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CLME+ Project
Caribbean & North Brazil Shelf Large Marine Ecosystems



Marine Spatial Planning and Decision Support Systems in the Wider Caribbean Workshop Report

70th GCFI Annual Meeting, Special Workshop
Merida, Mexico
November 5, 2017

I. Introduction and opening

1. Marine spatial planning (MSP) as well as Decision Support Systems (DSS) have been identified as important tools for implementing Ecosystem Based Management (EBM) needed to pursue the conservation of the coastal and marine resources, and the promotion and sustainable use of these resources in the Wider Caribbean Region.
2. Conservation and sustainable use of coastal and marine resources are considered under Sustainable Development Goal (SDG) 14 of the United Nations 2030 Agenda for Sustainable Development adopted by 175 countries. The need for actions to achieve these goals should be based on the utilization of the best available scientific information, the incorporation of risk analysis, and a broad participation of stakeholders to tackle complex ecosystem relationships and dynamics.
3. It is under this framework that a number of local and regional MSP/DSS initiatives are currently being developed across the Wider Caribbean. However, there is need for better coordination and further expansion of MSP/EBM efforts throughout this region. The present *MSP/DSS systems in the Wider Caribbean workshop* was the result of a joint effort among several institutional partners (see section III)
4. In supporting the present workshop, the above partners sought to improve and provide a better understanding of the past and present MSP/DSS activities, and identification of potential ways to be more effective and improve regional coordination and support mechanisms towards its application by Governments and other stakeholders in the region
5. The workshop was opened at **Hotel Hyatt Regency Merida Hotel, Merida, Mexico (as part of the GCFI Annual Meeting)** at 09:30 hs by Patrick Debels, the coordinator of the Caribbean Large Marine Ecosystem project, in representation of all of the workshop organizers, extending welcome to all participants.

II. Objectives

6. The workshop aimed to facilitate dialogue among key stakeholders involved in MSP and DSS initiatives in the Wider Caribbean Region towards:
 - Learning about existing approaches and methods in MSP and DSS
 - Discussing the status of existing efforts and future plans for MSP in the Caribbean
 - Sharing lessons learned related to resource use mapping, stakeholder engagement, MSP processes and plan implementation, including enforcement
 - Designing approaches for future coordination among MSP efforts
 - Discussing the potential for creating an evaluation mechanism to track MSP progress and performance across the Wider Caribbean
 - Exploring opportunities to further expand MSP efforts in the region

III. Organizers

7. **Sustainable Management of Shared Living Marine Resources in the Caribbean and North Brazil Shelf Large Marine Ecosystems project (CMLE+)**: This is a Global Environment Facility (GEF) funded project implemented by the United Nations Office for Project Services (UNOPS), and it is aimed at developing a platform to better coordinate and further expand MSP efforts in the Wider Caribbean/CLME+ region via the Strategic Action Plan (SAP) creating a regional umbrella programme.
8. **Biodiversity for Sustainable Development in the Caribbean through Ecosystem Based Management (EBM-DSS)**: UN Environment/Caribbean Environment Programme (CEP) is implementing this project under the Protocol concerning Specially Protected Areas and Wildlife (SPAW), being funded by the Italian Agency for Cooperation and Development (AICS). The project is aimed towards developing capacities and information systems as well as pilot test their application, that can be used by governments and non-governmental organisations, to support decisions on planning and managing coastal resources with an ecosystem-based management (EBM) approach.
9. **Waitt Institute**: This non-governmental organization partners with small-island governments to envision, create, and implement sustainable ocean policies. The Institute is currently working through four partnerships in the Caribbean, Blue Halo Barbuda, Antigua National Parks Ocean Initiative, Blue Halo Curaçao, and Blue Halo Montserrat. The Institute also works through the Vava'u Ocean Initiative in Tonga.

10. **The Nature Conservancy (TNC):** This non-governmental organisation has been working for more than a decade in the advance of ocean management through MSP processes and other means. Their work includes a special Caribbean programme.
11. **World Wide Fund for Nature (WWF) - Guianas:** This non-governmental organisation is working to promote integrated and participatory ocean governance in the Guianas.
12. **Gulf and Caribbean Fisheries Institute (GCFI):** This regional organisation focuses on building management capacity among Caribbean coral reef managers through its MPA connect network which is funded by the NOAA Coral Reef Program.

