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SUMMARY

Index

Editorial **03**

Training Course on Marine Spatial Planning - CPPS **04**

Regional Program for Mangrove Conservation
In the Southeast Pacific **08**

Blue Carbon Workshop **12**

Blue Carbon, Mangroves and Public Policy **15**

Courses; Wetland Management Plans with Climate Change Focus **19**

EDITORIAL

To our readers:

Welcome to the new edition of InfoWetland August 2017. Keeping a renewed format, we invite you with much enthusiasm to walk through the pages of our beloved magazine. We hope that its content captures your interest.

In this number we present the initiatives in blue carbon and the courses that CREHO has given with thematic areas of interest in mangroves, adaptation, and assessment of climate change, including biological assessments and experiences that provide the tools and teachings replicable in the region.

In addition, CREHO publishes the interactive digital information of InfoWetland, which reiterates the commitment directed to the region in order to promote, inform, educate, and support the conservation and rational use of our wetlands, with the full participation of human populations , which contribute to strengthen their capacities.

Finally, InfoWetland offers a space for publishers to promote their works and developed initiatives, hoping to encourage them to share information, thus stimulating the participation of new actors that carry out important activities in the management and rational use of wetlands in the Americas.



Training Course on Marine Spatial Planning CPPS

20H PANAMA

SUMMARY

On July 23rd and 24th, the CREHO Ramsar Center along with CPPS were pleased to hold the Training Course on Marine Spatial Planning. The event was conducted by two international experts:

- Alejandro Iglesias, Physical Geographer. Program Specialist of the Intergovernmental Oceanographic Commission, UNESCO
- Marcia Pérez, GIS Specialist, Ramsar Regional Center, CREHO

The course was directed to a group of mangrove experts (GEM) of the South Pacific Commission (CPPS), with the objective to know the public processes and the distribution of human activities in the marine areas for ecological, economic, and social purposes that have been specified through political processes.

Within the specific objectives addressed in the course, one was to provide participants with basic knowledge on coastal marine areas necessary for a good implementation of marine space management (OEM), accompanied by theoretical concepts from the OEM. Principles of OEM applications were also infused into the participants' daily activities as stakeholders (public citizens or participating citizens). Another purpose was to empower participants to analyze the advantages and disadvantages of decisions made or to be made in the light of OEM processes.

Skills acquired by participants:

- Apply knowledge on OEM concepts in planning processes in coastal areas.
- Apply OEM-related methodologies for the formulation of management plans, zoning of coastal regions, and organization of inter-institutional coordination schemes.
- Apply methods of approach with local actors (Communities and Institutions) in OEM processes.
- Exchange experiences regarding OEM issues.
- Formulate and develop projects related to OEM.



Discussion of issues about public participation processes in marine spatial planning as well as the importance of involving all stakeholders by raising awareness of actions to facilitate the involvement of key stakeholders, especially in those sectors that closely depend on the regional economy and national system.

Additionally, topics such as the current conditions of the marine environment, biological and ecological habitats, oceanography, physical environment, and spatial and temporal distribution of human activities were also addressed, as well as the identification of conflicts and compatibilities in the area. Available sources with data and information were provided.

At the end of each day, a practical exercise was proposed, which consisted in the preparation of a marine spatial plan that included topics such as the management of measures and criteria for the OEM, Space, and components of participation. Lastly, there was an interactive session among actors.



Regional Program for Mangrove Conservation in the Southeast Pacific

Fernando Félix
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Mangroves are highly productive ecosystems located in tropical coastal areas and subtropical regions. They are places of reproduction for a large variety of fish, mollusks and crustaceans holding important fisheries in the countries of the region.

Mangroves provide a wide range of benefits that contribute to the development of coastal communities. They are vital to ensure food security to local populations, they are the habitat of a wide range of biological species, and provide ecosystem services such as forest products (timber and non-timber), areas for fishing and harvesting, and carbon storage. In addition,



mangroves are key areas because they protect the coastal strip by preventing and mitigating the effects of coastal erosion and climate change.

