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COMMISSION**
(of UNESCO)

**Sixteenth Session of the UNESCO IOC Sub-
Commission for the Caribbean and Adjacent
Regions (IOCARIBE) Assembly**
(Virtual Meeting, May 3-6, 2021)

**IOC/IOCARIBE HAB-ANCA
PROGRESS REPORT
2019 – 2021**

**Jose Ernesto Mancera Pineda
ANCA Chair**

*Agenda Item 6. Review and Reporting of Regional Programmes, Projects and Working Groups,
April 2019 – April 2021*

During the intersessional period 2019-2021 the IOCARIBE-ANCA working group accomplished the goals proposed in November 2018 at the IOCARIBE-ANCA VII workshop in Panama and presented in Aruba in 2019 in IOCARIBE XV.

I- IOCARIBE-ANCA contribution to HAB global report

The summary report on harmful algae blooms in Latin America and The Caribbean was accepted for publication in Harmful Algae journal under the title: "The Latin America and Caribbean HAB status report based on OBIS and HAEDAT maps and databases" (Annex 1). In this paper it is shown that Harmful Algae Blooms (HAB) have been documented for at least fifty years in Latin America and the Caribbean (LAC), however, their impacts at social, ecological and economic levels are still little known. To contribute to the impact assessment of HABs in LAC region, the available information in HAEDAT, OBIS, CAREC, and CARPHA databases, and scientific literature was analyzed. This historical analysis allows identification of the main syndromes and causal organisms. In the IOCARIBE region, HAEDAT listed 131 records from 1956 to 2018. The main problems are PSP and Ciguatera and common HAB taxa are Gambierdiscus, Gymnodinium, Pyrodinium, Alexandrium and Dinophysis. Trends analyzed up to 2019 are related to the increasing

awareness about presence of toxic species, the geographical expansion of already known species, the detection of new toxins for the region, and HAB events duration and/or impacts.

II. VIII HAB-IOCARIBE-ANCA meeting

The VIII ANCA meeting was held in order to know the specific progress of each country and agree on future actions. To have an overview of the IOCARIBE-ANCA region progress, we focus on two questions: How is each country organized in legislation, research and management to deal with HAB events? And what experience and capabilities does each country have?

The meeting was held online from March 3-5, with the participation of experts from different countries: Colombia, Costa Rica, Cuba, El Salvador, Guatemala, Honduras, Jamaica, Mexico, Panama, and Venezuela. The event was broadcast on social networks and was attended by 82 people from 16 countries in America, Europe and Asia.

(https://unesco-org.zoom.us/webinar/register/WN_Ourz98shSdqNp993LnuMEQ)

Considering that the Caribbean region is made up of 43 territories, the great challenge is to have a better representation of countries in the IOCARIBE-ANCA group. Therefore, this panorama corresponds mainly to continental countries.

The event was opened by Elisa Berdalet who presented the GlobalHAB program and possible mechanisms for the articulation of HAB-IOCARIBE-ANCA in this initiative. Cesar Toro, Executive Secretary of IOCARIBE, spoke about the United Nations Decade of Ocean Sciences for Sustainable Development (2021-2030). Ernesto Mancera presented the contribution of ANCA-IOCARIBE in the HAB status report for Latin America and the Caribbean based on OBIS and HAEDAT.

During the VIII HAB-ANCA-IOCARIBE, Carlos Seixas and Adriana Santos-Martínez, paid a posthumous tribute to María Esther Meave and Luis Alfonso Vidal, who through their dedicated work contributed significantly to the knowledge of phytoplankton and the training of human resources.

On the second day of the meeting, Henrik Enevoldsen showed the novelties of the IOC HAIS/HEADAT tool, widely used for the documentation of HAB events around the world.

Each country presented a complete report on the HAB events in recent years, as well as the actions, achievements and results regarding this problem. In some of the Caribbean countries there are specific government entities to deal with HAB matters, but in few there are national HAB monitoring programs. Universities and research institutions are important allies, but it is necessary to improve cooperation mechanisms between government entities and those allies. Country delegates recognized the importance of including HAB events in HAEDAT but expressed the difficulty of doing so in many cases. There is an important group of experts in the region but it is necessary to strengthen capacity

development, mainly on issues such as cyanotoxins and HABs related to the arrival of sargassum. Although local institutions and international cooperation projects provide financial support in some cases, in general the delegates consider it urgent to finalize a regional proposal to integrate HAB research in the Caribbean region.

