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Tenth Meeting of the Scientific and Technical  
Advisory Committee (STAC) of the Protocol  
Concerning Specially Protected Areas and  
Wildlife (SPA) in the Wider Caribbean Region

Virtual, 30 January – 1 February 2023

**CARIB-COAST: FINAL REPORT**  
**(January 2019 – December 2022)**

*This meeting is being convened virtually. Delegates are kindly requested to access all meeting documents electronically for download as necessary.*

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**ACRONYMS**

ACS	Association of Caribbean States
BRGM	French Geological Survey
CARIB-COAST	Caribbean network for coastal risks prevention related with climate change
CARICOOS	The Caribbean Regional Association for Coastal Ocean Observing
CNRS	National Center for Scientific Research
ERIC	Environmental Research Institute Charlotteville
EU	European Union
GCFI	Gulf and Caribbean Fisheries Institute
IFREMER	French Research Institute for Exploitation of the Sea
IMA	Institute of Marine Affairs
MonaGis	Mona GeoInformatics Institute
ONF	National Office for Forests
RAC	Regional Activities Center
SPAW	Specially Protected Areas and Wildlife
STAC	Scientific and Technical Committee
UNEP	United Nations Environment Programme
UWI	University of West Indies

## CARIB-COAST: FINAL REPORT (January 2021 – December 2022)

### 1. INTRODUCTION

#### 1.1 Background

1. As presented during the last Scientific and Technical Advisory Committee (online, March 2021) and the last Conference of the Parties to the Protocol concerning Specially Protected Areas and Wildlife (SPA-W)<sup>1</sup>, the project “Caribbean network for coastal risks prevention related with climate change” (Carib-Coast) (2019-2021) funded by the EU aimed to pool, co-construct and disseminate monitoring and coastal risk prevention approaches and adaptation to climate change.
2. This project initially designed for three years was extended by one year (until December 2022) and its budget was increased by €102, 324.00 (€3,124,214.59, of which €567,350 were allocated to SPAW-RAC). Due to Coronavirus crisis some actions have been postponed or changed (e.g., meeting, workshop and training).
3. The project was led by the French Geological Survey (BRGM) which closely worked with 10 other Caribbean partners listed below. Six Caribbean territories were directly involved in the project (Guadeloupe, Jamaica, Martinique, Puerto Rico, Trinidad and Tobago, Saint Martin) (Figure 1).



Figure 1. Caribbean territories involved in the Carib-Coast project

#### 1.2 Partners

4. The partners were the following : BRGM, the French National Forest Office (ONF) and the SPAW-RAC in Guadeloupe, the French Marine Research Institute (IFREMER) in Martinique, the French Development Research Institute (IRD) and the French National Centre for Scientific Research (CNRS), the University from the West Indies (UWI) in Trinidad and Tobago, and its Mona GeoInformatics Institute (MonaGis) in Jamaica, the Institute of Marine Affairs (IMA) and the Coastal Protection Unit (CPU) both from Trinidad and Tobago, the Caribbean Regional Association for Coastal Ocean Observing (CARICOOS) in Puerto Rico, and the Association of Caribbean States (ACS) whose secretariat is hosted in Trinidad and Tobago. (Figure 2)

<sup>1</sup> UNEP(DEPI)/CAR WG.42/INF.37



Figure 2. The Carib-Coast network at its first in-person Steering Committee Meeting (Jamaica, 2019)

### 1.3 Objectives

5. Carib-Coast aimed to pool, co-build and disseminate knowledge about monitoring methods, coastal risks prevention and adaptation to climate change in the Caribbean. SPAW-RAC was a key partner involved in the tasks dealing with marine and coastal ecosystems as well as training and communication actions.
6. More information on the Carib Coast website: <https://www.carib-coast.com/en/>

## 2. METHOD

7. The Carib-Coast Project was coordinated by the BRGM and was composed of four (4) work packages led by different partners as detailed below:

