IUCN, SPAW-RAC, CaMPAM

Report of the workshop on resilience of marine protected areas to Climate – Saint Martin, FWI – 28-29 November 2013

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INTRODUCTION

Convened in Saint Martin, FWI, on the 28th and 29th of November 2013, and organized by IUCN, the SPAW-RAC and CaMPAM with funding provided by the French Aid Agency, the workshop aimed at building MPA local and national capacities to increase the resilience of the coastal marine environments to climate change through the strengthening of regional cooperation, and at exploring the development of regional action plan to that purpose.

Invited participants were primarily managers or senior officers of marine protected areas from the EU overseas territories in the Caribbean as well as from neighbor islands. Experts, of officers of ministries of environment of several Caribbean islands, also attended the workshop. The detailed list of participants is presented in annex to this report.

The expected outputs of the workshop were coming from the following questions:

· **Best management practices-** Which are the management practices that have each of the MPAs represented that consider and address large spatial and time scale threats to coastal environments, including those generated by global climate changes and those generated by local human uses?

· **Sharing lessons-** Which are the best practices that each MPA can share with the other MPAs in the EU territories and other neighbor islands of the Caribbean to address regionally the local and global threats? (joint projects, networking, policy development)

· **Regional approach.** What are the multi-island initiatives that each of the 3 country-led organizations (from the Netherlands, France and UK) are currently implementing that can be applied in, emulated by or coordinated with other islands (EU or non EU countries)?

To that purpose, the workshop was structured as a series of interactive discussion sessions, following a first set of key presentations made in the first morning (see annex 2 for the detailed agenda).

I. CONTENTS

1. Introduction and overview of Climate Change

The introduction of the workshop stressed the importance of identifying the needs at the site, national and regional level in order to develop common actions to better assist MPA managers, practitioners and decision makers to raise awareness on the key role of coastal and marine ecosystem resilience for climate change adaptation.

With presentations given by two specialists of the climate change question, the first session was dedicated to an overview and summary on climate change and its expected impact on marine and coastal biodiversity in the Caribbean. Main expected impacts on coastal and marine environment are summarized in the figure 1 below.

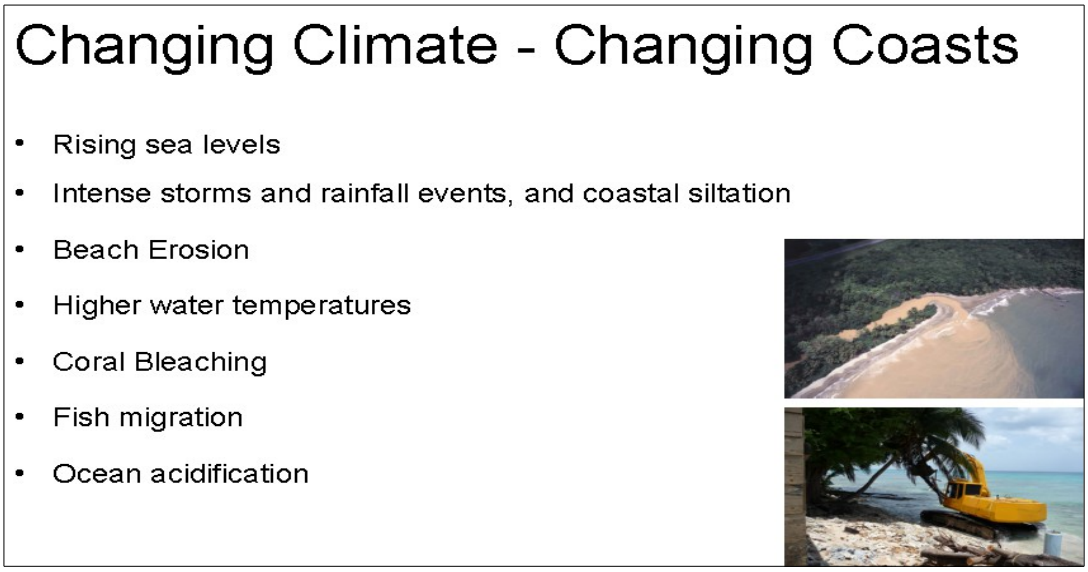


Figure 1. "Changing Climate – Changing coasts"– extracts from Dr. Owen Day's presentation

