

Harmful Algae News

AN IOC NEWSLETTER ON TOXIC ALGAE AND ALGAL BLOOMS

No. 66 - December 2020 · www.ioc-unesco.org/hab



United Nations
Educational, Scientific and
Cultural Organization



Intergovernmental
Oceanographic
Commission

The Recurring Great Atlantic Sargassum Belt Impacts the Caribbean and South Florida

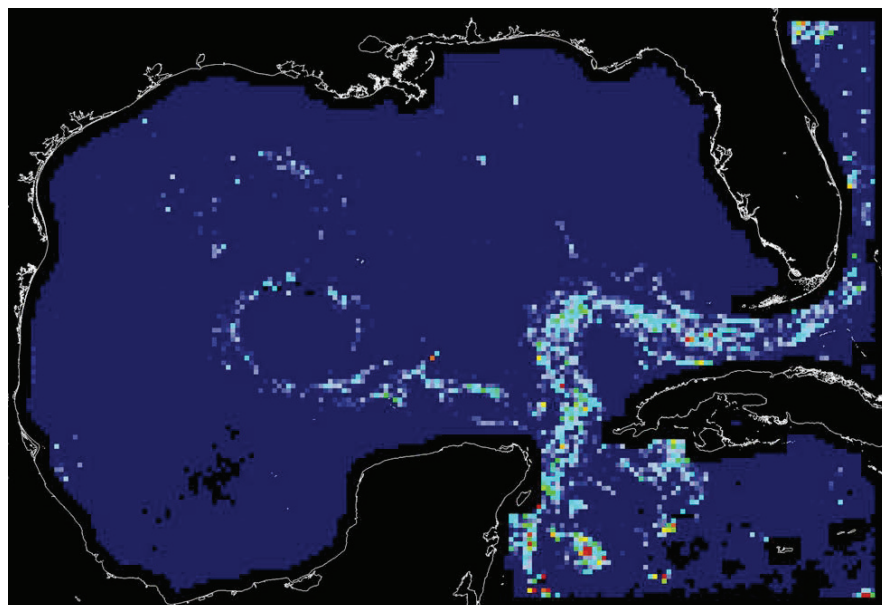


Fig. 1. MODIS satellite image of Sargassum transport from the Caribbean through the Yucatan Channel and into the Loop Current and Florida Current on July 16, 2020

Since 2011, the floating brown seaweeds known as pelagic *Sargassum* have formed a *Great Atlantic Sargassum Belt* (GASB) in the tropical Atlantic Ocean extending between Africa and South America [1]. The GASB represents an expansion in the distribution of this unique floating vegetation, which was historically restricted to the Gulf of Mexico (GOM), Loop Current, Gulf Stream, Sargasso Sea, and Caribbean Sea (Fig. 1). This vegetation was first reported by Christopher Columbus in the Sargasso Sea in 1492 and includes two pelagic species – *Sargassum natans* and *Sargassum fluitans* – that reproduce by vegetative fragmentation (Fig. 2). Early oceanographers were impressed with the vigorous appearance of *Sargassum* in the Sargasso Sea and estimated that ~90% of this vegetation was comprised of *S. natans* with the remainder being *S. fluitans* and several benthic species recruited from shallow coastal waters of the West Indies [2].

The precept that pelagic *Sargassum* flourishes in surface waters of the

Sargasso Sea became a paradox to modern oceanographers who referred to this oligotrophic gyre as a “biological desert” [3]. Studies of the productivity and nutrition of *Sargassum* showed that photosynthesis and growth of these oceanic populations were nutrient-limited in the Sargasso Sea, compared to more productive nutrient-enriched plants in neritic waters of the GOM, Loop Current, and Gulf Stream [4]. These studies documented the importance of nutrient cycling by associated fish and invertebrates within the pelagic *Sargassum* community that has been designated “Essential Fish Habitat” by the National Oceanic and Atmospheric Administration (NOAA). A variety of nutrient sources in neritic waters of the western North Atlantic Ocean and GOM explained the higher nutrient contents and productivity of *Sargassum*, which included shelf-break upwelling, continental runoff via rivers (Mississippi River, Everglades), submarine groundwater discharge, benthic sediment recycling,

Content

Featured article:

The Recurring Great Atlantic *Sargassum* Belt (by Brian Lapointe) 1

Benthic HABs

Ciguatera event from imported reef fish in New Zealand 4
1st report of *Ostreopsis* in a tropical lagoon in the Gulf of Guinea 6

Other HAB impacts

Monetary impact of toxic *Dinophysis* spp. on Scottish shellfish farms 8
Bloom of *Cylindrotheca closterium* in SE Gulf of Mexico 10

Networking and Science

Communication

New GlobalHAB Theme: *Sargassum* Blooms 11
1st US HAB Science Communication Workshop 12
Colombia and the Ciguatera problem 14

Obituaries

Luis Alfonso Vidal 15
Masaaki Kodama memories 16

Hybrid 19th ICHA 2021

Call for abstracts 19



Bloom of *Cylindrotheca closterium* originating from shrimp farming discharges in the SE Gulf of Mexico