**WP 1.** Coordination and Management of the Project, led by BRGM

**WP 2.** Coastal Hydrodynamics Observation and Modeling, led by BRGM

**WP 3.** Coastal Erosion Monitoring, led by ONF

**WP 4.** Decision Support Tools, led by SPAW-RAC

8. SPAW-RAC took the lead on the work package n°4 and was also strongly involved in the work package n°3.

### 3. MAJOR ACHIEVEMENTS (2019 – 2022)

<p><b>WP 1.</b> Coordination and Management of the Project</p>	<ul style="list-style-type: none"> <li>• Participation in the 1st Steering Committee Meeting which officially launched the project (January 2019, Guadeloupe). (Figure 2)</li> <li>• Participation in the 2nd Steering Committee Meeting (October 2019, Jamaica). All the partners were gathered and presented their achievements and ongoing activities. SPAW-RAC participated in the knowledge sharing workshop organized during the Steering Committee Meeting</li> <li>• Participation in the 4<sup>th</sup>, 5<sup>th</sup>, 6<sup>th</sup>, 7<sup>th</sup>, 8<sup>th</sup>, 9<sup>th</sup> and 10<sup>th</sup> Steering Committee meetings held online (June 2020, November 2020, January 2021, June 2021, January 2022, June 2022 and September 2022).</li> <li>• Participation in the final in-person Steering Committee meeting which officially closed the project (October 2022, Guadeloupe) (Figure 3)</li> <li>• Recruitment of the Carib-Coast Project officers (Mike Héliion, July 2019 - November 2020, Marine Didier, December 2020 - November 2021 then Christophe Blazy, April -December 2022).</li> <li>• Involvement in the website design and update (writing of articles, sharing of photos, review and comments). The website has been translated in English and released (<a href="https://www.carib-coast.com/en/">https://www.carib-coast.com/en/</a>).</li> <li>• Involvement in the promotion of the project on social media (<a href="#">LinkedIn</a> and <a href="#">Facebook</a>)</li> <li>• Budget modification to reallocate funds for training workshops, internships and communication actions.</li> <li>• Extension of the project implementation deadline until December 2022.</li> <li>• 9 financial and technical reports prepared for the funder</li> </ul>
<p><b>WP 2.</b> Coastal Hydrodynamics Observation and Modeling</p>	<ul style="list-style-type: none"> <li>• SPAW-RAC was not part of this work package and did not contribute</li> </ul>
<p><b>WP 3.</b> Coastal Erosion Monitoring</p>	<ul style="list-style-type: none"> <li>• Syntheses were written about the three targeted ecosystems (coral reefs, seagrasses and mangroves). Each synthesis gathers a description of the ecosystem in the Caribbean context, the main services provided towards coastal protection and/or erosion mitigation, the major threats, various solutions to tackle these threats and a list of examples of regional initiatives. The syntheses are available in English, French and Spanish on the <a href="#">Carib-Coast's</a> and <a href="#">SPAW-RAC's</a> Websites.</li> </ul> <p>These syntheses are an ongoing work since there is always new information and documents to incorporate (see Annex I)</p> <ul style="list-style-type: none"> <li>• Collaborative work between SPAW-RAC, BRGM and ONF to write a best practices guidebook on coastal risks management for the Caribbean region. This guidebook is focused on knowledge sharing about monitoring methods, coastal risk prevention and adaptation to climate change in the Caribbean, with a strong emphasis on nature-based solutions. It is based on international standards and includes lessons learnt during the project with the pilot sites. This guidebook is meant to be operational and targets</li> </ul>