The islands systems are in the first line confronting the Sea level rise. Several models have been developed about the expected increase of sea level rise, but a few studies also modeled and quantify the submergence consequences. As showed in the figure 2, Caribbean islands appear to be the most vulnerable of all the insular systems of the world, with 8,7% (*i.e.* 63 islands) that are predicted entirely to be inundated according to the 'lighest' scenario of 1 m rise. This study also highlights that a high number of islands will suffer from partial habitat losses, with 165 islands predicted to become half submerged under the same scenario.

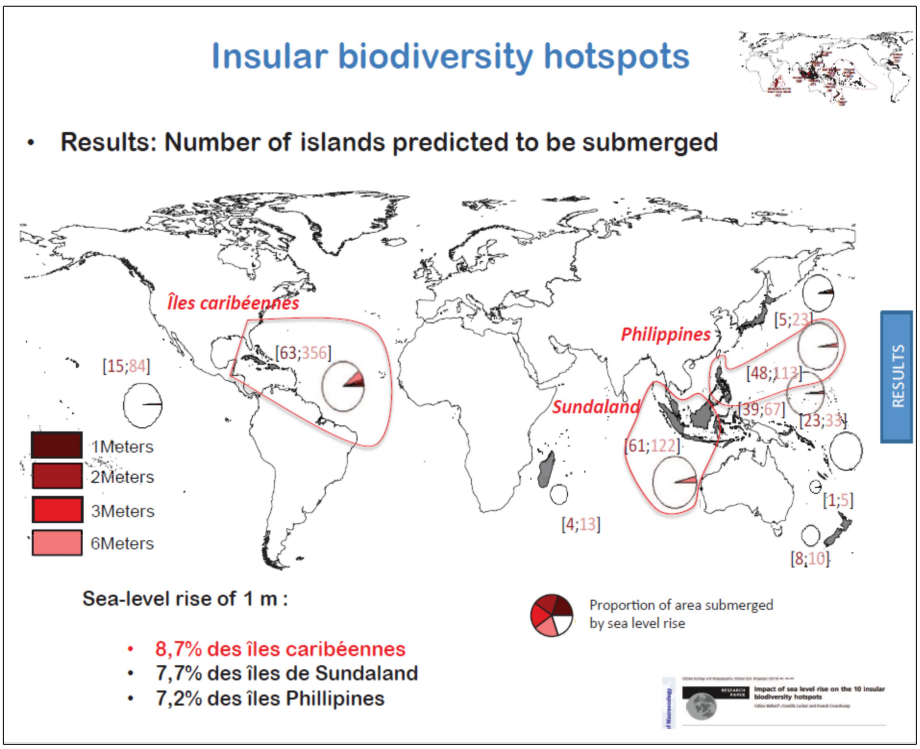


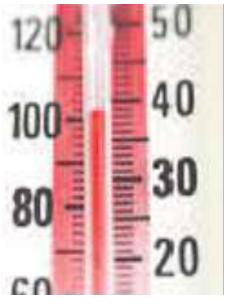
Figure 2 - Effect of Sea-Level Rise on biodiversity hotspots - Extract from Céline Bellard's presentation

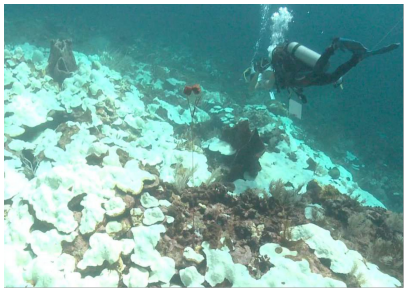
The presentations and documentation can be found on the SPAW-RAC website, under the Climate Change section (http://www.car-spaw-rac.org/?lang=en).

2. Experience sharing between MPA managers

This first discussion session was dedicated to exchanges and feedback on managers' experience of addressing the impacts of climate change in their MPAs, with several presentations that supported the discussion amongst participants on their respective programmes and observations, the lessons learnt, the challenges and the gaps to be bridged.