Despite the ecological, cultural, social, and economic importance of mangroves for the well-being and development of coastal communities, in the last decades, countries that have this type of ecosystem have experienced an accelerated decrease in mangrove surface and ecosystem deterioration as a result of different human activities, including urban development, aquaculture, dredging, pollution, and so on. These practices threaten the long-term provision of ecosystem services that people receive from mangroves.

In November 2015, the Meeting of the Parties to the Lima Convention commissioned the implementation of the Regional Environmental Plan for Mangroves (PAR-Mangrove) to the Permanent Commission of the South Pacific (CPPS), Executive Secretary of the Plan of Action for the Protection of the Marine Environment and Coastal Areas of the Southeast Pacific. Chile, Colombia, Ecuador, Panama and Peru adopted the Regional Action Plan for the Conservation of Mangroves in the Southeast Pacific (PAR-Mangroves), an initiative to which Costa Rica has also doubled.

The general objective of PAR-Mangroves is to help participating Governments strengthen policies and programs for the protection, recovery and sustainable use of mangroves in the region.



The Plan seeks to provide an appropriate framework for the implementation of regional cooperation activities based on respect for the sovereignty and priorities of participating Governments in order to ensure the long-term flow of environmental services, protection, recovery and The sustainable use of mangroves. PAR-Mangroves includes seven components: 1) updating legal and economic policies and instruments; 2) support for research and monitoring; (3) measures for the protection of mangroves; 4) promotion of sustainable use and productive alternatives; (5) support for the recovery and restoration of mangroves; 6) promotion of environmental education and communication; and 7) management for resource mobilization.



In order to implement and follow-up the PAR-mangroves, the Mangrove Specialists Group (GEM) was created in December 2016, composed of specialists from the region of recognized capacity and experience in matters related to the conservation and management of coastal mangroves and wetlands. The GEM aims to provide technical and scientific assistance to the Executive Secretariat of the Southeast Pacific Action Plan for the implementation of measures and monitoring of the Mangrove RAP, based on the best scientific information available, taking into account environmental, socioeconomic and environmental characteristics of the participating countries.



The financing of the activities contemplated in the PAR-Mangroves is one of the biggest challenges. To a large extent, this financing must come from the countries themselves through their competent national agencies, as well as the management that can be carried out by the GEM, the CPPS or other key partners. In that sense, the GEF / WWF / CI GEF Mangrove Project "Improving Mangrove Conservation in the Tropical Pacific (ETPS) through the development and implementation of a coordinated strategy at the national and regional levels", designed to be implemented in The region between September 2016 and September 2018 will be one of the main sources of funding for the PAR-Mangroves.



Cross –Training Workshop

BLUE **FOREST**

January 23 - 27, 2017

Blue Forests Cross-Training Workshop was held in Panama City from 23 to 27 January 2017. This initiative is part of the GEF (Global Environment Facility) implemented by UN Environment and executed by GRID Arendal. This global initiative was aimed at exploring the value of blue carbon and related ecosystem services with project sites in Madagascar, Indonesia, Ecuador, Mozambique, the United Arab Emirates, Kenya and Central America. The project addresses major gaps in the knowledge of the capture and storage of blue carbon by marine and coastal ecosystems, such as mangroves, seagrass and marshes, and provides tools for global capture of project results.

The United Nations Environment Program supports Member States to strengthen natural resource management and provide an integrated approach that emphasizes the value of biodiversity and ecosystems for productive sectors and their linkage with human well-being.



The Ramsar Regional Center for the Western Hemisphere (CREHO) who took an active part in this project; Works with partners and countries to strengthen regional networks, build partnerships and cooperation agreements with many institutions and organizations in the Western Hemisphere, and conduct courses and workshops that respond to specific training needs, including challenges related to climate change.