IV. Workshop Organisation

13. The one-day workshop (November 5, 2017) was held as a special workshop during the 70th GCFI Annual Meeting in Merida, Mexico, at the Hyatt Regency Hotel, Merida It was divided into two (2) main sections:
14. **1) Morning Session:** where participants were engaged in short informative presentations, guided discussions and separated into four (4) breakout groups allowing for better understanding of existing regional efforts, and in-depth analysis of different tools and approaches focused primarily on MSP initiatives being utilized in the Caribbean;
15. **2) Afternoon Session:** where the EBM/DSS concepts, methods, and progress in their application in a pilot project in the Dominican Republic were presented. To facilitate the discussion participants were divided into three (3) working groups to identify ecological problems/issues/ecosystems relevant across the Caribbean region that could be considered for the application of the EBM/DSS methodology. The detailed agenda is presented in ANNEX 1.
16. The workshop was attended by a total of fifty (50) participants from across the Wider Caribbean including partners, government representatives, experts, and non-governmental organisations (ANNEX 2). A photograph collection is also shown in ANNEX 3.

MORNING SESSION

SECTION I. INFORMATION ON MARINE SPATIAL PLANNING (MSP)

V. Existing Initiatives and Current/Expected Accomplishments

17. Patrick Debels mentioned that the Wider Caribbean and its extension to the North Brazil Shelf commonly referred as the CLME+ region, is a vast (4.4 million square kilometres) extremely diverse area, and one of the most complex in the world. As such it is in need of implementation mechanisms to enable coordination, collaboration, and integration of a regionally agreed Strategic Action Plan

(SAP) for facilitating EBM, to ensure sustainable resource use and climate-resilient provision of goods and ecosystem services. The timely provision of MSP/DSS information is critical towards the implementation of these actions, and the possibility of analysing regional initiatives towards applying MSP/DSS is of critical relevance.

18. The following regional initiatives were presented as the main efforts underway in the Caribbean:
19. Kathryn Mengerink (Waitt Institute) described the organisation's MSP sites and processes that were underway, completed, or planned from 2013 to 2020. These included: a) Barbuda (2013-2019) now focused on hurricane recovery instead of the originally scheduled training, monitoring and enforcement; b) Curacao and Montserrat (2015-2020) working on policy adoption, legal development, and marine spatial planning; c) Antigua National Parks and Vava'u (2017-2019) focusing on sustainable ocean management through MSP and community-based fisheries management. Stakeholders involved in MSP/EBM projects include a variety of partnerships with the government, communities, and working with international partners. Status updates of the various country projects (particularly following passage of Hurricane Irma) were provided.
20. Joanna Smith and John Knowles (TNC) presented on the evolution of MSP projects in the organisation between 2008 to 2017 - moving from science and research, into multi-objective planning and facilitation, and now to leadership, advising, financing mechanisms, and international policy. They have worked on eleven (11) different projects in the US (Florida, Puerto Rico, and the US Virgin Islands), Dominican Republic (Samana Bay), Jamaica (Pedro Bank), St. Kitts and Nevis, Dominica, Grenada, St. Lucia, and St. Vincent and the Grenadines. In summary, spatial catalogues, zoning design, and feasibility analysis were completed. The incorporation of aspects pertaining to biodiversity, fisheries, energy, and tourism have been extended to further include financing and financial mechanisms, along with international policy and climate change considerations. TNC is committed to expanding MSP to other countries.
21. Hanneke Van Lavieren (WWF, Guianas) mentioned that MSP in Suriname and Guyana is part of the project entitled "*Promoting Integrated and Participatory Ocean Governance in Guyana and Suriname: the Eastern Gate to the Caribbean*" (2017-2020). This is an EU funded initiative aimed at enhancing knowledge of the marine environment, increased capacity, and a collaborative process with ocean users linked to Aichi targets. Therefore, they focus on determining current, and future uses of ocean ecosystems and resources, and maintaining the availability of ecosystem services for future generations. Over the four (4) years, activities will focus on legislative review, mapping, assessing and compiling social, economic and environmental data, participatory data collection, and developing a model to predict/assess trade-offs and create scenarios. Some of the target groups include national regulatory agencies, coastal communities, hydrocarbon, and the tourism industry. They highlighted the fact that MSP is not a linear process, but rather dynamic with many feedback loops.