The main question behind each presentation was about the impacts of climate change within the MPAs, and if/how their managers were addressing those threats or, more generally, what was planed at their national level. Most of the participants witnessed that the impacts of climate change could already be felt in their working spaces and protected areas, with notably the increase of temperature, beach erosion and the bleaching of coral reefs. (table 1)




Despite the common challenges for all small islands, specific challenges were apparent, most of them related to the different management status of MPAs and the socioeconomic context. The Turk and Caicos Islands example illustrated how this territory had to face difficult political situations and corruption issues over the

past years, which weakened even more the political engagement for the protection of the MPA's, in a country where environmental bills were already not considered as top priority in the legislature. Lack of capacities and inadequate funding were also major problems described and shared by several other countries, as well as bad and unsustainable territory management.

Table 1. Impacts of climate change observed in MPAs.

List of commons challenges and problems raised by MPAs managers and workshop participants	
Biophysical observations	***socio economic and governance challenges***
Coral bleaching	
Erosion – beach	coastal development
decrease of herbivours fish	lack of involvement of local stakeholders
Temperature rising	Lack of interest of decision makers and local governments
Sea level rise	fishermen involvement
shoreline evolution	private sector collaboration
Pollution/eutrophisation	

A lack of involvement and concern/awareness about the threats posed by climate change is generally observed, especially at the decision making level, with the private sector and the territory management actors but also within the civil society. In all cases, increasing coastal development is the common and most evident issue, with fisheries management another major concern for most MPAs. All agreed to say that the fishermen community is a major stakeholder to work with for the managers MPAs and, even if it is usually difficult, their involvement and appropriation of a sustainable fishing strategy is crucial for the ecosystem's maintenance and resilience.

If the effects of climate change will directly affect, and are already affecting, the MPAs and more generally the ecosystems of the islands in the Caribbean, there is nonetheless rarely any proper strategy in place to face this threat. Some examples of governments general strategies or action plan against climate change were presented, but they were usually at a draft stage, and not specifically directed to ecosystem or MPAs.

Therefore many participants agreed to say that, even no define strategies are included in the management of their areas, they are however, through their daily tasks and missions, working for the reinforcement and preservation of ecosystems integrity. So, by 'doing their job', managers and actors or marine and coastal conservation are actually helping strengthening the ecosystems resilience capacity which will allow them to adapt to Climate change impacts.

The presentation session was also an opportunity for exchanges of expertise and techniques. Participants could exposed some of their actions, always in connection with ecosystem resilience within their working areas, which opened the way to brain-storming on possible collaboration between islands.
Within the projects described some activities are common to most MPA's, like monitoring of corals, shoreline evolution (figure 3), beach erosion or water temperature measurements. Reef restoration and artificial restoration is also tried in some MPAs, with often positive results as TNC representatives mentioned (95 to 100 % survival rates in American Virgin island) providing that the implantation environment is good and healthy, with low pollution or disturbance;