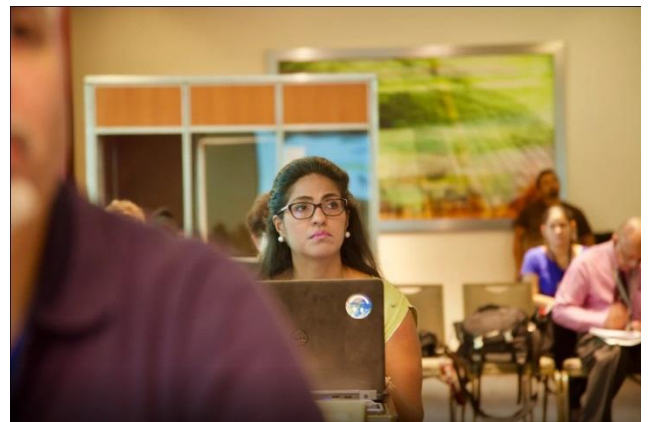
Justification

As we know, these "Blue Forests" - mangroves, seagrass and saline - capture and store carbon through their system and soil. However, when they are degraded or destroyed, carbon that has been stored for centuries is emitted into the atmosphere, becoming a source of greenhouse gases. It is estimated that 1,020 million tons of carbon dioxide are released annually from degraded blue forests.

Blue forests are complex systems that provide numerous ecosystem services, such as coastal protection against floods and storms, support for coastal water quality, and healthy fisheries.



The organization of this workshop in the region sought to educate about these ecosystems and the services they provide so that their value can be integrated into development planning and protection policies.



Objectives

The workshop aimed to help develop a more mature approach to blue carbon / blue forests projects in the region, create synergies between ongoing projects, and improve the exchange of good practices in the region. The workshop examined the application of blue carbon science - carbon science and ecosystem services to improve ecosystem management.





BLUE CARBON, MANGROVES AND PUBLIC POLITICS

SUMMARY

Coastal development and associated human activities have had negative impacts on coastal ecosystems, such as the reduction of mangrove and seagrass coverage, with the consequential loss of environmental services. One of these services, which currently has been recognized due to its importance for mitigation and adaptation to the effects of climate change, capture and storage of organic carbon in seagrass and mangroves, is known as "Blue Carbon" . A recent research shows that, per surface area, mangroves and seagrasses store more carbon than any other terrestrial ecosystem, so their conservation and restoration are recognized as strategies for mitigation and adaptation of the effects of climate change. In the particular case of mangroves, Mexico has the opportunity to contribute to these strategies by having an extension of mangrove that places it in the fourth place worldwide. Although there are estimates of carbon stores in mangroves, the reality is that they are very scarce and there is still no national strategy to determine carbon flows. On the other hand, the conservation and restoration of mangroves constitute a challenge in spite of the protection situation in which they are. There are strategies such as the REDD + program and payment for environmental services, which can be implemented for blue carbon ecosystems. Their implementation is necessary due to the ecological peculiarities of mangroves and seagrass.

Keywords: coastal ecosystems; Seagrass; Ecosystem services.

INTRODUCTION

Chemical elements like carbon, nitrogen, oxygen, phosphorus, among others, are stored in the atmosphere, hydrosphere, and lithosphere, and constantly move between these using different paths and at a different speed. This interaction of elements between repositories and pathways are known as biogeochemical cycles (Mitsch y Gosselink, 2000).

In nature, chemical elements are rarely homogeneously distributed in the reservoirs. There are elements that are more abundant in the atmosphere (nitrogen, oxygen) and others in the lithosphere (phosphorus, sulfur). In addition, they can be found in both their organic and inorganic chemical form. For example, carbon is found in part of organic molecules like carbohydrates and proteins (in plants and animals), but it is also present in its inorganic form as carbon dioxide (CO₂) or bicarbonate in the atmosphere and hydrosphere, (Ciais *et al.*, 2013).

For nature to function correctly, there is a need for a balance between the abundance of elements in its reservoirs and the speed in which they transfer and transform when moving from an organic reservoir to an inorganic one and vice versa.

However, humans intentionally, or non-intentionally, have modified both the reservoirs as well as the speed at which these elements travel. For example, humans have used fertilizers that contain nitrogen and phosphorus to increase agricultural production, but at the same time, non-intentionally, they've contaminated rivers, lakes and oceans with the rest of the non-used fertilizer in the field that is pushed by runoff to water bodies.

In the case of carbon, the reservoirs in the lithosphere, atmosphere, and hydrosphere, as well as the speed of flow, have been altered by human activities such as deforestation, change in the use of soil, burning of fossil fuels, etc. The result has been an increase in the concentration of CO₂ in the atmosphere (Figure 1) to the extent that it affects climate characteristics (Canadell *et al.*, 2007).

