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Sixth Meeting of the Scientific and Technical
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Region

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OVERVIEW OF THE RESEARCH NETWORK OF MARINE-COASTAL STRESSORS IN LATIN AMERICA AND THE CARIBBEAN (REMARCO)

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

REMARCO – NETWORK FOR RESEARCH ON MARINE – COASTAL STRESSORS IN LATIN AMERICA AND THE CARIBBEAN

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The Marine-Coastal Stressors Research Network in Latin America and the Caribbean – REMARCO, is a non-profit voluntary network of cooperation in science and communication that was consolidated in October 2019, which connects 18 countries in Latin America and the Caribbean, where collaborators use nuclear and isotopic techniques to address environmental problems of marine-coastal ecosystems in the region. The countries that are part of REMARCO are Argentina, Belize, Brazil, Chile, Colombia, Costa Rica, Cuba, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Peru, Dominican Republic, Uruguay and Venezuela (Figure 1).



Figure 1. Countries that are members of REMARCO

REMARCO is the result of cooperation between Latin American and Caribbean countries that have participated in technical cooperation projects of the International Atomic Energy Agency - IAEA (Figure 2), initiated by the RLA7012 project "Application of nuclear techniques in the solution of specific problems of integrated management of coastal areas of the Wider Caribbean" that was carried out between 2007 and 2012, with the objective of developing and improving the capabilities of the Wider Caribbean region to

reduce the degradation of coastal ecosystems, due to anthropogenic and natural impacts, through the use of nuclear techniques to support integrated coastal zone management. This project generated the capacity of 12 countries to sample sediment cores, date them with the ^{210}Pb technique and thus reconstruct the contamination by metals and organic compounds in bays of the Greater Caribbean of interest to the participating countries. In addition, in order to standardize methodologies that lead to comparable data, the project generated two technical documents: Radiochronology of coastal sediments using ^{210}Pb : models, validation and applications and the guide for the use of sediments in the historical reconstruction of contamination in coastal areas.

Next, the RLA7014 project "Design and implementation of early warning systems and toxicity assessment of harmful algal blooms (HABs) in the Caribbean region", carried out between 2009 and 2014, with the objective of contributing to the reduction of risks to public health and to the local economy caused by harmful algal blooms (HABs) in the Latin American and Caribbean region, increasing the capacity to assess algal toxins in seafood. This project strengthened the capacities of 12 countries in the region to sample and identify potentially toxic phytoplankton species; and detect and identify toxins produced by phytoplankton species using the nuclear RBA technique; and generated the technical document "Guidelines for the design and implementation of a monitoring plan for toxin-producing microalgae.

Project RLA7020 "Establishment of the Caribbean Observation Network for Ocean Acidification and its Impact on Harmful Algal Blooms, using Nuclear and Isotopic Techniques" was carried out between 2014 and 2018 with the objective of adopting and implementing climate change mitigation and adaptation programs in the member states of the Greater Caribbean. This project began to strengthen the capacities of 11 countries in the region to measure ocean acidification and evaluate historical trends in the region.

Given the amount of data generated with these three projects and the need to generate effective communication strategies for decision makers, project RLA7022 "Strengthening the Monitoring and Response Network for the sustainability of marine and coastal environments" was designed. This project was carried out between 2017 and 2019, with the objective of Contributing to the construction of an effective environmental policy for the sustainable management of marine resources. With this project, the REMARCO Network was established, bringing together more than 100 researchers from 14 countries; the research line on microplastics was included; and the communication strategy was initiated in order to raise awareness among decision-makers about the threats affecting their marine environment, for which scientific data are presented in understandable language; the existence of the regional collaborative network is communicated; and scientifically based evidence is provided to provoke action and underline the importance of establishing long-term marine programs. Communication strategies are available at www.remarco.org.

Currently, the RLA7025 project "Strengthening capacities in marine and coastal environments through nuclear and isotopic techniques" is being implemented, which began in 2020 and runs until -2024, with the objective of contributing to the fulfillment of the Sustainable Development Goals (SDGs), in particular SDG14, through the use of nuclear and isotopic techniques. This project has allowed the consolidation of the Network, and the beginning of the strengthening to define the eutrophication indicator. Currently, REMARCO is composed of scientists and communicators belonging to institutions from 18 countries that aim to facilitate decision making in the face of common challenges and vulnerabilities present in marine-coastal environments, and to contribute to the definition of public policies towards the comprehensive solution of these problems.