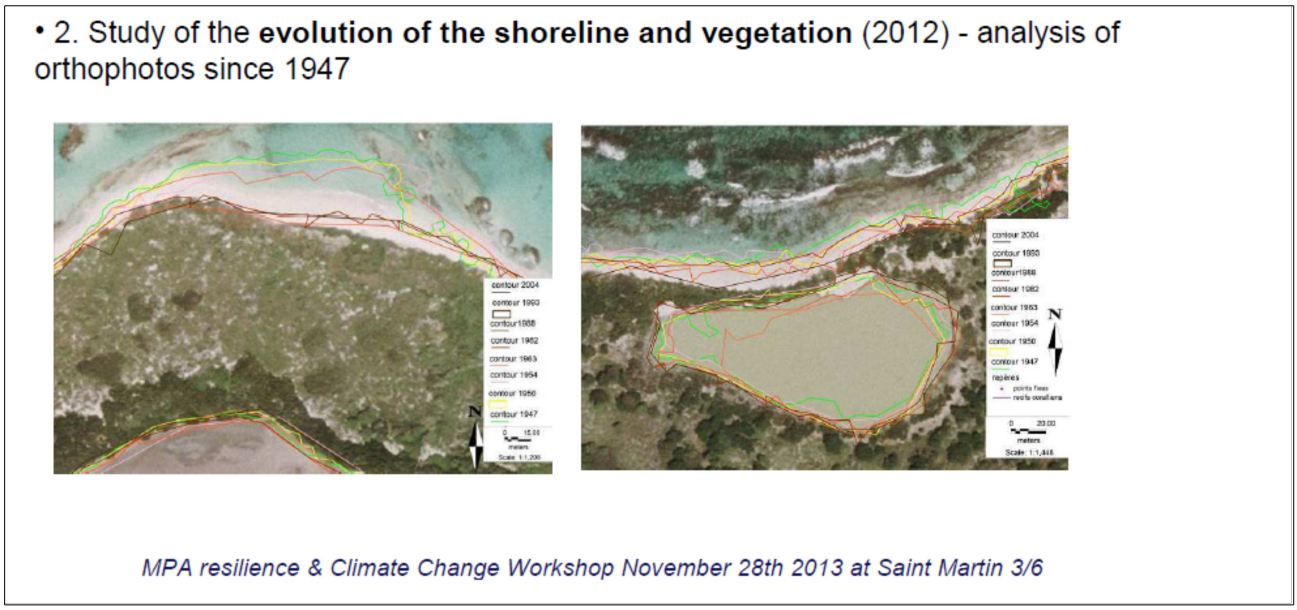


Figure 3. Evolution of the shoreline since 1947 in Petite-Terre, Guadeloupe, France - Extract from Fiona Roche's presentation

Several other specific techniques and methods were also shared, supporting new ideas and will for collaboration. The example of the Conservatoire du Littoral's strategy raised a lot of attention: This French public organization acquires land by private agreement, by preemption in or by donation or legacy. The Conservatoire currently owns and manage 13% of the coastline in the whole French territory – Challenges are important though, especially on an island like St Martin where land prices are high, due notably to an elevated speculation, and exceptionally, when negotiation do not lead to agreements, legal proceedings may be initiated for expropriation.

The example of team roving between the French islands of Guadeloupe also raised a great interest: the different French MPA's staff regularly visit each other to held monitoring sessions on the different reefs sites. Such exchange system helps to strengthen the networks links, allows expertise exchange and systematization of protocols. Participants of the workshop showed enthusiasm to extend this practice between different countries.

The resiliency of networks and the importance of strengthening/developing partnerships were also developed. The alliance of TNC and the Red Cross aims at integrating nature based solution into the latter's communication with communities around the world. In Grenada for example, several stakeholders gathered to implement an action plan on mangrove development as a protection against natural events.

The table below summarizes the main actions implemented by each island and highlights their respective challenges and needs.

Country / Island or Organisation		Examples of actions or strategy	Examples of difficulties / future objectives / needs
Anguilla		Governmental regulations in the MPAs: *mooring permit, no removal/damages on flora and fauna, prohibition of harmful activities*	- Illegal anchoring in sea grass beds - Limited resources causing interruption of regular surveillance/monitoring
Barbados		Collection of Data from 1992 for marine areas (fish abundance and diversity)	- Getting herbivorous fish back (parrot fish) - Engaging communities - Need of Information about nurseries implantation
British virgin islands		Government is taking adaptive measures *(fisheries act, protected area system plan, expansion of mooring buoy systems...)*	- Expand mooring buoy system - Expanded Protected Areas and enhance manage-ment - Comprehensive environmental legislation - Beach management policy
The Netherlands	**Caribbean Netherlands Science Institute**	A scientific platform , with research facilities	- Education and awareness - Multidisciplinary approach (natural, social , political sciences)
	Dutch Caribbean Nature Alliance	Existence of Dutch Biodiversity Database (www.dcbd.nl)	- Planning with stakeholders - Communicate results - Ensure adequate data storage and sound analysis
	Ministry of economic affairs, agriculture and innovation	Existence of a Nature policy plan	
France	**Conservatoire du littoral**	- Purchase of land trust - Assessment of the vulnerability of protected estate to erosion	- Study the influence of climate change on - Know vegetation cover and species - Need of assessing estate vulnerability by (including socio-economic factors
	Réserve de St Martin	- Coral Bleaching response plan - Key adaptation strategy : *« Do your job and do it well ! »*	- Implement an early warning system to monitor climate change impacts on biodiversity - Artificial reefs and coral reefs restoration
	Réserve de Petite-Terre Guadeloupe	- Team roving for monitoring activities - monitoring of the shoreline since 1947	- Need of information on fish nursery/breeding
Turks and Caicos Islands		Awareness about conservation and sustainable development	- Lack of stakeholder involvement and lukewarm political will - Need of legislation reinforcement - Regulation of coastal development - Develop marine habitat maps
US Virgin Islands		- Focus on a resilient network of partnerships: - Work on reef and mangrove solutions to reduce impacts of Climate Change	- Building an integrated view of climate and disaster risks - Developing integrated adaptation and - Disaster risk reduction plans - Facilitating the understanding of climate and disaster risk