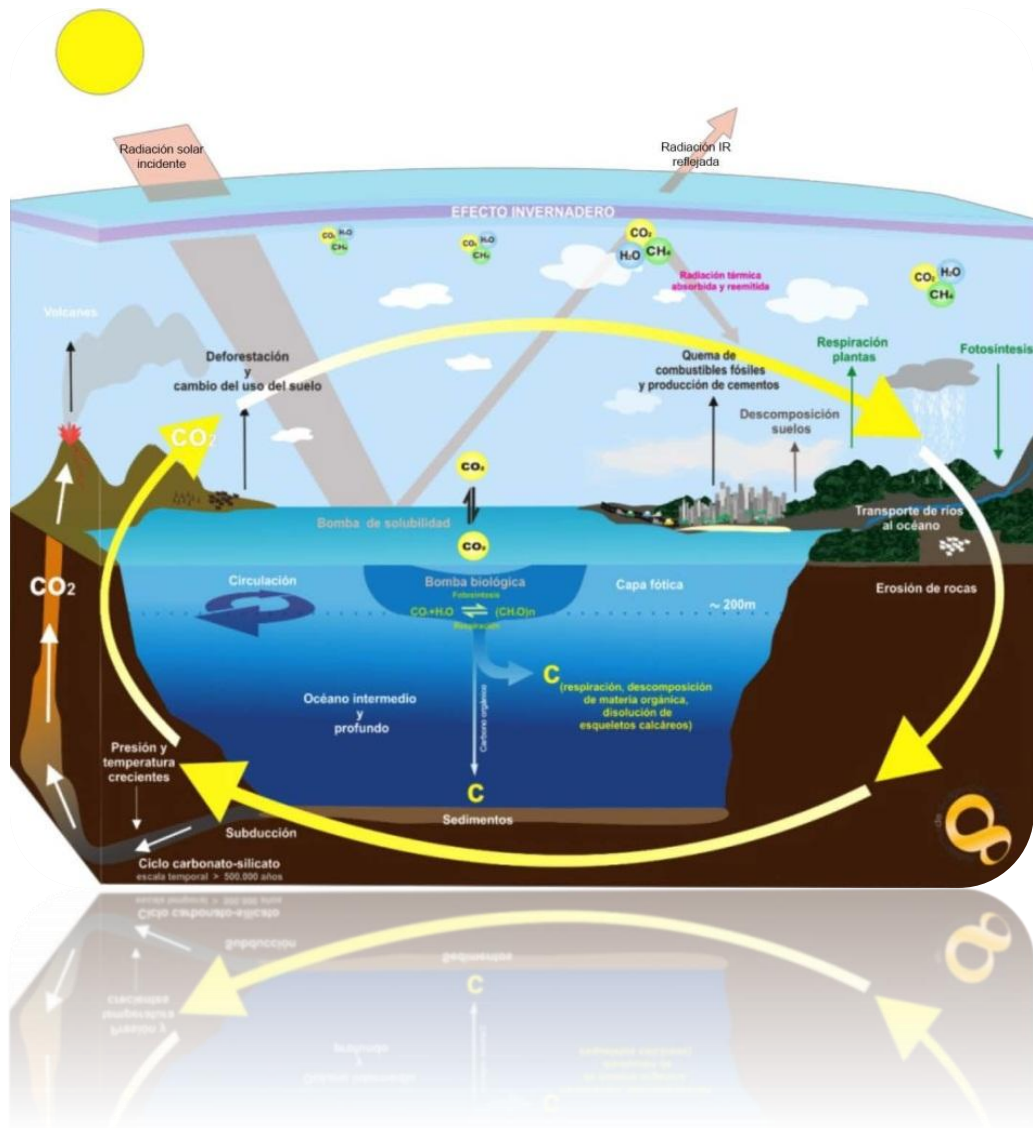


Figure 1. Biogeochemical carbon cycle and changes due to human activities.
http://earthobservatory.nasa.gov/Library/CarbonCycle/carbon_cycle4.html

It is known that one of the major causes of climate change (CC) is the increase in greenhouse gases, such as carbon dioxide (CO₂), methane (CH₄) and nitrogen oxide (N₂O). CC is a problem with unique characteristics due to its global character; its long-term impact can be observed and it involves complex interactions not only between natural processes (ecological and climate phenomenon) but also between social, economic and political processes (IPCC, 2001).

