

XVII Session of the IOC-FAO
Intergovernmental Panel on Harmful
Algal Blooms

Paris, 18–20 March 2025

REPORT OF THE IPHAB
TASK TEAM ON HAB
COMMUNICATION

Beatriz Reguera & Kenneth Mertens



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HARMFUL ALGAE NEWS

An IOC Newsletter on toxic algae and algal blooms

Introducing ...

This Newsletter on harmful algae responds to the expressed wishes of participants in several IOC workshops on harmful algal blooms, in particular the IOC-SCOR Workshop in Newport, Rhode Island (USA), 2-3 November 1991. Its purpose is to disseminate information on harmful algal events and on research results as well as to announce research and management programmes, conferences, meetings etc.

Harmful Algae News is initially published in conjunction with UNESCO's quarterly *IMS Newsletter*. Tim Wyatt has, at IOC's request, agreed to be the initial Editor. Ideas, manuscripts or information appropriate to include in coming issues, should be addressed to him or Yolanda Pazos, Instituto de Investigaciones Marinas, Eduardo Cabelo 6, 36208 Vigo, Pontevedra, Spain; tel: (34-86) 23 19 30; fax: (34-86) 29 27 62.

Distribution: Although initially to be mailed together with *IMS Newsletter*, it is envisaged that *Harmful Algae News* will eventually be distributed separately. Participants at the 5th International Conference on Toxic Marine Phytoplankton will automatically be on the address list; others wishing to be included should write to: *Harmful Algae News*, IOC of UNESCO, att.: Henrik Enevoldsen, 1 rue Miollis, 75015 Paris, France.



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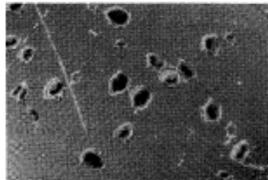
Harmful algal blooms

by Tim Wyatt and Yolanda Pazos

For about a century, studies of phytoplankton and algal blooms have been regarded as fundamental components of fisheries research, since in the last analysis the yields of fisheries must depend on them. The notion that algal blooms can be harmful therefore requires some explanation. The word 'bloom' in the present context refers to discoloration of the water caused by plankton growth, and was used in this sense at least as early as 1838⁽¹⁾. These

of 1898 have only been noted once in the entire recorded history of Narragansett Bay'. The *Chrysochromoida polylopha* bloom which took place in the Skagerrak in 1988 provides a recent example.

Harm is inflicted by these events in a variety of ways. Growth and accumulation, followed by cessation of photosynthesis and subsequent decay of the accumulated plankton can cause deoxygenation of the water, leading to



Left: The potentially toxic diatome Dityrosira roevegica (48.67 µm long) is a common species in northern European waters. The toxicity is due to okadaic acid and related substances responsible for diarrhetic shellfish poisoning. Photo: Per Andersen, Bioticonal.

Right: Noctiluca scintillans, a non-photosynthetic dinoflagellate very common world-wide. This species is non-toxic and harmless in low concentrations, but often develops mass occurrences which are subsequently associated with anoxia and mortalities of marine fauna. Photo: Courtesy of Instituto Español de Oceanografía, Vigo, Spain.



Blooms are fairly predictable annual events, both in the sea and freshwater, and sampling reveals that diverse mixtures of species are involved. The sometimes harmful algal blooms (HABs) of concern here are, in contrast, not at present predictable, are usually dominated by a single species, and frequently colour the water red or brown rather than green or olive, hence the term 'red tide'. Just how unpredictable these events can be was dramatized for example by Scott Nixon⁽²⁾ in his search for the causes of a harmful bloom which occurred nearly a century ago. He wrote: '... it must be remembered that the events of the late summer

death of fish and invertebrates. Even normally innocuous species can cause harm in this way. Some species when abundant secrete polymers into their surroundings which can render the water so viscous that fish have difficulty in pumping it through their gills. Others, like the diatom *Chaetoceros concavicornis*, are spiny, and can irritate fish gills, leading to mucus production, gill damage, and reduced gaseous exchange. Blooms of these kinds are causing serious losses every year to fish farmers in several countries, and put a serious brake on future investments in this industry.

