Evolution, Case Studies from Barbados (M. Hendry)
16:30 - 17:15	Coastal Process-Response Systems and Coastal Evolution, Case Studies from Cuba (J. Foyo)
17:15 - 17:45	Travel IMA - Hotels
Friday 23 July	**Meeting Room**
08:30 - 09:00	Travel Hotels - IMA
09:00 - 10:30	Coastal Oceanography: Waves, Tides and currents (J. Wolf)
10:30 - 10:45	Break
10:45 - 12:30	Shoreline Change and Costal Zone Management (M. Hendry)
12:30 - 13:30	Lunch (IMA)
13:30 - 16:15	IMA's Laboratories and Tide gauge visit
16:15 - 16:30	Break
16:30 - 17:00	Organization of the Working Group (G. Vernette)
17:00 - 19:00	IMA Reception
Satirday 24 July	
06:00 - 17:00	Field trip on the Trinidad east coast
Sunday 25 July	**Free**

Monday 26 July	**Meeting Room**
08:30 - 09:00	Travel Hotels - IMA
09:00 - 10:30	Historical Method (M. Hendry)
10:30 - 10:45	Break
10:45 - 12:30	Aerial Photography for Coastal Zone Studies (G. Alleng)
12:30 - 13:30	Lunch (IMA)
13:30 - 15:45	Aerial Photography, Practical Exercises (G. Alleng and L. Gerald)
15:45 - 16:00	Break
16:00 - 18:00	Participants' Case Study Presentation: - Mexico (J. Aguayo) - Venezuela (M. LLano) - Barbados (L. Toppin) - Colombia (H. Millan)
18:00 - 18:30	Travel IMA - Hotels

Tuesday 27 July	**Meeting and Computer Rooms**
08:30 - 09:00	Travel Hotels - IMA
09:00 - 10:30	Geological Technics for Coastal Zone Monitoring (R. Thieler)
10:30 - 10:45	Break
10:45 - 12:30	Digital Shoreline Analysis System (R. Thieler)
12:30 - 13:30	Lunch (IMA)
13:30 - 14:30	Digital Shoreline Mapping System (R. Thieler)
14:30 - 15:30	Practical Exercises on Computer (R. Thieler)
15:30 - 15:45	Break
15:45 - 17:30	Working Groups: Continental Countries (Colombia, Mexico, Venezuela) Island Countries (Barbados, Cuba, Trinidad)
17:30 - 18:00	Travel IMA - Hotels

Wednesday 28	**Meeting and Computer Rooms**
08:30 - 09:00	Travel Hotels - IMA
09:00 - 10:30	Coastal Mapping (J. Foyo)
10:30 - 10:45	Break
10:45 - 12:30	Coastal Mapping, Case Study from Cuba (J. Foyo)
12:30 - 13:30	Lunch (IMA)
13:30 - 15:30	Practical Exercises on Computer (R. Thieler)
15:30 - 15:45	Break
15:45 - 17:30	Working Groups: Proposal and Recommendations
17:30 - 18:00	Travel IMA - Hotels

Thursday 29 July	
08:30 - 09:00	Travel Hotels - IMA
09:00 - 10:30	Coastal Change Monitoring System (K. Atherley)
10:30 - 12:30	Field trip: Sample technic and GPS Localization (K. Atherley)
12:30 - 13:30	Lunch (IMA)
13:30 - 15:00	Participants' Case Study Presentation: - Trinidad (P. Joseph) - Mexico (M. Gutierrez) - Colombia (J. Gonzalez)
15:00 - 15:15	Break
15:15 - 17:30	Working Groups: Proposal and Recommendations
17:30 - 18:00	Travel IMA - Hotels

Friday 30 July	**Meeting Room**
08:30 - 09:00	Travel Hotels - IMA
09:00 - 10:30	Coastal Change Monitoring System, Case Study from Barbados (K. Atherley)
10:30 - 10:45	Break
10:45 - 12:30	Coastal Change Monitoring System, Case Study from Cuba by Video Tape (J. Foyo)
12:30 - 13:30	Lunch (IMA)
13:30 - 15:00	Participants' Case Study Presentation: - Venezuela (J. Arismendi) - Venezuela (M. Olivo) - Cuba (C. Garcia)
15:00 - 15:15	Break
15:45 - 16:45	Proposal and Recommendations
16:45 - 17:00	Closing Ceremony
17:00 - 18:30	Cocktail
18:00 - 19:00	Travel IMA - Hotels

ANNEX II

PROPOSAL PRESENTED BY THE PARTICIPANTS

I. Background

The First IOC-IOCARIBE/UNEP Training Course on Monitoring and Control of Shoreline Changes in the Caribbean Region reviewed a compound of methodologies regarding measurement and quantification of nearshore changes in the Caribbean coastal zone.

It was also evidenced that participating countries in this meeting work with some of these methodologies, but not using always the same levels and criteria. Nevertheless, trained personnel is available to carry out a general programme of monitoring and control which permits gathering sufficent basic information on existing phenomena to use them in the formulation of contingency plans for the Caribbean coastal zone.