	<p>decision-makers as well as natural resources managers. It is available in English and French on the <a href="#">Carib-Coast</a>'s and <a href="#">SPAW-RAC</a>'s Websites (see Annex II)</p> <ul style="list-style-type: none"> <li>• Work with ONF and BRGM to identify pilot sites in the French Antilles (Guadeloupe and Martinique). This mainly concerns the coastline monitoring and upper beach vegetation restoration.</li> <li>• Identification of three restauration pilot sites in Caribbean territories in collaboration with ONF (Avril-May 2021) to address coral, mangrove and seagrass restoration. These pilot sites were implemented by NGOs and expert organisations under the supervision by SPAW-RAC (see Annex III):             <ul style="list-style-type: none"> <li>- coral restoration in Trinidad and Tobago by Environmental Research Institute Charlotteville (ERIC) (May 2021-July 2022)</li> <li>- seagrass restoration in Puerto Rico by Protectores de Cuencas (August 2021-July 2022)</li> <li>- mangrove restoration in the Bahamas by Perry Institute for Marine Sciences (July 2021 – September 2022)</li> </ul> </li> <li>• Different tasks were performed regarding the Global Coral Reef Monitoring Network (GCRMN-Global and the Caribbean node). Contribution to write the Chapter 12 of the “Status and Trends of the Coral Reefs in the World : 2020” report published in 2021<sup>2</sup>. Participation in the Global GCRMN meeting (February 2020, Bangkok and March 2022, Monaco). Co-organization and co-funding of the GCRMN-Caribbean Steering Committee meeting (January 2020, Bonaire) as well as organization of an online GCRMN-Caribbean Steering Committee Meeting (August 2022).</li> <li>• Continuous discussion with coral experts of the Caribbean to set up a regional database for the GCRMN-Caribbean node and facilitate the writing of the next GCRMN Status and Trends of the Coral Reefs in the World report</li> <li>• Involvement in the SPAW STAC Working Groups (2020) dedicated to “Species” and “Sargassum”.</li> </ul>
<p style="text-align: center;"><b>WP 4.</b> Decision Support Tools</p>	<ul style="list-style-type: none"> <li>• Presentation of the project during the 4th Caribbean Initiative Conference (May 2019, Dominican Republic) and the 72th Gulf and Caribbean Fisheries Institute Conference (GCFI 72) (November 2019, Dominican Republic) (see Annex IV)</li> <li>• Presentation of the key results of the Carib Coast’s restoration pilot sites during the 75<sup>th</sup> GCFI Conference (November 2022, Florida, USA). (see Annex IV)</li> <li>• Collaboration with an intern concerning the production of communication tools in three languages, mainly posters and short videos targeting the general public. The objective was to disseminate knowledge about coastal protection services delivered by marine and coastal ecosystems, threats to them and how it is possible to participate in their protection in the daily life. In total six posters and sixteen short videos were produced. (see</li> </ul>

2 Status and Trends of the Coral Reefs in the World: 2020 - Chapter 12. Status and trends of coral reefs of the Caribbean region : <https://gcrmn.net/wp-content/uploads/2022/05/Chapter-12.-Status-and-trends-of-coral-reefs-of-the-Caribbean-region.pdf>



	<p>Annex V)</p> <ul style="list-style-type: none"> <li>• Participation in the development of the 6 minute-movie Carib-Coast project with the other partners to showcase the work done during the project. SPAW-RAC contributed on the second and third axis of this movie, respectively dedicated on coastal monitoring and implementation of solutions to mitigate coastal erosion, as well as development of decision-support tools and raising awareness effort. Several testimony videos were collected by SPAW-RAC on the pilot projects and shared with the movie maker. This movie is available in English and French on the Carib-Coast's website : <a href="https://www.carib-coast.com/en/">https://www.carib-coast.com/en/</a> (see Annex V)</li> <li>• Training workshop implemented during the 2nd Carib-Coast Steering Committee meeting (October 2019, Jamaica). It focused on the GCRMN-Caribbean guidelines for coral reef monitoring and on seagrass monitoring guidelines as developed by some partners.</li> <li>• Organisation and participation in the "Coral Reef and Human Dimensions Monitoring in the Mesoamerican Reef Socio-economic Assessment Workshop" (Honduras, December 2019) in the framework of the NFWF II Project.</li> <li>• Participation in a workshop on mangrove restoration (November 2019, Guadeloupe). This event gathered French mangrove experts from the Caribbean.</li> <li>• Co-organisation and participation in a hybrid international workshop on mangrove restoration (Bonaire, October 2021) following a call for proposals launched by SPAW RAC in 2020. Involvement of more than 60 mangrove experts and practitioners from over 40 different countries from the Caribbean, Europe and US (Annex VI).</li> <li>• Financing of two awareness events in Secondary Schools (over 50 school children) in Tobago via the contractor ERIC. The presentations dealt with the importance of coral reefs in mitigating effects of coastal erosion and supporting climate change adaption</li> <li>• Collaboration with the <a href="#">Adaptom Project</a> to exchange experience and knowledge about ecological restoration and participate in the inventory of pilot sites in Guadeloupe et the Caribbean using nature-based solutions (June 2022).</li> <li>• Preparation of a public tender (May-June 2022) to organise a GCRMN-Caribbean integrated coral reef monitoring workshop (biophysical and socio-economical) in Tobago (June 2022). The Call was not successful due to incapacity to find a contractor and trainers to implement the workshop in September 2022.</li> </ul>
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#### 4. HIGHLIGHTS