3. Overview of the questions, needs and debates related to the impacts of climate change on MPAs

The key concept of capacity of adaption or resilience of ecosystems to face the expected impacts of climate change was at the center of the discussions during the two days: healthy habitats and ecosystems can be strong enough to adapt to the changes, as it has been happening during the natural history, but also to mitigate some expected effects of climate change. We are still in a learning phase regarding the possible impacts and we don't know what exactly is happening or what will happen – Many things have been said and studied, but it now important to act and take measures.

It is crucial to regulate human activities to give ecosystems the necessary elasticity to deal with the impacts of climate change. Therefore the importance of effective management through MPAs and other tools was pointed out to be better prepared for changes.

Ecosystem-based climate adaptation describes the ability of healthy ecosystems to assist in human adaptation to climate change. Indeed, natural ecosystems are potentially more cost-effective than other adaptation options, including hard-engineered solutions and this is particularly important for islands (figure 4 & 5). For instance, healthy mangroves and coral reefs represent a strong protection against climatic extreme events.

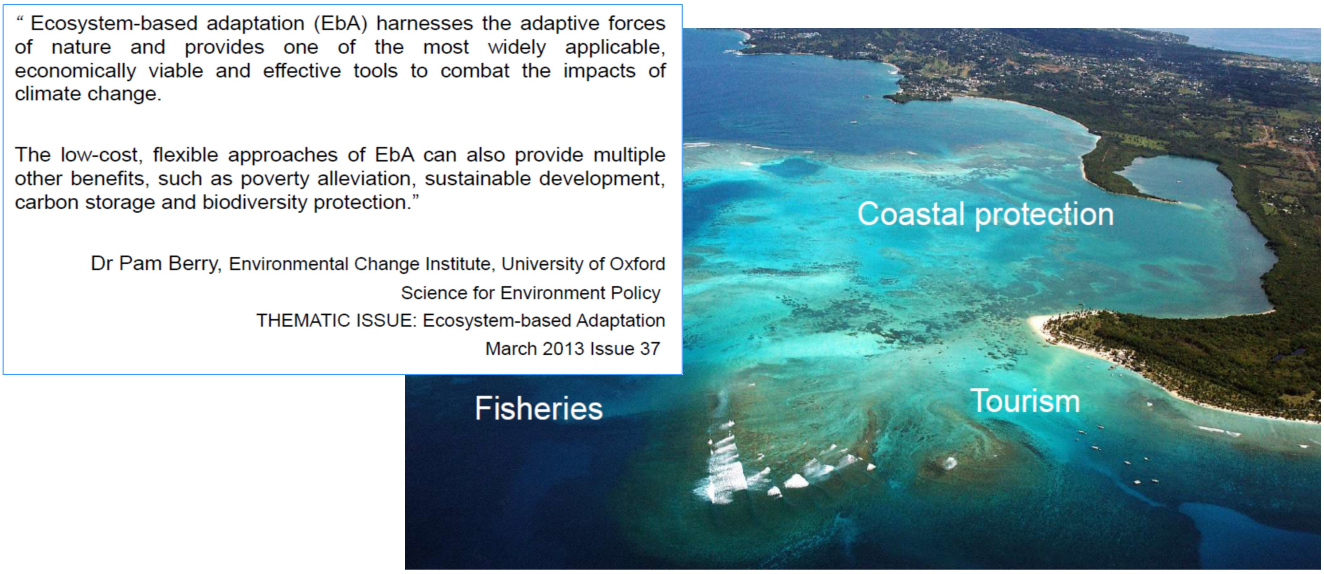


Figure 4. Illustration of Ecosystems services and definition of Ecosystem-Based Adaptation - extract from Dr. Owen Day's presentation.