(Cont'd on p. 5)

Harmful Algae News

1992 - 2025



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- HAN is the official bulletin of the IOC for dissemination of all HAB programme related activities: GlobalHAB, IOC Regional Groups, and others
- It serves as newsletter to the International Society for the Study of Harmful Algae (ISSHA)
- In addition to feature articles and new observations reported by HAB experts worldwide

HAN BEGAN PUBLICATION AT THE SAME TIME AS THE ESTABLISHMENT OF THE HAB PROGRAMME AND THE IPHAB

IOC HAB Activities

- 7 Task Teams
- 5 Regional Groups
- 2 ICES-IOC Working Groups
- 1 International IOC-SCOR Programme

With very uneven dissemination of their activities through HAN !

Speedy modern digital media challenge successful continuity of HAN without innovation

2023

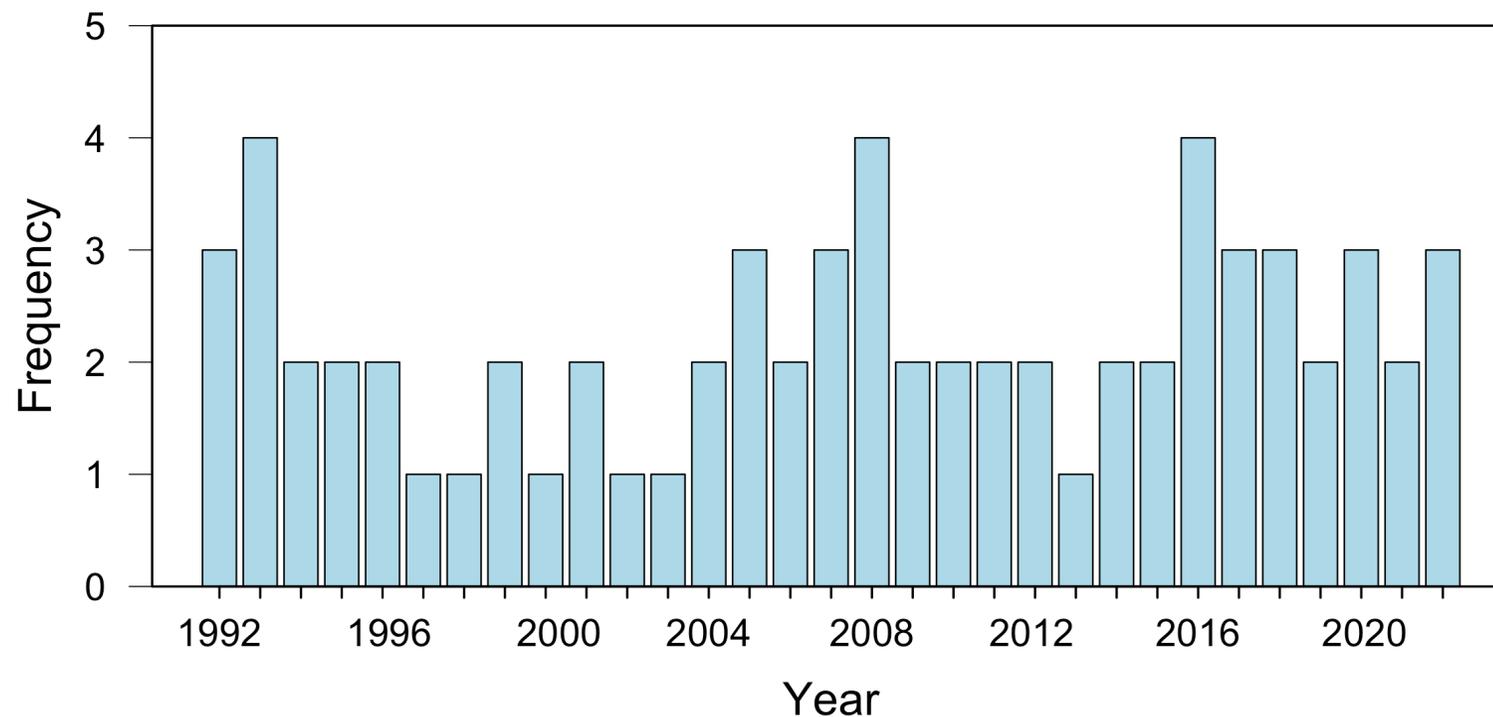




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HAN Issues per year



**A community of ca.
2500 people receives
e-HAN**

**The objective of
producing 4 issues per
year was not achieved**

hab.ioc@unesco.org



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HARMFUL ALGAE NEWS – An IOC Newsletter on Harmful Algal Blooms and their Socio-Economic Impacts [Subscribe](#)

Harmful Algae News (HAN) is an IOC Newsletter created in 1992 to disseminate information on toxic/harmful algal blooms (HAB) and their socio-economic impacts as well as research news and management activities of interest to researchers, managers, policy makers and the general public. The Newsletter also serves as newsletter for [GlobalHAB](#) and the [International Society for the Study of Harmful Algae \(ISSHA\)](#). Contributions to HAN include short feature articles, reports of new harmful events, highlights of international, regional and national HAB conferences, working groups, and HAB training and networking activities.

Harmful Algae News only exists if the Editor gets input from YOU!

Write to Editor NOW with news on new HAB events and their impacts in your country or region, or any other news and announcements you wish to share worldwide with a HAB community of ca. 5500 scientists and managers subscribed to the digital 'Harmful Algae News'. **Please submit manuscripts by e-mail to the Editors. [Guide for authors here!](#)**

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Links to download PDF of each issue from # 55 (Year 2016) onwards

- No.78: <https://www.e-pages.dk/ku/1594>
- No.77: <https://www.e-pages.dk/ku/1587>
- No.76: <https://www.e-pages.dk/ku/1579>
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TASK TEAM ON HAB COMMUNICATION