Since generalization cannot be done regarding land loss in the coastal zone, nor evaluation of the backward motion or the origin of the phenomenon, it is necessary to emphasize that the methodology to apply must be flexible enough to be adapted case by case, as well in island states as in continental coastal states.

II. Justification

This programme is justified by the urgent need to gather adequate information for the following purposes:

(i) Identify coastal areas that actually show a fast shoreline recession process;

(ii) Quantification of these processes in meters/year;

(iii) Propose explanations about this phenomena, and;

(iv) Whenever possible, elaborate models which could enable the prediction of these changes.

Taking into account the above, appropriate decisions on control and whole management of the coastal zone could be taken.

III. Goals

General Goal:

To establish a permanent monitoring and control programme of coastal zone changes in the Caribbean and Adjacent Regions.

Specific Goals:

(i) Establish maps for the quantification of changes which already occurred or likely to occur in the coastal zone. In this perspective, changes resulting from natural as well as from anthropogenic phenomena should be taken into account.

(ii) Establish a coastal zone classification to identify and pay special attention on critical areas.

(iii) Develop monitoring programmes taking into account the specific parameters in each country, in order to create data banks on long-time scales.

(iv) Develop specific models to predict changes to be used in contingency plans and integral management of the coastal zone.

IV. Methodology

The countries from the Caribbean and adjacent regions will initially use the methodologies available to them, while a manual to determine the different intercalibration techniques be published ("Common Methodology").

Therefore, this proposal is mainly aimed at standardizing the final product of the investigations, such as maps (work scales, symbology, units, etc) rather than field work methodologies.

Finally, all results obtained should follow the same steps, in order to be compared when needed. These steps should include:

Control:
All measures should be taken using a specific reference or control point.

Mapping:
Maps from the baseline will be elaborated and/or country profiles where past changes of the coastal zone, as well as future changes, can be identified.

Monitoring:
Monitoring covers all field activities directed towards evaluation of the coastal zone evolution process, as well as logistics to perform it.

Data Management:
The programme should also consider the best way to use the information provided regarding the contingency plans and integral management of the coastal zone.

V. Expected Results

Several types of results are expected from this proposal:

(i) Identification and classification of endangered coastal areas.

(ii) Quantification of the magnitude of relevant coastal processes, land loss, etc.

(iii) Determination of annual scales of these phenomena.

(iv) Obtention of final criteria to be used to formulate contingency plans and control of the coastal zone.

VI. Chronogram

Within the framework of this proposal, an activity chronogram is proposed at the institutional regional level which - together with activities of the IOCARIBE/OSNLR Programme of IOC and the UNEP Environmental Action Plan for the Caribbean (IPID Activity b, Phase 2) - would facilitate the organization of meetings and training courses during the next two years, and generate reports on the activities and developments of the programme.

VII. List of critical areas

Participants selected critical areas of their countries concerned with erosion problems or over social-economical exploitation, to carry out a monitoring and control study in the framework of the proposal. The sectors chosen were the following:

(i) Continental Countries

Colombia: "El Golfo de Morrosquillo"

This study is based on previous investigations, or being carried out at present by the CIOH in the framework of the "Census of Low-tide areas", or INGEOMINAS with the project entitled "Geomorphological characteristics and Erosional Problems in the Colombian Caribbean".

Mexico: Two sectors were proposed:

- The deltaic plains of Tabasco ("La Llanura deltaica de Tabasco")
- Eastern part of the Yucatan peninsula.

Both sectors depend from the ICMyL/UNAM.

Venezuela: Two sectors were selected:

- Lagoon system Tacarigua-Unare-Piritu
- Coastal Zone of Margarita Island

Both sectors have multi-institutional projects. The first one is co-ordinated by the Oceanographic Institute of The Universidad de Oriente (Cumana), the second one by the EDIMAR Fundacion La Salle and the Ministry of Environment and Natural Renewal Resources (MARNR).

(ii) Small Island States

Barbados: Scotland District

Study of the coastal area of this district, where the Coastal Conservation Project Unit (CCPU) is very active.

Cuba: Two sectors were proposed;

- "El Varadero"
- Cocos Cay.

The Center of Coastal Ecosystems of the Institute of Oceanology (Science Academy of Cuba) is in charge of both studies. The first one is focused on a beach nourishment plan, the second one corresponds to a new coastal environment study programme.

Trinidad: Cocas and Mayaros Bay (eastern coast of Trinidad).

The main body involved in this study is the Institute of Marine Affairs (IMA).

ANNEX III/ANEXO III

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ANNEX IV

LIST OF CASE STUDIES

1. BARBADOS

   Proposal for Measurement and Monitoring of Shoreline Changes at Six Men's Bay, St. Peter, Barbados.
   Lester TOPPIN, Coastal Conservation Project Unit (CCPU).

2. CUBA

   Technical Definitions for the Elaboration of Cuban Coastal Law
   Carlos GARCIA, Instituto de Oceanología, Academia de Ciencias.