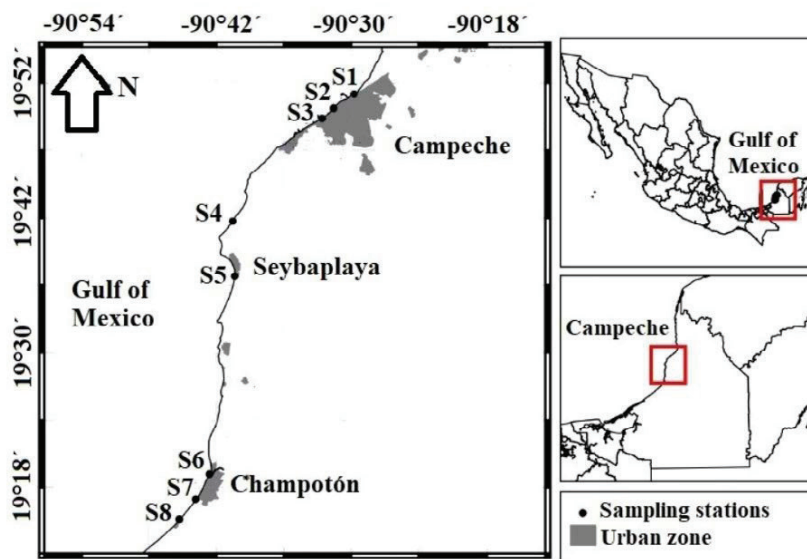


Fig. 1. Location of sampling sites (S1-S8) in coastal waters of Campeche (red frame), Peninsula de Yucatán, SE Gulf of Mexico.

Discharges from shrimp farming into the sea are common in the coastal zone of Campeche, located on the western side of the Yucatán Peninsula, SE Gulf of Mexico (Fig. 1). These discharges, with heavy loads of nutrients added to stimulate phytoplankton production, are a major source of eutrophication [1]. Despite the environmental impact of these activities in shrimp cultivation areas in the Caribbean, very little information is available on the

phytoplankton species composition within the discharge waters. A project was carried out to identify anthropogenic impacts along the central coast of Campeche. The project included a study of phytoplankton species composition, with an emphasis on potentially harmful species. Eight sampling stations (depths ca. 50 cm) from three coastal localities (City of Campeche, Seybaplaya and Champotón) corresponding to sites affected by anthropogenic inputs were chosen (Fig. 1). These stations were sampled in September and November 2016. A bloom of the pennate diatom *Cylindrotheca closterium* (Ehrenb.) Reimann & J.C. Lewin, with a maximum of 1.4×10^5 cells L^{-1} , was observed in September. The maximum cell density was found at station S4, a drainage area for shrimp farming discharges (Fig. 1). Environmental conditions in this station at the time of sample collection were: salinity 41.5, temperature 31.5°C, pH=9.2 and dissolved oxygen 7.1 mg L^{-1} . Water discoloration was observed (Fig. 2).

Cylindrotheca closterium, a well known bloom-forming species, has been reported in high cell densities in the SE Gulf of Mexico [2]. In coastal

waters of northern Yucatan, the species is present in high numbers throughout the year. Blooms have been observed mainly during the warmer rainy season from mid-May to mid-October [3]. Our observations are in agreement with these results. In Yucatan waters, especially in the marinas, *C. closterium* blooms appear to be linked to high concentrations of nitrite, phosphate, nitrate and urea. These phytoplankton blooms are indicators of eutrophication due to fluctuations in environmental conditions because of the intensity and type of human activities occurring in the study area. The species is ubiquitous, has a high potential to dominate both planktonic and benthic microalgal assemblages, and is characterized by its high growth, reproduction rates and its wide geographical distribution.

Acknowledgements

The financial support to project "Fitoplancton marino potencialmente nocivo de la costa central de Campeche, México", 022.16-P04 (2016-2017) from COSDAC-SEMS-SEP (Coordinación Sectorial de Desarrollo Académico de la Subsecretaría de Educación Media Superior de la Secretaría de Educación Pública, México) is acknowledged.

References

1. Alonso-Rodríguez R et al 2004. *El fitoplancton en la camaronicultura y larvicultura: importancia de un buen manejo*. ICMYL-UNAM y Comité Estatal de Sanidad Acuicola de Sinaloa, México. 147 pp
2. Merino-Virgilio F et al 2019. In: Kovács A & P Nagy (eds) *Advances in Marine Biology*, vol 4. Nova Science Publishers, Inc, Hauppauge, NY, USA, pp 52-72
3. Poot-Delgado CA 2016. *Investigación y Ciencia de la Universidad Autónoma de Aguascalientes* 67: 91-96

Authors

Carlos A Poot-Delgado, Tecnológico Nacional de México / Instituto Tecnológico Superior de Champotón, CP 24400, Champotón, Campeche, México
Yuri B Okolodkov, Instituto de Ciencias Marinas y Pesquerías, Universidad Veracruzana, CP 94290, Boca del Río, Veracruz, México