This concept and the role that ecosystems can play to face climate change impact must be used as a strong message to help raise awareness of economic actors & policy makers. If we can integrate natural ecosystems into governments action plans for risk reduction – and make sure that MPAs are seen as part of the strategy, then more involvement and support will come to preserve ecosystems resilience.

Lami Study, Fiji

Benefit-to-cost ratio for each scenario of adaptation options, and assumed damage avoidance.

Scenario	Benefit-to-cost ratio (FJD)	Assumed damage avoidance
Ecosystem-based options	$19.50	10–25%
Emphasis on ecosystem-based options	$15.00	25%
Emphasis on engineering options	$8.00	25%
Engineering options	$9.00	25–50%

Figure 5. Benefit-to-cost ratio for each scenario of adaptation options, with assumed percentage of damage avoidance[1]

During the workshop, it was said repeatedly that it is the role of the Governments to take climate change into consideration in their strategy: this idea opened a debate on the importance of clarifying the ways to follow in order to include and use the climate change aspects within MPA's Management. Indeed, it was illustrated vividly that MPA managers' do have many and various tasks, interactions, and obligations. What place does the climate change adaptation problematic should have in their work? Is it another task to deal with, through more projects? Can it be a tool to use for the communication with decision makers? How to efficiently integrate this notion?

The participation of MPA's managers could be to give background on ecosystems vulnerability and to convince decision makers to take action. By developing workshops/debates not only with MPAS specialists, but with various stakeholders and decision makers (private sector, politicians, civil society), the mission would be for MPAs managers to act as facilitators for the government of the islands to take action.

This work would then need to go beyond MPAs boundaries. It was stressed there is a need to look at the entire areas, for the benefit of the entire space. Ecosystems' capacity of protection against climate change impacts should thus not concerned only MPAS but the whole territory.

The debate was also redirected on the importance of focusing on how to save MPAs, and how to deal with climate change regarding missions within the MPA, and not so much about convincing other stakeholders.

But MPAs are above all tools, and the debate was refocused on the need of an integrative approach, and the importance of being realistic and pragmatic, with the objective of setting up a concrete action plan. From the exchanges and debates, two lines of work clearly appears for the MPAs managers:

- Communication: how to use climate change impact and ecosystem resilience to convince decision maker to better integrate ecosystem-based adaption solution in their strategies
- Actions: To concretely integrate Climate change notion in MPA's missions by strengthening or developing specific activities and collaborations.

1. *Rao N.S., Carruthers T.J.B., Anderson P., Sivo L., Saxby T., Durbin, T., Jungblut V., Hills T., Chape S. 2013. An economic analysis of ecosystem-based adaptation and engineering options for climate change adaptation in Lami Town, Republic of the Fiji Islands.A technical report by the Secretariat of the Pacific Regional Environment Programme. – Apia, Samoa : SPREP 2013*

The involvement of Fishermen and local community into MPAs management and sustainable use of natural resources were also at the center of the debates. The following points were especially emphasized: the need to engage local fishermen in MPA management, to reduce parrot-fish fishing and ideally to grant fishing exclusive rights to local fishers, in combination with no-take areas, in order to restore the islands coral reef resilience and fisheries, so deteriorated after decades of overfishing.

