Translation of the article: https://www.wedemain.fr/articlesponso/sauver-les-mangroves-et-recifs-le-defi-du-siecle-pour-les-caraibes/

Conserving coastal ecosystems: the challenge of the century for the Caribbean

Mangroves are a vital barrier against hurricanes and floods, but these coastal environments are threatened by human activity as well as increasingly intense storms and droughts caused by climate change. A pioneering scientific project is bringing together researchers from around the world to better understand and protect these crucial ecosystems.

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Picture an environment home to hundreds of land and sea species, where vibrant-plumaged parrots perch in the branches and peer down at marauding barracudas and giant groupers in the shallow coastal waters. This is a mangrove forest in Cuba, but similar scenes can be found in Costa Rica, the West Indies and elsewhere along the coasts of the Caribbean and Central America.

While these spectacular spots teeming with life attract tourists, more importantly, these coastal ecosystems are irreplaceable reservoirs of biodiversity and critical bulwarks against erosion and storm surges. The same is true for coral reefs and seagrass beds,

whose ecosystems are closely linked to mangrove forests. These coastal ecosystems also provide vital services such as carbon sequestration.

Global warming: a threat with disastrous effects that are difficult to predict

Extreme climate events from hurricanes to droughts have been inexorably multiplying and amplifying over the past 40 years due to global warming. The 2021 Atlantic hurricane season alone caused around 70 billion dollars of damage and 150 deaths in the North Atlantic. This toll would have been much higher without the ocean's natural barriers against waves and floods: mangroves, coral reefs, and seagrass beds.

But how long can these invaluable coastal and marine ecosystems withstand the onslaught of climate change? Will they be able to adapt to the increase in frequency, intensity, and duration of unprecedented extreme weather? If so, how? Scientists do not yet know.

CORESCAM: studying the impact of extreme events in the Caribbean

To try to answer these questions, an innovative research project is underway, supported by the Climate & Biodiversity Initiative of the BNP Paribas Foundation. Bringing together international scientists from different fields, CORESCAM (Coastal Biodiversity Resilience to Increasing Extreme Events in Central America) is carrying out the first global study on the impact of extreme events on the coastal and marine ecosystems of the Caribbean, particularly mangroves and coral reefs. Working in transdisciplinary teams (ecologists, oceanographers, climatologists, etc.), these researchers are analysing past and current scientific data to better predict the vulnerability and future resilience of these ecosystems. The results have a very concrete objective: helping governments in the region develop risk management plans and guiding them in the creation of protected areas.

Rosa Maria Román-Cuesta, an ecologist at Wageningen University & Research in the Netherlands and an expert on tropical forests, is the project coordinator: "Like the polar zones, the region is a natural laboratory for global warming," she explained in the Spanish daily *El Paìs*. "If we want to understand how the intensification of extreme events might affect the resilience of ecosystems and human societies, Central America is the ideal place." It is also one of the areas where action is most urgently needed. "Nowhere else in the world do so many climate and geological risks converge in a biodiversity hotspot that is also exposed to severe droughts and pressures such as mass tourism."

20% of mangrove ecosystems lost in 15 years

Coastal and marine environments are under threat from expanding development as hotels, ports and motorways eat into natural areas. According to the UN, 20% of the

world's mangrove habitats have been destroyed in the last 15 years. Central America and the Caribbean are no exception. Yet this short-term economic strategy sooner or later ends up backfiring. A case in point was the devastating flooding in 2020 on Isla Holbox, a tourist paradise off Mexico's Yucatan Peninsula. A similar logic occurs in the fishing industry, which continues to increase its catch even as stocks of fish decline due to a range of pressures. This short-term thinking can have long-term consequences, as millions of people depend on the habitats and resources being relentlessly depleted. Climate change is adding to these pressures.

This makes the work of the CORESCAM project all the more urgent: the researchers aim to translate the results into concrete policy as quickly as possible. For Victoria Ramenzoni, an environmental anthropologist at Rutgers University in the United States, existing examples of successful action can serve as a model: "Cuba is a clear case of a country at the forefront of environmental issues." The island's land-use planning is based on scientific data collected in the field, considering how natural resources (fauna, flora, water, etc.) are affected by climate change and the tourist industry.

The need to take the long view for the environment

To inform policymakers from the countries concerned, the findings from this international study will be presented in a series of workshops over the course of the project. Another aim is to raise public awareness, by mounting exhibitions, diffusing documentaries, and visiting schools throughout the region to communicate science-based facts and solutions. "To regenerate ecosystems and mitigate climate change, we need long-term policy that is not affected by changes in government every four years, as well as a commitment to science," emphasizes Rosa Maria Román-Cuesta.

The project directors of CORESCAM also stress the need to integrate coastal ecosystem conservation into post-COVID recovery plans and hurricane reconstruction programmes. "To be sustainable and effective in the long term, economic recovery must take into account the interactions between ecosystem degradation, extreme events and the impact of development," argues Victoria Ramenzoni.

The 2022 Atlantic hurricane season (mid-May to late November) was predicted by US atmospheric agencies to break records, but in the end its intensity fell within the norm: 14 named storms, eight of which became hurricanes. Despite this, it was one of the costliest hurricane seasons on record, mostly due to Hurricane Ian, which hit Cuba as a category 3 hurricane, before strengthening into a category 4 before making landfall in Florida and causing extensive damage. Forecasters expect the 2023 season to be below average in intensity: if so, this will be a reprieve for populations and for Caribbean coastal ecosystems alike, whose long-term survival hangs in the balance.

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