##### General :

- 4-year project 2019-2022 funded by EU
- 11 partners and 6 Caribbean territories
- 5 regional meetings with several workshop sessions organized in 2019, 2021 and 2022
- Development of modelling tools to monitor coastal hydrodynamics and manage coastal risks associated to coastal erosion, storm surges, hurricanes, sea level rise and other phenomenon linked to climate change
- Development of tools to map and monitor ecological status of coastal ecosystems
- Experimentations on ecological restoration in the Caribbean
- A network of highly involved stakeholders around the Caribbean region dedicated to coastal risk management and monitoring

##### Majors CAR SPAW outputs:

- Implementation of 3 restoration pilot sites across the Caribbean
- Organisation of 2 regional workshops
- Participation to 4 regional conferences
- Publication of 3 syntheses on coastal ecosystems and 1 guidebook on best practices
- Development of 5 posters, 16 short videos and 1 movie
- Involvement of the GCRMN-Caribbean network in the Carib-Coast project (workshop, conferences, report writing)



Figure 3. The CARIB-COAST network during the final in-person meeting in Guadeloupe to present the results of the project to over participants (left), followed by a field visit on a restoration pilot site (right)

#### 5. CONCLUSION

9. Carib-Coast is an active and operational transboundary network for coastal risks related to climate change.
10. Carib-Coast generated a lot of interest each time it was presented because it illustrated the link between nature conservation and the safety and well-being of populations.

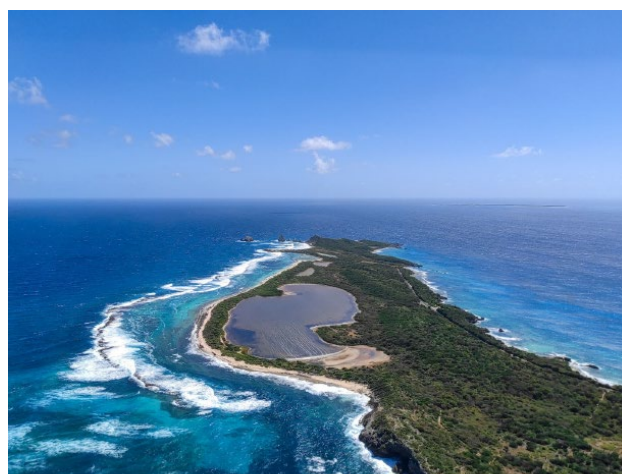
- 11.** The results and tools developed have been promoted during the project at regional and international levels and are available online on several languages. They will benefit all actors of the Caribbean region to better address risks linked to coastal erosion and climate change adaptation.