Figure 6- From the The Caribbean Fish Sanctuary Partnership (C-FISH)

The creation of networks of fish sanctuaries or marine reserves is increasingly being recommended by scientists and fishermen as a practical and effective approach to stop the decline of reef fisheries and coral reefs. The message is spreading and increasing numbers of fishermen in the Caribbean are learning about the benefits that successful fish sanctuaries can generate. In many places like in Jamaica, fishermen are working with their governments to establish new sanctuaries or improve the management of existing parks where regulations were never enforced. [2]

As the protocols followed are not systematically identical, the importance of a collaborative methodology was highlighted, in order to allow a proper overview of the reefs health at a regional or sub regional level. Such harmonization will also help to to understand the biological and ecological exchanges between different areas of the region, for example larva moving patterns, in order to predict the impacts of climate change on population and ecosystems dynamics.

A need of sharing lessons learned and expertise on climate change adaptation tools such as artificial reefs and mangrove and beach restoration was also pointed out. Following the example of the roving teams of the French MPAs, many MPA managers expressed the need of developing this practice to conduct biophysical monitoring in all islands, which will support information and technical exchanges. In particular, French and Dutch participants appeared to be very motivated to start developing such project between their MPAs staff.

2. h*ttp://c-fish.org/about/background-and-strategy/*

II. KEYS OUTCOMES AND RECOMMENDATIONS FOR FUTURE ACTION

Concrete actions were recommended to support MPA managers and government agencies to develop suitable adaptation strategies. Three levels of actions were considered: local, national and regional for a better cooperation/interaction between MPA actors.

1. *Locally*

- To Promote alternative livelihoods for fishers;
- To develop and optimize monitoring of MPAs (biophysical & socio-economics) using roving teams;
- To send the right message to attract support for managers to improve management: climate change is not to be seen as an additional threat but as one of the many facing coastal environment;
- To involve further all kind of stakeholders (fishers, developers, tour operators, etc.) in MPA management

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2. *Nationally/ at the island level*

- MPA managers should provide information to policy makers to improve management;
- To integrate MPA management as part of coastal management (ecosystem based);
- To conduct studies of valuation of ecosystem services (nature capital – economic value);
- To make politicians and decision makers understand the risks (short and long term) and their costs;
- To better communicate the value of good-managed MPAs for climate change adaptation.

3. *Regionally*

- To Promote ban of parrot-fish fishing and highlight the importance of herbivores fish for reef resilience. (using the recommendation from ICRI: adopt conservation and fisheries management;
- To support exchange visits of fishers and policy makers, and monitor the results/impacts of such activities;

- Explore cooperation on benthic/reef monitoring in order to harmonize methods (ex: French and Dutch collaboration with roving monitoring teams);
- Create a space/ platform on SPAW – RAC for information on climate change, workshop report and information dissemination;
- To study further the patterns of connectivity of biological populations and the influence of climate change (Temperature, currents, etc.);
- To assess the impact of herbivores protection in coral reefs environments conservation – conduct a review of existing papers;
- To strength human networks to promote collaboration and coordination of actions to improve resilience of ecological networks;
- To summarize the strengths and weaknesses of EU territories MPAs in order to prioritize actions;

- To study / make an assessment of the role of gender and social stratification in coastal resources management;

- To conduct regional assessment of reefs and beach restoration for ecological enhancement sharing (compilation of best practices);

- To compile information of existing climate change adaptation projects in the Caribbean/

CONCLUSION AND PERSPECTIVES

This workshop can be seen as a first step towards the integration of the problematic of climate change in the management of the MPAs of the Caribbean region – It is urgent to consider the issues and expected impacts coming from global warming, as well as the role that will play the MPAs and ecosystems in mitigating the effects and protecting the territories**.**

The exchange sessions firstly allowed to make an inventory of experiences, which led to do an initial assessment of the needs and challenges that MPAs are facing confronting climate change expected impacts – The workshop outputs will allow to sort what fall within MPAs manager abilities and what is beyond their power / scope – this last point is very important as MPAs are increasingly solicited on these issues.

On the long run, the work done during the two days in St Martin will pave the way towards the development of a strategy / action plan and fund-raising for programs relevant to the issue.

Direct follow-up to this workshop will be to identify ongoing or planned programs / funding in the region, which revolve around the resilience of ecosystems. A centralization work of publications and information will also be necessary. IUCN will go back to its donors to inform them about the real needs that emerged from the workshop.

The SPAW-RAC expressed its commitment to partner with IUCN in developing a program in support of facing climate change for all the Caribbean islands.