22. Martha Prada (UN Environment, CEP consultant) project manager for the Project “*Biodiversity for Sustainable Development in the Caribbean through Ecosystem Based Management (EBM)*” reported on activities related to the development of capacities and information systems needed for decision support in planning, and sustainable management of coastal and marine resources. This three (3) year project (2015-2018) consists of seven (7) output oriented results which includes the evaluation of existing MPA database and its usefulness for application of DSS strategies, design and development of two (2) pilots in Dominican Republic, improvement of training and MPA management, and promotion for regional use of this EBM/DSS integrated approach. PROGES (Italian consulting firm), The Ministry of Environment and Natural Resources in Dominican Republic (MARENA), GCFI, CERMES (Centre for Resource Management and Environmental Studies, University of West Indies, Barbados), INVEMAR (Instituto de Investigaciones Marinas y Costeras Jose Beneito Vives de Andreis, Colombia), and the Regional Activity Centre for the SPAW Protocol (SPAW-RAC), are all project partners.
23. Juan Posada (Fundación MarViva) explained that since 2012, they had adjusted the UNESCO guide (Marine Spatial Planning, a Step by Step Approach Towards Ecosystem Based Management) by incorporating traditional knowledge from coastal inhabitants on Pacific sites in Costa Rica, Panama, and Colombia. In their experience, there is a general lack of technical and scientific information - but this should not be a barrier to advancing MSP processes. Both political and public involvement, the inclusion of ecosystem considerations, and an integrative participatory approach, were all key for success. He also provided background on Blue Solutions (noting the course “*Blue Training in Practice*”) which had developed strong capabilities regarding MPS training and education.
24. Emma Doyle (GCFI) presented on the network *MPA Connect*, established in 2010, to build management capacity and facilitate the sharing of experiences between Caribbean coral reef managers and MPA managers, and to promote the adoption of best management practices. The network is comprised of around thirty (30) MPA managers from ten (10) countries/territories. Working sites have been selected based on ecological significance and commitments to international initiatives, along with a readiness to implement MPAs as tools. The process involves a variety of mechanisms such as Peer-to-Peer exchanges, capacity assessment, site support, various partners (e.g. GCFI, NOAA Coral Reef Conservation programme, and several local agencies), and the use of socioeconomic monitoring (SocMon). The network is also planned for expansion to a sub-regional level (e.g. in the Grenadines), scaling up achievements across ecological zones, where there were otherwise small and fragmented MPAs. Expected outcomes to 2018 were also presented.
25. David Robin (OECS, Organisation of Eastern Caribbean States) conducted an online presentation regarding the use of MSP and DSS in the Wider Caribbean via the *Ocean’s Governance Framework* as part of the OECS (Organisation of the Eastern Caribbean States - consisting of seven (7) full country members and three (3) associated ones). Work is guided by international, hemispheric, regional, and sub-regional initiatives, including multilateral environmental agreements (e.g. Treaty of

Chaguaramas). OECS's vision for the ocean is also guided by the *Eastern Caribbean Regional Ocean Policy* (ECROP) which integrates ocean policies with specific reference to Policy 4 (Adopt multiple-use ocean planning and integrated management as linked to MSP DSS framework). Further LME linkages highlighted through the *Caribbean Regional Ocean-scape Project* (CROP) (USD 6.3M) with a focus on national coastal master plans and MSP - approved in September 2017. Via partnership with the World Bank platform and TNC, OECS hopes to expand marine data aggregation and analytic tools.

26. Following the above presentations, participants highlighted, commented on, or enquired about the following topics:

- The Peer to Peer training (Emma Doyle's response to question asked by Joanna Smith) is based on interaction with MPA law enforcement, sustainable financing, socioeconomic and biophysical monitoring, followed by financing via regional workshops towards capacity building through capacity needs assessment. Focus is on effective management of MPAs and implementation.
- It is important to include additional opportunities for partnership (Christopher Corbin) -in addition to the EBM project, UN Environment-CEP is working with Trinidad, Suriname, and Brazil on a broader EBM initiative in a parallel initiative via a new GEF project for integrating watershed management (IWeco). The project is targeting smaller insular Caribbean countries looking at a broad range of topics that provides room for linking with existing initiatives.
- As part of the training (Georgina Bustamante) mentioned the upcoming CaMPAM regional Training of Trainers course in Barbados (April 2018) and the possibility of joining and signing up and participate via CaMPAM Listserv (CaMPAM's electronic mailing list).
- Five (5) of the OECS member states are non-GEF eligible (David Robin) resulting in gaps within the area, particularly concerning MSP. Therefore, it is important moving forward to determine how to bridge these gaps. Challenge concurred (Patrick Debels) - noted support that the CLME+ project can provide to countries that cannot receive funding and existing work by Waitt Institute with overseas territories to help overcome this issue.