## ANNEX I: Synthesis on ecosystems: mangroves, corals and seagrass beds



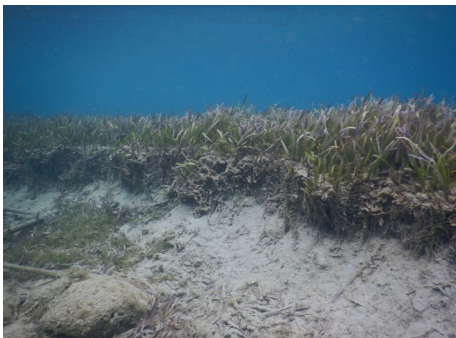
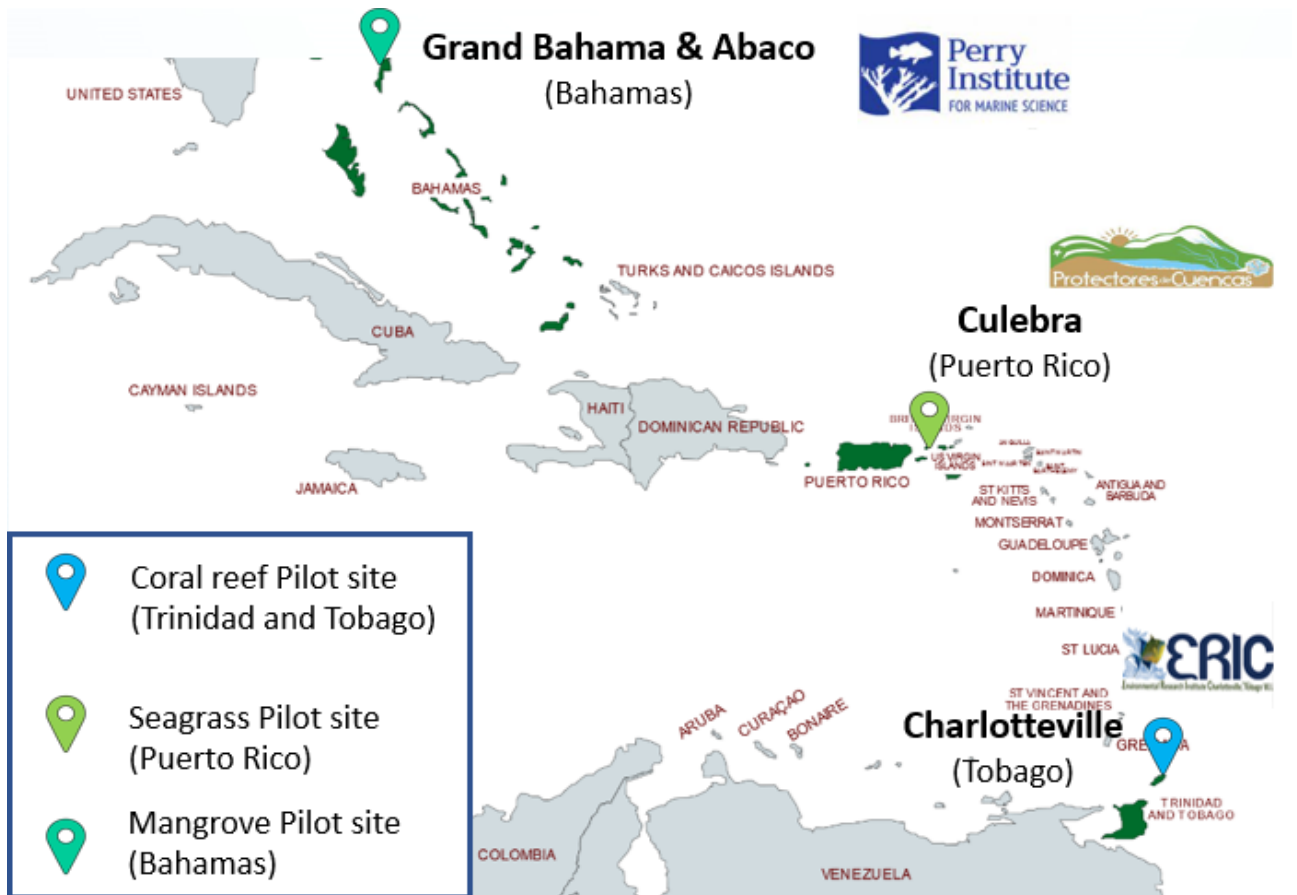
## ANNEX II: Best practices guidebook on coastal risks management for the Caribbean region



### CARIBBEAN HANDBOOK ON COASTAL RISKS MANAGEMENT

Observations, management and nature-based solutions

### ANNEX III: Restoration pilot sites in the Caribbean region





ANNEX IV: Presentations during GCFI Conferences in 2019 and 2022

GCFI 72th (2019)

**Caribbean network for the prevention of coastal risks related with climate change**

In 1983, the Caribbean nations adopted the Cartagena Convention, the only regional and legally binding agreement on environment. Among the three protocols stemming from the Convention, the **Specially Protected Areas and Wildlife (SPAW)** protocol is the one dedicated specifically to the conservation of the region's biodiversity. This Protocol has been ratified by 17 countries. The SPAW-RAC (Regional Activity Centre) is in charge of the implementation of SPAW protocol's activities.