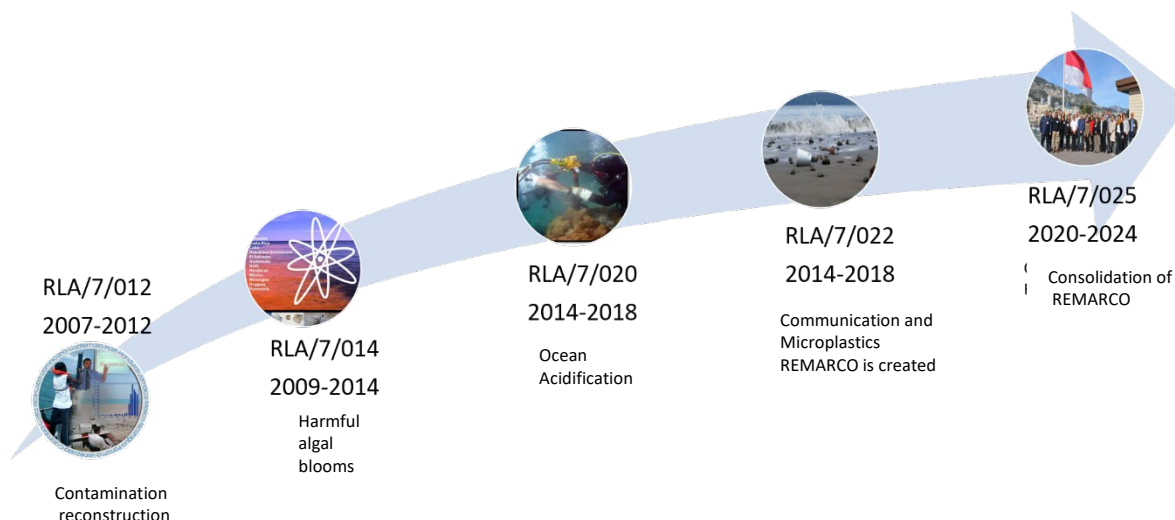


Figure 2. Initiation and consolidation of the REMARCO Network

Considering the strengthening of the countries participating in the network, REMARCO's areas of work are chemical pollution, including microplastics, ocean acidification, harmful algal blooms and eutrophication. The network has a communication strategy that is permanently updating the activities carried out, and scientific publications have been made with the information generated in the network.

The first guide for sampling microplastics on sandy beaches was compiled and samples have been taken from 122 beaches in the 18 countries of Latin America and the Caribbean in order to characterize the abundance of microplastics. Some of the samples were analyzed at the Laboratory of Radioecology and Environmental Changes (LARA) of the Federal University of Fluminense, Brazil, to determine their chemical nature.

Currently, most of the countries have developed pilot programs for monitoring HABs in sampling sites off their coasts; there is a regional guide to standardize methodologies; and there are three regional centers for saxitoxin analysis using RBA: Colombia, Cuba and El Salvador.

In the area of ocean acidification, 5 protocols for the collection and determination of carbonate system variables have been developed and disseminated in Spanish <https://remarco.org/manual-ao/>; 6 video tutorials have been developed with detailed step-by-step instructions for the collection and determination of carbonate system variables in Spanish and translated into English <https://www.youtube.com/@remarcolac9076/videos>; a kit was designed for sample collection and measurement of two carbonate system variables that allow obtaining results with "Weather" quality required for indicator reporting, which have been donated by the regional project RLA7025; INVEMAR, has the capabilities for purification of purple m-cresol (reagent required for pH measurement by spectrophotometry) for the region; 3 countries (Colombia, Cuba and Mexico) are reporting indicator 14.3.1 of SDG 14 to the platform of the Intergovernmental Oceanographic Commission (IOC) of UNESCO <https://oa.iode.org/>; there is a consolidated cooperation network that meets constantly to resolve doubts and work for the region.

REMARCO intends those other countries in the region, especially English-speaking countries, become involved in order to establish a regional monitoring system that uses standardized methodologies to follow up on the stressors affecting the region's seas and coasts.