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During the XVI Session of the IOC-FAO Intergovernmental Panel on Harmful Algal Blooms/IPHAB-XVI (Rome, 27–29 March 2023)

Decision IPHAB-XVI.9 (pp. 22–23), with reference to the HAB Programme Plan, objective 6.1.1 ([IOC/IPHAB-IX.3](#), Annex VII), established a

Task Team on HAB Communication with the following terms of reference (i–ix), alongside the corresponding intersessional activity carried out from April 2023 to March 2025:

ToR i) The new Task Team on HAB Communication will act as the Editorial Board for HAN

Chairs: Beatriz Reguera (Spain) and Eileen Bresnan (UK)*

Suggestions for a more dynamic Newsletter (XVI-IPHAB, 2023)



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1. *A new Board is suggested including TTeams and HAB-related group Chairs, committed ??? to report periodically about their group activities **DONE***
2. *Include a “junior editor” representing the demands of the younger e-generation **DONE***
3. *Explore the possibility of having articles on line as soon as they are accepted**reactivation of communication***
4. *Use a template to facilitate the steps from contributions submission to layout **SOON***





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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 71:
August 30, 2022

DOI: <https://doi.org/10.5281/zenodo.6782899>

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DOI: <https://doi.org/10.5281/zenodo.14883731>

Deadline to submit material for next issue
1 May 2025

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

Before XVI- IPHAB 2023;

13 Regional Editores

After 16th IPHAB (2023):

13 Regional Editores

+

19 IPHAB-related chairs

- (2) IPHAB Chair & Vicechair
- (7) Task-Teams
- (4) IOC –HAB Regional Groups
- (6) IOC-related bodies

Improving communication with the Editorial Board and readers



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In July 2024, Eileen Bresnan stepped down for professional reasons
Kenneth Mertens (France) accepted to be the new Co-Editor in Chief

De Kenneth MERTENS (via han-mailing-list Mailing List) <han-mailing-list@listes.ifremer.fr> 

 Responder

A han-mailing-list@listes.ifremer.fr 

Asunto **Re: [han-mailing-list] First Online Meeting of the Task Team on Harmful Algal Bloom (HAB) Communication**

List-ID <han-mailing-list.listes.ifremer.fr>

- First online meeting of the TT (2 different time zone hours plus one in Spanish with Latinamerican EB members) in October 2024)
- Second meeting in January 2025
- HAN is now posted on social media (LinkedIn, X) in addition to previous dissemination through Ocean Expert Portal.