The climate regulates all natural processes that social and economic development depend on.

Agriculture, in many regions, not only depends on the temporality and abundance of rain, but also the change of air temperature. Fishing varies depending on the species being captured, because fish depend on marine currents and their characteristics, like temperature and salinity, which are controlled by the temperature and fresh water brought from the continent after it rains. Even tourism depends on climate. In the summer, the sun and the correct temperature are required for the beaches. In the winter, snow is required for skiing. Thus governments develop policies that favor activities that generate economic resources and wellbeing. However, for a

long time, those policies have not considered that human activities have had negative repercussions in the biogeochemical carbon cycle and that they also have negative effects on the climate and on the functioning of ecosystems (Canadell *et al.*, 2007; Robbins *et al.*, 2009).

This is a fragment of the interesting scientific article that Jorge Alfredo Herrera sent us and if you are interested in reading the full article you can find it on our website: www.creho.org in the publications section.

Course:

Wetland Management Plans with Climate Change Focus



The Ramsar Western Hemisphere Teaching Center (CREHO), in partnership with Wetlands International Foundation (FWI), delivered a course on Wetland Management Plans with focus on Climate Change in September and October 2016. In addition to the staff of MiAmbiente and ARAP, technicians and wetland specialists from several Latin American and Caribbean countries (LACs) also participated, including the Focal Point of the Ramsar Convention of El Salvador.

The Wetlands International Foundation (FWI), in partnership with CREHO, in the framework of the IKI-UNDP Project, has also been developing a series of training courses on Adaptation Mitigation and Climate Change for technicians from the Ministry of Environment Of Panama (MiAmbiente) and from the Aquatic Resources Authority of Panama (ARAP).



SUMMARY

The course approach of Wetland Management Plans with a focus on Climate Change, revolved on two axes:

- (1) To guide the elaboration of Management Plans for continental and coastal wetlands and
- (2) To guide the cross-cutting integration of climate change into such plans.

For the development of these two axes, four webinar-type web-based conferences were conducted - through the UNEP REGATTA Platform called "Community of Practice on Ecosystem-Based Adaptation (AbE)" / Module 16-.

In addition, a series of face-to-face sessions were held that took place during five days in the archipelago of Bocas del Toro in Panama. The sessions this week consisted in presentations by facilitators of the course and a series of guests; exchanges of experiences between participants; and tours to nearby protected wetlands and their area of influence / damping in order to make observations and exercises in the field.

As a way of closing the course, the students presented a final paper in which they made a proposal to move forward with the update of the San San Pon Sak Wetland Ramsar Site of International Importance (HSSPS). In this proposal, students were able to describe the steps to be taken (i), update the Management Plan by filling in gaps in key information (ii), Integrate the variables related to climate change into the management plan (iii), and (iv) Prepare it for its periodic updating based on an effective mechanism of monitoring, learning, and feedback at multiple scales of work with several actors. These proposals were sent to the Directorate of Protected Areas of MiAmbiente for consideration as technical recommendations.
AbE Community: www.comunidadabe.pnuma



The course "Management Plans for Wetlands with a Climate Change Approach", had two modalities, virtual and face-to-face.

The virtual phase of the course was 4 weeks long and was held during September 2016.

The method of verification of the progress made by the students in their knowledge consisted in the following components that were evaluated:

- Participation with questions and comments during webinars.
- Reading controls.
- Participation in forums of Virtual Platform of Community of Practice in AbE.
- Use of concepts and tools during exercises.
- Final work in face-to-face phase.

During the face-to-face phase that took place during the first week of October 2016 in Isla Colón - Bocas del Toro archipelago, Panama – topics were deepened through keynote presentations,



field trips, exercises and the development of a final work in groups. This final work was aimed at making recommendations to strengthen the HISSPS Management Plan.



CREATIO