VI. Morning Working Groups

27. Participants were divided into four (4) working groups organized to discuss lessons learned, and identify ways to coordinate MSP initiatives related to:

1. MSP process - from plan to implementation, including identification of common elements, and best practices and challenges in the design and implementation of MSP
2. Stakeholder engagement - including discussion on best practices for stakeholder identification, messaging, participation, and consultation

3. Geospatial data collection and (participatory) mapping - including discussions on data availability, gaps, and research needs related to MSP
4. Enforcement and compliance - including identification of best practices for realistic enforcement mechanisms, especially in small island states, and discuss ways to strengthen compliance

After a general overview of the UNESCO 10 step process and linkages to the MSP mechanisms, the following were the main inputs gathered from the working groups:

28. Group 1. MSP process

- Main challenges to MSP process include government commitment to incorporate MSP into MPA networks, as well as into legislation and designations of new protected areas.
- It is important to use friendly language and terminology (noted the usefulness of using UNESCO terminology)
- Additional challenges include poor data management for designation of best areas and conservation alternatives; low government commitments to SDGs and other factors; lack of understanding of new technology developments; variable stakeholder engagement; limited funding; low governance to handle transboundary issues; complex institutional frameworks; need for good performance indicators; and better understanding of ecosystem services.

29. Group 2. Stakeholder engagement

- Management expectations and evaluation of miss-information was critical to increase stakeholder engagement. Core message is that “one size does not fit all”, and stakeholder engagement is context specific – important to incorporate the various ecosystem components and all stakeholders
- Need to go beyond MSP to include, for instance, issues concerning physical conditions, and ethnic and cultural aspects - important to address in order to properly engage stakeholders
- Essential to develop incentives and address deficiencies that result from gap analysis - creation of opportunities and consider the ability for intergenerational expansion; legal institutions (formal and informal) linked/guided by the various processes
- Networking requires that both aspects (people and ecology) are integrated - comes back to governance under formal law and legal mandate, and also informal processes, to allow this to happen

- Requires the use of key words, and considerations such as key species, gender/generational processes, and not only focused on specific products

30. Group 3. Data collection and mapping

- The need for the natural flow into habitat data, and challenges in region regarding data collection was highlighted
- There are data gaps in terrestrial extractives (WHAT IS TERRESTRIAL EXTRACTIVES???) and socio-economic data needed for MSP/DSS
- Available data is sometimes out of date
- It is important to continue progress made in developing standards for data collection and analysis
- Information needs to be used in a meaningful way - several geospatial technologies could be utilized; build on strengths of entities and institutions already using it
- Progress via regional monitoring protocols such as Global Coral Reef Monitoring Network (GCRMN) for coral reefs, are relevant to analyse results based on standardized data collection. There are other examples that can be used to guide ecosystem-based data collection efforts in the region - should include the need to incorporate both bio-physical and socioeconomic aspects
- Ecosystem and “blue services” (blue economy) have data gaps that need to be addressed

31. Group 4. Enforcement and compliance

- Socioeconomic factors affect legal process and need to be considered at different levels - there is need to develop awareness and recommendations for enforcement authorities
- Acknowledged that there will never be 100% compliance with regulation - there are constant threats and so there is a need for adapting responses, the “bottom-up approach” is promising. MSP via enforcement using “intelligence-based approach” sharing patrolling mechanisms, training and education based on science and monitoring
- It is important to build awareness to reach various stakeholders - the “top-down approach” in this case is also necessary
- Adjust the message as time passes. Be creative to pass the message to stakeholders, increase understanding, consistency, and transparency
- Community engagement is very important especially in regard to perception, and encouraging community involvement and trust

- Effective enforcement requires innovative technology

The following aspects were also commented on during the plenary session, subsequent to working group discussions outlined above

32. On indicators such as coral reef indicators, it might be useful to look at two (2) different levels, regional/global, and local indicators, to guide further development of monitoring strategies – necessary to zoom in and focus on what is important from a policy and management strategy standpoint.
33. Stakeholder engagement concerns individual and community groups/companies that need funding for MSP in the region, and to bring equity. Even though funding issues were not discussed in detail, there are various elements affecting stakeholder resources that were discussed, especially as it related to juggling livelihood and capacity - more in the context of how best to reach stakeholders according to their individual needs/ situations. Recognized was the importance of using/developing a Terms of Reference for funding which can have a range of uses, from travel support, to hiring of GIS consultants if needed; additional personnel to provide support for relevant stakeholder needs; honorary incentives for example to stakeholders for meeting attendance.
34. Access to/sharing data can benefit from existing platforms (e.g. IOC- Intergovernmental Oceanographic Commission/UN Environment). More work is needed in the evaluation of ecosystem services that would increase efficiency and sharing information, including public education on the value of ecosystem services.
35. Training can be conducted through regional nodes on MSP, for example in the case of INVEMAR which has recently become a regional node – used as a conduit for training. There is therefore the need to inform stakeholders on the opportunities that are available to the region.
36. There is need to demystify context of understanding the various jargons and environmental terminologies utilized in technical reports, regional initiatives, and management plans when working with stakeholders.
37. Enforcement success is related to the use of a very specific and effective information strategy in sharing the information to stakeholders, an aspect that should be explored further.
38. It was clarified that “citizen’s science” is a very recent mechanism, which refers to using and respecting local knowledge. It should be taken into consideration to increase the sustainability aspect.
39. Stakeholder engagement group commented that this was definitely addressed, alongside the ability to go out and collect information.