**Caribbean Terrestrial**  
The Wider Caribbean Region (WCR) is home to many natural threats, among which hurricanes are one of the most important. Due to climate change, these events will become more frequent. However, their strength should increase. Combined with sea level rise, our coasts will face an accelerating erosion as well as more submergence risks. In this context, the CaribCoast project, led by the BRGM, has been launched late 2018. It aims to pool, build and disseminate knowledge and surveillance approaches, coastal risk prevention and adaptation to climate change in the Caribbean.

**Results**  
Synthesis on coastal and marine ecosystems: Focus on their roles for coastal protection

**Best practices:**  
Protect / Restore Ecosystem Based Management  
Engage small pilot project  
Monitoring / Lesson learnt  
Go on bigger project

**Coral Reefs**  
Coastal protection +++  
- 21% Caribbean coasts  
- 97% of wave energy absorbed  
- Up to 2 billions \$ of economy per year  
Best is: Miking coral cover  
Key herbivores  
Erosion mitigation ++  
Ecosystem resilience  
Sediment stabilization  
Sand production  
Climate regulation +  
Carbon sink  
Engage small pilot project  
Monitoring / Lesson learnt  
Go on bigger project

**Upper Beach vegetation**  
Coastal protection ++  
- Natural barrier against extreme climatic events  
Best is: Diversity / Density  
High  
Climate regulation ++  
High carbon sink  
Erosion mitigation ++  
Sand trap and stabilization  
Run erosion mitigation  
Engage small pilot project  
Monitoring / Lesson learnt  
Go on bigger project

**Mangroves**  
Coastal protection ++  
- 15 to 35% of wave energy absorbed  
- Wind absorption  
- Flood mitigation  
Best is: Higher species  
Thalassia testudinum  
Erosion mitigation ++  
Sediments stabilization  
Soil vertical and horizontal growth  
Sea level adaptation  
Engage small pilot project  
Monitoring / Lesson learnt  
Go on bigger project

**Next steps**  
Pilot sites implementation  
Ecosystem resilience  
Translation and sharing  
Soft solutions guide production  
Ecosystem scientific imagery  
Webinar release  
Training workshops  
Mangrove restoration  
Coral reefs monitoring  
Communication strategy  
Communication actions

**Pilot sites**  
Restoration methods  
Surgeon video tracking  
Topographic survey  
Public challenge  
Water levels  
Wave data collection  
Hydro-morphological monitoring  
Video coastal monitoring  
Beach & mangrove survey  
Soil water management  
& vegetation monitoring

GCFI 75th (2022)

**CARIB COAST PROJECT - CARIBBEAN NETWORK FOR THE PREVENTION OF COASTAL RISKS RELATED WITH CLIMATE CHANGE**

- Financing: EU funded project (2019-2022) - €3 504 235
- 11 partners: BRGM (Coordinator), ONF, SPAW-RAC, BREMER, IRD, CNRS, UWI of Trinidad and Tobago, MonaGIS, IMA, CARICOM, ACS
- Locations: 8 Caribbean territories (Guadeloupe, Jamaica, Martinique, Puerto Rico, Trinidad and Tobago, Saint Martin)
- Objective: pool, build and disseminate knowledge and surveillance approaches, coastal risk prevention and adaptation to climate change in the Caribbean.
- Organization: 4 Work Packages (WP)
  - WP 1: Coordination and Management of the Project, led by BRGM
  - WP 2: Coastal Hydrodynamics Observation and Modeling, led by IRD
  - WP 3: Coastal Ecosystems Monitoring, led by ONF
  - WP 4: Decision Support Tools, led by SPAW-RAC

**UNEP**  
Coastal Protection  
Coastal Ecosystems  
Coastal Ecosystems

**CARIBCOAST**

**Coastal Protection**  
Coastal Ecosystems  
Coastal Ecosystems

**Coastal Protection**  
Coastal Ecosystems  
Coastal Ecosystems

**Coastal Protection**  
Coastal Ecosystems  
Coastal Ecosystems

**MARINE ECOSYSTEMS RESTORATION IN THE CARIBBEAN WITH NATURE-BASED SOLUTIONS, THE CASE STUDY OF THE CARIB-COAST PROJECT**