Email corresponding author:
cpoot35@gmail.com

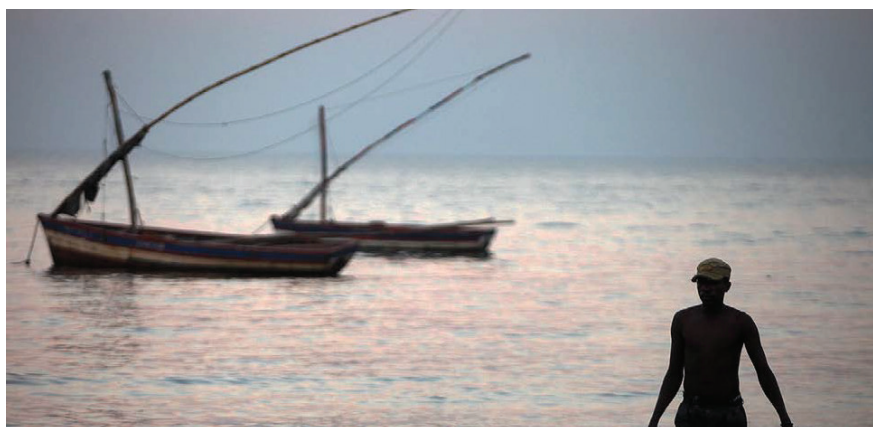


Fig. 2. Water discoloration from a bloom of *Cylindrotheca closterium* observed in September 2016 in shrimp farming discharge waters in Campeche, SE Gulf of Mexico.

Monitoring and preventing ciguatera poisoning

FAO-IAEA-IOC-WHO e-learning course

Ciguatera poisoning is one of the most common foodborne illnesses related to consumption of fishery products, caused by ingesting seafood that have been contaminated by ciguatoxins (CTXs). This course is designed to help learners understand the ecology of the causative organisms, as well as the potential hazard of fish contamination and consequent illnesses. The course proposes tools, approaches and strategies for the design and implementation of environmental, food safety and epidemiological monitoring, with a view to developing a well-informed ciguatera risk management plan.



The Course is now available online, as a global public good, through the FAO e-learning Academy: elearning.fao.org. Direct link to the course: <https://elearning.fao.org/course/view.php?id=648>

The FAO e-learning Academy is adopting the *Digital Badges Certification System*, to certify the acquisition of competencies, progress talents within organizations and increase employment opportunity.

Eds-in-chief

Beatriz Reguera, IEO, Vigo, Spain
Eileen Bresnan, Marine Scotland, UK

Regional Editors

- Caribbean: Ernesto Mancera
jemancerap@unal.edu.co
- Atlantic Europe: Maud Lemoine
Maud.Lemoine@ifremer.fr
- Mediterranean Sea: Adriana Zingone
zingone@szn.it
- India: K.B. Padmakumar
kbpadmakumar@gmail.com
- Western Pacific: Chu Pin Leaw
cpleaw@um.edu.my
- North Africa: Hamid Taleb
htaleb@hotmail.com
- North America: Patricia Tester
patricia.test@noaa.gov
and Jennifer Martin
Jennifer.Martin@dfo-mpo.gc.ca
- South America: Patricio Díaz
patricio.diaz@ulagos.cl
and Luis Proenca
luis.proenca@ifsc.edu.br
- South Pacific: Mireille Chinain mchinain@ilm.pf
and Lesley Rhodes Lesley.Rhodes@cawthron.org.nz

Please feel free to contact any of the editors if you have article, ideas for article or special issues and we will work with you!

Deadline

Deadline to submit material for HAN 67:
March 15th, 2021

Compiled and edited by

Beatriz Reguera, Instituto Español de Oceanografía (IEO), Subida a Radio Faro 50, 36390 Vigo, Spain
Tel: +34 986 492111
Fax: +34 986 498626
Email: beatriz.reguera@ieo.es
and
Eileen Bresnan, Marine Scotland, Victoria Road, Aberdeen AB1 9DB, Scotland
Tel.: +44 122 4876544
Fax: +44 1224295511
Email: eileen.bresnan@gov.scot

The opinions expressed herein are those of the authors indicated and do not necessarily reflect the views of UNESCO or its IOC. Texts may be freely reproduced and translated (except when reproduction or translation rights are indicated as reserved), provided that mention is made of the author and source and a copy sent to the Editors.

Project Coordinator

Henrik Enevoldsen, IOC Science and Communication Centre on Harmful Algae, University of Copenhagen, Universitetsparken 4, 2100 Copenhagen Ø, Denmark
Tel.: +45 23 26 02 46
E-mail: h.enevoldsen@unesco.org

Lay-out

Department of Biology, University of Copenhagen, Denmark

**The publication of Harmful Algae News
is sponsored by the Department of Biology,
University of Copenhagen**