16. Collecting metadata can be shared within the region and it will be very useful. Governments in particular will benefit from existing protocols and frameworks - engagement of civil society in this regard needs to be explored further.

40. Data collection and mapping demand coordination, between existing projects and initiatives, and especially within communities. This is very important to ensure that stakeholders do not lose confidence due to disjointed efforts. There is a need for cohesion especially when working with local organisations and NGOs. This is for instance, one of the workshop objectives. There are increasingly positive examples of organisations working together and pooling resources. This will not happen overnight – important to find the paths to create sharing of information to encourage cohesion – something for the meeting to think about especially beyond this workshop.

VII. Facilitated Discussion / Recommendations

41. Moving away from business as usual, a round of comments and discussion to interact took place in plenary regarding (i) upscaling and expanding MSP efforts in the region; (ii) future coordination among MSP efforts; (iii) establishing a tracking mechanism; and (iv) next steps. The following topics were addressed:
42. Recommendation to pool mapping elements of all MSP efforts in the region including level of implementation – consideration for the various geographic differences; could be a useful tool to catalogue instruments in the WCR. The Caribbean Marine Atlas for instance is a start.
43. Through the Geonode, TNC is leading a process (critical to continue) - thus probably there is need to formalize agreements across the region.
44. Recommendation to build partnerships with business centres (e.g. tourism companies) to explore their involvement in regulation and enforcement. Therefore, it would be necessary to include them in this multi-sector effort since they are usually very influential with politicians. The GEF-CLME+ project already has a platform that could incorporate MSP efforts. Facebook Secret Group can be a useful sharing information mechanism.
45. To maximize existing global and regional commitments it is important to look for opportunities to integrate MSP and EBM in local/on the ground strategies with governments, and further utilize partnerships. Recommendations were made to document what is going on within the region to facilitate cross-referencing of efforts, looking at both the medium and long term.
46. Careful and pragmatic considerations are required in finding ways to better collaborate across the region. For instance, facilitating trainings and maximizing the benefits being provided instead of a disjointed approach. Consideration also to be given on how to make individual projects more

successful and share expertises. One mechanism could be the use of social media which can be very effective. Other mechanisms will need further discussion. The Yammer platform from BIOPAMA (Biodiversity and Protected Areas Management) could be useful in facilitating communication and sharing information. Consider the use of a selected hashtag (#) and its systematic use in helping to standardize efforts.

47. In a practical example, developing a calendar to track the various regional meetings and workshops being planned for MSP over the next six (6) months, avoiding the existing overload of information from multiple sources, would be useful.
48. Beyond use of platforms, what are the potential areas for working together effectively and in a collaborative manner? The suggestion was made of establishing a MSP working group, consisting of participants at the present workshop in order to maintain discussion about priority areas to work collaboratively.
49. It was highlighted that CLME+ hub being developed, along with a tool from CERMES via a graphic user interface prototype to allow users to see all the projects that are currently going on in the region. Such initiatives can guide other desired or foreseen efforts and hopefully prevent replication. CERMES's prototype is a work in progress and an announcement will be made once launched to encourage its use. This kind of inter-sectoral coordination can be used by MPA practitioners.

AFTERNOON SESSION

SECTION II. INFORMATION ON DECISION SUPPORT SYSTEM (DSS)

50. Christopher Corbin (UN Environment-CEP Secretariat) introduced the afternoon session and welcomed participants. He presented remarks on behalf of the CEP Secretariat and its Coordinator. Funding and support was acknowledged with special thanks to the Italian Agency for Cooperation and Development (IACD) of the Italian Ministry of Foreign Affairs and International Cooperation, along with other relevant partners.
51. He articulated the need for interconnectivity between programme areas, alongside the desire for fruitful exchange during the workshop, with participants urged to give particular consideration to how a Decision Support System (DSS) tool could aid the region in long term planning - specifically as it related to integrating MSP and EBM DSS as mechanisms to improve the management of marine resources.
52. Marco Falchetta and Edoardo Scepi from the Italian consulting company PROGES introduced the concept of DSS as a methodology designed to simulate reality by incorporating the complexity of the socio-ecological ecosystem context, with the involvement of a broad range of stakeholders. The software application then integrates these various components and sub-components into diagrams

which enable the visualization of the ecosystem, and then further analysis of the different scenarios. The methodological process of the DSS can be considered as the most relevant benefit of the tool. Overall, the software helps in understanding how interactions are occurring between ecosystems and stakeholders, and a practical example was presented.