ANNEXE 1 – LIST OF PARTICIPANTS – Workshop St Martin, FWI, 28-29 November 2013

Country/island	Name, institution, email
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ANNEXE 2- AGENDA – WORKSHOP St Martin, FWI, 28-29 November 2013

Workshop on MPA resilience to climate change:
How MPA networks can improve marine ecosystem resilience in the Caribbean Region?

St Martin, FWI, 28-29 November 2013

Audience: Marine protected area managers and relevant stakeholders of the EU overseas territories in the Caribbean

Objectives of the workshop: Based on the capitalization of current initiatives and exchanges of experiences, the workshop aims at building MPA local and national capacities to increase the resilience of the coastal marine environments to climate change (including but not restricted to bleaching events) through the strengthening of regional cooperation, and at exploring the development of regional action plan to that purpose.

Procedure: Coral reef managers and resilience experts from different organizations will present relevant project results and experiences; the facilitator will lead the discussion to answer the questions.

Expected outputs
The workshop aims specifically at responding the following questions:

- Best management practices- Which are the management practices that have each of the MPAs represented that consider and address large spatial and time scale threats to coastal environments, including those generated by global climate changes and those generated by local human uses?

- Sharing lessons- Which are the best practices that each MPA can share with the other MPAs in the EU territories and other neighbor islands of the Caribbean to address regionally the local and global threats? (joint projects, networking, policy development)

- Regional approach. What are the multi-island initiatives that each of the 3 country-led organizations (from the Netherlands, France and UK) are currently implementing that can be applied in, emulated by or coordinated with other islands (EU or non EU countries)?

Preliminary agenda

Day 1 / November 28th

9 AM 1. Introduction- overview of climate change and its expected impacts on marine and coastal biodiversity in the Caribbean

- Presentation of the Caribsave works for modelling the transformational impacts and costs of sea level

5:45 PM Side-event: Presentation of the European BEST initiative its third phase and the partnership with AFD for a BEST facility – Carole Martinez

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Day 2 / November 29th

8:30AM 4. Role of MPA for marine ecosystems' resilience to climate change, going beyond the myth for practical actions

- Facilitated discussion on what should be studied, monitored, assessed, and managed, in order to better take into account resilience to climate change in MPAs and MPAs networks?

- The discussion will be structured in a series of geographic scales:
  - locally (e.g including impacts of climate change in MPA management plans)
  - at the island level (e.g land-use planning)
  - regionally (e.g connectivity of marine ecosystems)

10 AM *Coffee break*

10:30AM *5.* ***Next steps: what are we going to do?***

- Identification of priority actions/activities to be developed to assist MPAs managers to better understand and include climate change in their MPAs planning and management frameworks: networks, studies, communication, common projects, etc

12AM 6. Wrap-up and conclusions

12:30PM *Lunch*

2PM Side-event : Presentation of the study of the economic value on Bonaire and discussion on valuation of ecosystem services and biodiversity - Esther Wolfs and Sitjn Schep

5:30 PM Closure of day 2 and the workshop

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Useful links :

To access and download the presentations made during the workshop : http://car-spaw-rac.org/?Workshop-on-MPA-resilience-to,489

To access and download useful information on climate change, its impacts on the marine environment and resilience : http://car-spaw-rac.org/?Documentation-on-climate-change,492. You will find in particular :

- *The CARIBSAVE Climate Change Risk Atlas*
- *RECOMMENDATION on addressing the decline in coral reef health throughout the wider Caribbean: the taking of parrotfish and similar herbivores Adopted on 17 October 2013, at the 28th ICRI General Meeting (Belize City)*
- *The Social Dimension of Ecosystem-based Adaptation - UNEP*
- *MPAs as a one of the tools of ecosystem-based management Taking Steps toward Marine and Coastal Ecosystem-Based Management - An Introductory Guide*
- *Beyond Baselines: Rethinking Priorities for Ocean Conservation*
- *Coral Reef Resilience Assessment of the Bonaire National Marine Park, Netherlands Antilles*
- *A reef manager's guide to coral bleaching*
- *The Reef Resilience Program, by Nature Conservancy*

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