3. COLOMBIA

   Geomorphology and Erosive Aspects of the Colombian Caribbean Coastal Zone, Juan Luis Gonzales, INGEOMINAS

   Census of Low Tide Areas in the Colombian Caribbean Zone
   Enrique Millan, CIOH

4. MEXICO

   Coastal Dynamics caused by Anthropogenic Action on the Deltaic Fluvial System of the Southeastern part of Mexico, Joaquin Eduardo Aguayo, ICMyL/UNAM

   Morphology and Sedimentology of the Southwest Continental Shelf of Mexico Gulf, Mario Gutierrez Estrada, ICMyL/UNAM

5. TRINIDAD

   Beach Nourishment at Chaquille Bay, Trinidad, Peter Joseph, Institute of Marine Affairs.

6. VENEZUELA

   Geomorphologic Diagnosis and Influence of Venezuelan Coastal Land Recovery, José Arismendi, CPDI.

   Development of an Experimental Design for Evaluations done through Vectorial Analysis of Medium Size Grains, Martin Llano, EDIMAR.

   Disposition Problems of Coastal Lagoons in Venezuela, Maria de Lourdes Olivo, MARNR.

ANNEX V/ANEXO V

LIST OF INFORMATION DOCUMENTS
LISTA DE DOCUMENTOS DE INFORMACION

IPCC	Global Climate Change and the Rising Challenge of the Sea, May 1992.
IGBP	Global Change Report No. 12, 1990.
Bull.IGBA	Cours International d' Océanologie Côtière en Région Caraïbe, No. 46, 1989.
Journal of Coastal Research/93	Historical Shoreline Changes Mapping: Improving Technique and Reducing Positioning Errors, by Robert Thieler and William Danforth.
USGS	Digital Shoreline Analysis System (DSAS) User's Guide, by William Danforth and Robert Thieler, Open-file Report 92-355.
USGS	Digital Shoreline Mapping System (DSMS) User's Guide, by William Danforth and Robert Thieler, Open-file Report 92-240.
IMA	Coastal erosion, coastal defense and land-use planning along the Atlantic Coast of Trinidad, Field Trip Guide, July 1993.
CIOH	Manual de Procedimientos y Técnicas para la realización del Censo de los terrenos de bajamar.

ANNEX VI

COURSE CERTIFICATE

This is to certify that

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participated in the

IOC/UNEP WORKSHOP on "MEASUREMENT AND MONITORING OF SHORELINE CHANGES IN THE CARIBBEAN REGIONS"

COI/PNUMA TALLER SOBRE "MEDICIONES Y VIGILANCIA DE LOS CAMBIOS EN LA ZONA COSTERA EN LA REGION DEL CARIBE"

conducted by

Intergovernmental Oceanographic Commission (of UNESCO)
IOC Sub-Commission for the Caribbean and Adjacent Regions (IOCARIBE)

Institute of Marine Affairs
Hilltop Lane, Chaguaramas,
Trinidad and Tobag, W.I.

From 22nd to 30th July 1993 at the Institute of Marine Affairs, Trinidad.

Dr. Avril Sing-Chang
Principal Research Officer, IMA

Dr. George Vernette
IOCARIBE Secretariat

ANNEX VII/ANEXO VII

LIST OF ACRONYMS AND ABBREVIATIONS/ LISTA DE SIGLAS Y ABREVIATURAS

ACP	African Caribbean and Pacific countries Grupo de los países del Africa, Caribe y Pacífico (CEC/CCE)
CCPU	Coastal Conservation Project Unit (Bardados)
CIOH	Centro de Investigaciones Oceanográficas e Hidrográficas (Colombia)
CPDI	Centro de Procesamiento Digital de Imagenes (Venezuela)
CEC/CEE	Commission for the European Communities Comisión de las Comunidades Europeas
EDIMAR	Estación de Investigaciones Marinas de Margarita (Venezuela)
GPS	Global Positioning System
ICZM	Integrated Coastal Zone Management
IGBA	Institut de Géologie du Bassin d'Aquitaine (Francia)
IGBP	International Geosphere-Biosphere Programme (ICSU)
IMA	Institute of Marine Affairs (Trinidad y Tobago)
IOC/COI	Intergovernmental Oceanographic Commission Comisión Oceanográfica Intergubernamental (UNESCO)
IOCARIBE	IOC Sub-Commission for the Caribbean and Adjacent Regions Subcomisión de la COI para el Caribe y Regiones Adyacentes
IPCC	Intergovernmental Panel on Climate Change (WMO/UNEP)
MAREMP	Marine Resources and Environmental Management Programme (Barbados)
MARNR	Ministerio del Ambiente y de los Recursos Naturales Renovables (Venezuela)
OSNLR	Ocean Science in Relation to Non-Living Resources Ciencia Oceánica en Relación a los Recursos No-Vivos (COI)
UNEP/ PNUMA	United Nations Environmental Programme Programa de las Naciones Unidas para el Medio Ambiente
UNESCO	United Nations Educational, Scientific and Cultural Organization/Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura
UWI	University of the West Indies