53. The example illustrated the interconnected diagrams and mentioned quantitative indicators gathered for a section of the Dominican Republic north coast of Puerto Plata, the project's main ongoing pilot test site. The data consists of tabular (biophysical, socio-economic local data), and spatial data (thematic maps, satellite images, etc.), while noting that obtaining/compiling this information is not always an easy task to accomplish and is one of most difficult steps in this methodology. The software allows for easy visualization of the various habitat use areas (e.g. watersheds, infrastructure, forest coverage, agriculture production, industries, urban development etc.) by simply clicking a button. When a particular area is clicked, all the related components are then highlighted. This is a relatively simple model to represent complex ecosystem dynamics.
54. Once the conceptual model is clear, the temporal and spatial analysis is conducted with the help of quantitative indicators. Indicators are not always in single data form, but can be a combination of different elements. For instance, agriculture can be influenced by watershed dynamics, and so requires two types of data analysis. It was noted that data was still being collected for the pilot site, and that qualitative data can be integrated with quantitative data in the database to generate thematic maps. The data collected in the database can be compiled on a local drive or online.

Among the questions raised were the following issues:

55. How to handle/evaluate the scenarios generated? It was explained that the tool can illustrate any number of scenarios that the user (technical committee) desires - this will depend on the quality of data provided.
56. Regarding filling in data gaps, it was explained that since a complete dataset will unlikely be available, and thus the opinion of the experts or stakeholders involved can play an important contributory role. It is also possible to use colours to differentiate the different data sources (e.g. As in an of Albanian DSS project).
57. How to present tool to stakeholders? Workshops led by the PROGES consultants are the best option, as developers of the DSS tool, while local managers are those responsible for sharing the methodology, relevant information and working with local partners. Training and dissemination of this nature can help to spread knowledge, build local capacities and the application/ use of the tool.
58. A question was raised regarding the use of an online version - while it was clarified that this was not available. However, the diagrams can be posted on the web/phone application to facilitate group training. Explained that this is a desktop application with the ability to access remote data, allowing for a multi-window environment.

59. On the integration of legal framework in the analysis, it was mentioned that in fact, this was already being done (in the case of the Dominican Republic pilot application). However, it appears to not be an area of interest for several stakeholders who prefer to focus on other kinds of analysis.

60. The possibility for integration of a risk analysis in the software was questioned, thus including certain levels of uncertainty. It was responded that in the decision-making process - the box and arrow diagrams, risks can be included. If political influence plays a part in your decision, this relationship will be included in your diagram. To integrate uncertainty in the model, the tool uses probabilities as the basis for creating scenarios.

61. The pilot project in Dominican Republic is an example on how this multi-disciplinary and multi-institutional process is being developed.

VIII. Afternoon Working Groups: scaling up the DSS to a regional level

62. After the above general introductory morning session, in order to provide participants with a “hands-on” practical opportunity on the application of the DSS methodology, three (3) working groups were formed to address different components of the DSS model.

63. Group 1. Identification of Spatial Domain

There are several components critical to developing DSS in an area e.g.:

- Habitat components
- Keystone species
- Infrastructure
- Education and Institutions

64. Group 2. Identification of Issue Based Domain

- Impacts of mining
- Tourism impacts
- Impacts of climate change

65. Group 3. Identification of Benefits and Requirements of the DSS Application

- The regional nodes can help identify where data inventories are, as well how MSP/DSS is being disseminated and applied in the region, both in English and Spanish speaking countries.

- The application has to be demand driven or in response to regional analysis of the situation across different sub-regions. Regional nodes will be useful in working with end-users to identify their needs as a first step in the process.
- Through regional projects it will be possible to dedicate initial funding for DSS application at the regional level in the short term once an interested Government or a special coalition is created. However, the long-term sustainability will require stronger commitments from interested countries.
- Fisheries and coral reef management are two (2) monitoring programmes that have the potential to become the basis for regional application of DSS methodology. To implement this approach, interagency mechanisms are needed, therefore it is important to consult among key initiatives UN Environment, WWF Guianas, and TNC, among others. The greater the linkages established, the more affordable its application will be.
- There is a need for collaboration (including funding) among institutions and projects – in many cases they have goals and activities that have synergies and can be linked. To be effective, constant dialogue and negotiation on how to work together is required. Dialogue with donors is also needed so as to enhance the importance of collaboration.
- Capacity building is needed at all levels (from the business and the private sector in local areas, to local Governments). CANARY is one entity currently working on that. Some projects provide an opportunity to work and support implementation through Governments, and should be considered instead of necessarily prioritizing new partnerships, including with private sector stakeholders.
- Considering that decision systems usually work with soft money, a proprietary software such as in the case of the PROGES DSS methodology presented at this workshop, at some point may require further consideration in the long term. Some DSS applications utilize free software.