In Cuba there is one of the two regional reference centers for the analysis of paralyzing toxins in the Caribbean (CEAC - Center for Environmental Studies of Cienfuegos). In 2009 CEAC began the execution of a regional research program with the support of the IAEA, aimed at assessing marine toxins in the Caribbean countries and developing Early Warning Systems for HAB.

In El Salvador there is the other regional reference center for paralyzing toxins analysis. Since 2012 the Reference Center has developed three regional projects with IAEA funding. El Salvador has installed capacity to the Receptor Binding Assay (RBA) for Ciguatoxins and Saxotoxins determination; Determination of: PSP, DSP, ASP.

In Costa Rica there is a Red Tide Epidemiological Surveillance Commission. The National Animal Health Service established a "red tide" surveillance program, which should monitor those species of mollusks or other aquatic organisms that accumulate phycotoxins (PSP). Costa Rica has installed capacity for toxin analysis.

The HAB group of Colombia is part of the National Technical Committee for the Prevention of Marine Pollution of the Colombian Oceanographic Commission. Several institutions belong to the HAB group, such as the National University of Colombia, INVEMAR, the National Institute of Health, DIMAR and CIOH. So far, the HAB group has held four national meetings, the last one in 2020 focused on the design of an Early Warning System within the framework of risk management. The country has installed capacity for the detection of marine toxins (RBA, UPLC-Ms) as well as training of personnel.

In Venezuela there are national and regional HAB Committees. They carried out a project with the support of the IAEA and developed regulations for the extraction of bivalve molluscs and defined the permissible concentrations of some marine biotoxins.

In Honduras there is no National HAB Committee, nor are there monitoring programs in marine environments, however, they report problems with freshwater cyanobacteria.

Panama created in 2018 the HAB Commission as well as a chapter of ANCA-Panama. Both research and monitoring are carried out in the country on both the Caribbean and Pacific coasts.

Guatemala has a National Commission of the Toxic Red Tide and reports monitoring of water samples and toxicity in bivalve molluscs.

Mexico presents a good example for the development of national HAB knowledge and management plans in the IOCARIBE region. In 2010- they created the Mexican Society for the Study of HAB (SOMEFAN). <http://somefan.org/> and in 2014 the Mexican Network of HAB <https://redfan.cicese.mx/>. The main objective is to strengthen FAN research in Mexico to consolidate collaborations between academia, actors and policy makers through a National Plan that will establish priorities for attention to the HAB problem.

On the third day, the participation of the HAB-IOCARIBE-ANCA group was discussed in the XIX International Congress on Harmful Algae - ICHA to be held in October/2021 and organized by Mexico (Dr. Christine Band Smith). On the other hand, Erick Nuñez provided a complete report on Mexico's progress in ciguatera.

During the development of the workshop, commitments were also generated such as: management for the HAIS / HEADAT Webinar; IOCARIBE-ANCA participation in ICHA; Design of a virtual HAB course; elaboration of a macro-regional project and design of a web page. Finally, Gustavo Arencibia Carballo, representative of Cuba, was elected as president of IOCARIBE-ANCA.

III. Future work-plan 2021-2023

To achieve greater visibility, it was agreed to participate in XIX ICHA 2021 as regional working group. The proposed topics are: occurrence of events associated with ciguatoxin and PSP; sargassum and other macroalgae massive arrivals; effects of climate change on the occurrence of HAB events in the region; training and education needs of young scientists; national strategies and protocols for strengthening the HAEDAT database; Early Warning Systems; ANCA collaborative strategy in achieving the ocean decade goals.

It was agreed to improve regional capacities by continuing collaborative work with groups funded in the region by the IAEA.

To strengthen the HAEDAT database with the Caribbean records, it was proposed to the IPHAB executive secretary to develop training in the new version of the HAIS / HAEDAT database.

On the other hand, to strengthen the links between academia, policy makers and other stakeholders, it was proposed to develop a HAB-Caribbean course using virtual reality techniques.

Finally it was agreed to present a regional project to improve knowledge on cyanobacteria, cyanotoxins and ciguatera.

From March 23 to 25, we participated in the IPHAB XV, presenting the progress report. The Fifteenth Session of the Intergovernmental Panel on Harmful Algal Blooms (IPHAB-XV) was held on-line. The Panel reviewed the actions completed during the intersessional period, noted the progress made and that several of the UN Ocean Decade challenges are being addressed. The Panel concluded that the Decisions and Recommendations of the Fourteenth session (April 2019) had been implemented highly satisfactory within the available resources. The major achievements reported, some still in progress, include among others, the growing development of the regional activities in the Caribbean, IOC/IOCARIBE/ANCA.