**Seagrass meadow Restoration (Puerto Rico)**  
*Tamarindo Beach, Culebra Island*  
"Implementation of best management practices to restore local seagrass populations"

- Erosion of eroded beach after 10 years of beach nourishment (2017)
- Mean retreat of 2.4 meters coastal erosion (2017-2021)
- Stabilization of the beach (c. 700 m<sup>2</sup>)
- 100% of the beach area (c. 700 m<sup>2</sup>)
- 2000 m<sup>2</sup> of seagrass meadow (c. 1000 m<sup>2</sup>)
- 1000 m<sup>2</sup> of seagrass meadow (c. 1000 m<sup>2</sup>)
- 1000 m<sup>2</sup> of seagrass meadow (c. 1000 m<sup>2</sup>)

**Mangrove Restoration (Bahamas)**  
*Grand Bahama & Abaco*  
"From unenhanced forest management to nature-based solutions"

- 2000 m<sup>2</sup> of mangrove species in Grand Bahama (c. 2000 m<sup>2</sup>)
- 2000 m<sup>2</sup> of mangrove species in Grand Bahama (c. 2000 m<sup>2</sup>)
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**Coral reef Restoration (Tobago)**  
*Booby Reef, Charlotteville*  
"From an eroded reef to a coral distributed in an enhanced reef and strategic protection"

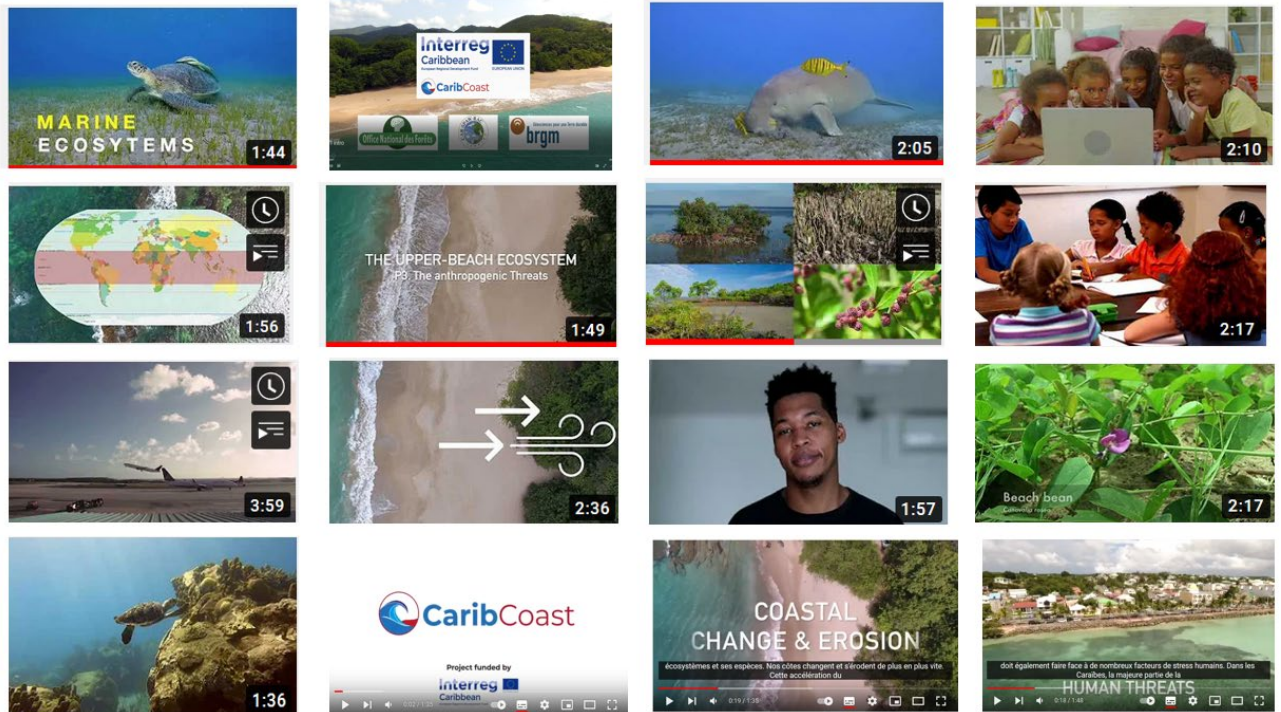
- 1000 m<sup>2</sup> of coral reef restoration (c. 1000 m<sup>2</sup>)
- 1000 m<sup>2</sup> of coral reef restoration (c. 1000 m<sup>2</sup>)
- 1000 m<sup>2</sup> of coral reef restoration (c. 1000 m<sup>2</sup>)
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- 1000 m<sup>2</sup> of coral reef restoration (c. 1000 m<sup>2</sup>)