IX. Closing Remarks

66. The workshop was closed at 17:45 hs with appreciation expressed by Christopher Corbin for the valuable contributions by all participants, also on behalf of the core organizers. He reiterated that a more in-depth presentation and simulation of the application of this DSS tool will be the focus of an upcoming regional workshop being organised by CEP in Panama City (December 4-6, 2017). It was hoped that the present audience and partners organisations involved in this workshop would continue work on this topic for the benefit of enhanced management of resources and ecosystems in the Wider Caribbean.



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ANNEX 1. Workshop Agenda

WORKSHOP Marine Spatial Planning and Decision Support Systems in the Wider Caribbean

Date	5 November, 2017
Venue	Hotel Hyatt Regency Merida Hotel, Merida, Mexico (in conjunction with the 70 th GCFI Annual Conference)
Co-Organizers	GCFI, UNDP/GEF CLME+ Project, UN Environment-CEP (with support of IACD and collaboration of PROGES and MARENA), TNC, Waitt Institute, WWF
Participation	30-40 participants representing governments, NGOs, and private organisations that fund or implement EBM tools for marine spatial planning in the Wider Caribbean. The workshop is free-of-charge but participants are expected to cover their travel and accommodation or secure sponsorship.

ABOUT THE WORKSHOP

Marine spatial planning as well as Decision Support Systems (DSS) have been identified as important tools for implementing Ecosystem Based Management (EBM) needed for the promotion and enhancement of sustainable livelihoods in the Wider Caribbean Region.

In March 2017, UNESCO held the second international marine spatial planning (MSP) conference in Paris. The conference brought together experts from Europe, North America, Africa, Asia, and Latin America to share lessons learned and create a shared vision for MSP. Following the conference, several stakeholders in the Caribbean highlighted the need for a platform to better coordinate and further expand MSP efforts throughout the Caribbean.

To support these goals, the workshop will bring together key actors engaged in MSP and DSS in the Caribbean to:

- Learn about existing approaches and methods to MSP and DSS
- Discuss the status of existing efforts and future plans for MSP in the Caribbean
- Share lessons learned related to resources and use mapping, stakeholder engagement, MSP processes, and plan implementation including enforcement
- Design approaches for future coordination among MSP efforts
- Discuss the potential for creating an evaluation mechanism to track MSP progress and performance across the Wider Caribbean
- Explore opportunities to further expand MSP efforts in the region

The workshop will have two sessions. In the morning, participants will engage in discussions and a breakout session to accomplish the above objectives. In the afternoon, participants are invited to partake in a deep-dive to explore different tools and approaches in development and in use in the Caribbean.

Anticipated outcomes include a workshop report, a commitment by participants to strengthen coordination among MSP efforts, and the initiation of a mechanism for future collaboration.

The workshop is held in conjunction with the 70th Annual conference of the Gulf and Caribbean Fisheries Institute in Merida/Mexico; registration to the conference will be necessary to attend the workshop.

WORKSHOP AGENDA

TIME	AGENDA
9:00 - 9:30 AM	Welcome and opening remarks (<i>Patrick Debels, CLME+</i>) Short introduction by participants
9:30 - 10:30 AM	Facilitated discussion with presentations of MSP/DSS initiatives by: <ul style="list-style-type: none"> ▪ <i>David Robin, OECS</i> ▪ <i>Joanna Smith, TNC</i> ▪ <i>Kathryn Mengerink, Waitt Institute</i> ▪ <i>Hanneke van Lieren, WWF Guyanas</i> ▪ <i>Emma Doyle, GCFI</i> ▪ <i>Martha Prada, CEP</i> ▪ <i>Juan Posada, Marviva</i>
10:30 - 10:45 AM	Coffee break
10:45 - 11:45 AM	Break-out session. Working groups will explore lessons learned and identify ways to coordinate among MSP initiatives related to: <ul style="list-style-type: none"> ▪ MSP process from plan to implementation: participants will identify common elements, best practices and challenges in the design and implementation of MSP ▪ Stakeholder engagement: participants will discuss best practices for stakeholder identification, messaging, participation, and consultation ▪ Geospatial data collection and (participatory) mapping: participants will discuss data availability, gaps, and research needs related to MSP ▪ Enforcement and compliance: participants will identify best practices for realistic enforcement mechanisms in small island states, and discuss ways to strengthen compliance
11:45 - 12:15 PM	Plenary to present working group discussions: Each working group will present best practices, common challenges, and potential solutions to these challenges
12:15 - 1:00 PM	Facilitated group discussion with short address by co-organizers (<i>CLME+ and CEP</i>): (i) upscaling and expanding MSP efforts in the region; (ii) future coordination among MSP efforts; (iii) establishing a tracking mechanism; and (iv) next steps

1:00 - 2:30 PM **90 min.** **Lunch provided**

TIME	AGENDA
2:30 - 3:00 PM	The EBM/DSS concepts and methods and the Dominican Republic pilot project progress. Presented by PROGES and MARENA
3:00 - 4:00 PM	Working groups to discuss and identify ecological problems/issues/ecosystems that can be considered relevant across the Caribbean region that can be utilized for the application of the EBM/DSS methodology. This includes the identification of the available information at the country level, and filling in specially design matrices. Working group results will be delivered on digital format.
4:00 - 4:15 PM	Introduction to the up-coming Regional Workshop (Panama City, 4-6 December 2017). During this workshop participants will have the opportunity to learn in detail the methodological steps involved in the application of a DSS tool and explore the potential for future use/expansion of the planning recommendations and identification of priority management actions resulting from this analysis.
4:15 - 4:30 PM	Closure of workshop - Closing remarks

This event will be conducted in English, and there will be not simultaneous translation. Please inform Martha Prada (pradamc@gmail.com) if you need special assistance with English-Spanish translations.

ANNEX 2. Lis of Participants

No.	Name	Affiliation	E-mail
1	Alejandro Acosta	GCFI, Florida, USA	Alejandro.Acosta@myfwc.com
2	Andrea Salinas	CMLE+ project	AndreaS@unops.org
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9	Danielle Kitson	The Nature Conservancy Jamaica	danielle.kitson@tnc.org
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11	Edoardo Scepi	PROGES, Italy	edoardo.scepi@progesconsulting.it
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21	Juan Posada	Marviva, Panama	juan.posada@marviva.net
22	Julian Walcott	CERMES-UWI Barbados	walcott.julian@gmail.com
23	Kathryn Mengerink	Waitt Institute, California, USA	mengerink@waittinstitute.org
24	Kendra Beazer	Antigua Commercial Bank/ACB Mortgage & Trust Co. Ltd	kendrabeazer@gmail.com
25	Lavern Ryan	Government of Monserrat	Rogersl@gov.ms
26	Lucie Labbouz	SPAW-RAC, Guadeloupe, France	lucie.labbouz.carspaw@guadeloupe-parcnational.fr
27	Lucito Ayuso	Blue Hole and Half Moon Caye Natural Monuments, Belize	outreach@belizeaudubon.org
28	Luis Omar Martinez	MARENA, Government of the Dominican Republic (consultant)	lomarm@gmail.com
29	Luis Solorzano	TNC - Caribbean	luis.solorzano@tnc.org
30	Marco Falcetta	PROGES, Italy	marco.falcetta@progesconsulting.it
31	Maria Pena	CERMES-UWI, Barbados	maria.pena@cavehill.uwi.edu
32	Martha Prada	UN Environment CEP, Puerto Rico	pradamc@gmail.com
33	Nina Lysenko	MARENA, Government Dominican Republic	Nina.Lysenko@ambiente.gob.do
34	Pamela Fletcher	NOAA associated / UFL, Florida, USA	pamela.fletcher@noaa.gov
35	Patrick Debels	UNDP/GEF-CLME+, Colombia	PatrickD@unops.org

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39	Sandra Grant	Belize Marine Conservation Climate Adaptation	
41	Sopheia Edghill	WWF Guianas	sedghill@wwf.gy
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42	Salomon Diaz Mondragon	SEMARNAT, Mexico	salomon.diaz@semarnat.gob.mx
43	Shane Young	Belize Audubon Society	marineparks@belizeaudubon.org
44	Pieter Van Baren	WWF Netherlands	pieter@wwf.nl
45	Bob Glazer	GCFI, Florida, USA	Bob.glazer@gcfi.org
46	Karen	Government Antigua & Barbuda	?
47	Anderson	Barbuda	?
48	Brian		?
49	Allen	Belize Fisheries Department	?
50		Grenada	?

ANNEX 3. Photographs



MSP / DSS Workshop pictures

- A. Participants at the beginning of the workshop
- B. Morning working group 1
- C. Morning working group 2
- D. Participants at the afternoon working groups
- E. Morning working group 3
- F. Morning working group 4
- G. Afternoon working group 2
- H. Afternoon working group 3
- I. Afternoon working group 1