**Upper Beach Vegetation Restoration (Guadeloupe)**  
*Anse Maurice*  
"From an eroded beach to a beach with an enhanced vegetation coverage"

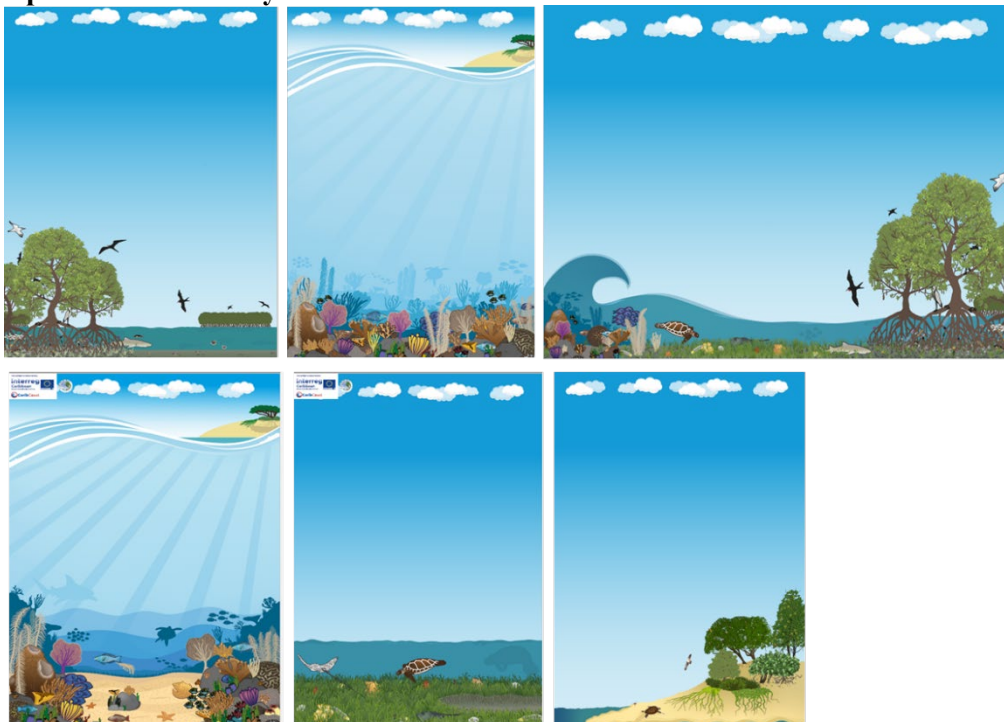
- 1000 m<sup>2</sup> of upper beach vegetation restoration (c. 1000 m<sup>2</sup>)
- 1000 m<sup>2</sup> of upper beach vegetation restoration (c. 1000 m<sup>2</sup>)
- 1000 m<sup>2</sup> of upper beach vegetation restoration (c. 1000 m<sup>2</sup>)
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## ANNEX V: Production of communication support material

16 short videos available online on SPAW-RACs Youtube Channel (with English, French and Spanish subtitles): <https://www.youtube.com/channel/UCmwUIYIo2hn2zPFQVPrSTAg/videos>



## 6 posters sur les écosystèmes marins et côtiers





**1 Carib-Coast movie (6 minutes):**



**ANNEX VI: Organisation of a regional mangrove restoration workshop (Bonaire, 2021)**