Kenneth Mertens
New Co-editor in Chief

ToR v) Regional editors are expected to actively follow up on HAB events, such as those appearing in the media, within their respective regions and identify appropriate experts to write articles for HAN—or alternatively, write them themselves based on compiled information and references.

This task needs to be reactivated to address the weak participation of many new Editorial Board members. Two online meetings (in October and January) were held, inviting all Editorial Board members to share their interests and provide new ideas.



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Types of Contributions and New Guide for Authors (English, French and Spanish)

The range of contribution types expanded to ensure inclusivity for news, opinions, and reports on events and ongoing activities related to the impacts of harmful algae and their toxins.

- Feature articles:** Invited contribution from a well recognized expert
- Reports on new events, species, toxins, or impacts** detected anywhere, or **Emerging Issues:** well-known species, toxins, or syndromes affecting a new area for the first time.
- ICHA Highlights**
- HAB-related IOC Programmes: updates from GlobalHAB**
- Project Reports: Includes IOC Initiatives, working groups and workshops Training and Networking activities**
- Red Tides Archives**
- HAB Expert interviews**
- Opinions**
- Book Reviews**



Planning for the year

- Submission deadline
- △ Estimated publication

January						
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HAN Issues Intersessional period IPHAB 2023 - 2025

HAN 72, 73, 74 (2023)

Harmful Algae News

AN IOC NEWSLETTER ON TOXIC ALGAL AND ALGAL BLOOMS
No. 72 • May 2023 • <https://habioc-unesco.org/>

Florida's West Coast *Karenia brevis* bloom – Spring 2023

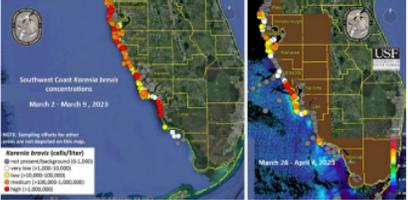


Fig. 1. Mapped *Karenia brevis* cell concentrations 26 days apart in March 2023. Note the offshore stations on 28 March to 4 April 2023 (gray circles right panel) have no *K. brevis* cells in surface samples. <https://floridatides.gov/algobloom>

On the morning of 6 March 2023, the National Centers for Coastal Ocean Science (NOAA) issued an alert warning of "moderate to high risk of respiratory irritation" due to a *Karenia brevis* bloom along the southwest coast of Florida. This was no surprise to the many beachgoers who walk Florida's shorelines every day and frequently see dead fish washed up on the beaches during harmful algal blooms (HABs). The city or municipal government of the small towns along the west Florida coast routinely budget for beach clean ups during the yearly annual harmful algal blooms. But dead fish are especially problematic during peak holiday seasons or, in this case, spring break week(s) when schools recess and many visitors flock to Florida's wide, warm beaches. The "halo" effect of HABs can cause significant losses in revenue as the news, often exaggerated, is broadcast.

In an interview with the Washington Post (reported by A. Ajasa) Dr. Rick Stumpf (NOAA) noted that *K. brevis* cells often accumulate inshore in late summer and are pushed offshore to the mid shelf area of Florida's west coast by winter winds associated with high-pressure systems [1,2] the persistent northerly winds do not occur

K. brevis cells remain inshore, Stumpf speculates this is what happened in March 2023. It should be noted that while *K. brevis* blooms are known to occur at all seasons of the year, there are times when they are more frequent. High inshore cell concentrations are affected by wind patterns of frontal systems, hydrographic conditions like upwelling and in turn, nutrients upwelled to the surface waters [3]. Stumpf added "If you have a year where we don't get those persistent northerly winds pushing it out it [HABs] can hang around. And that's what's happening this year"

Florida's coast lines are some of the most closely observed marine areas. A number of State, Federal and non-governmental organizations and university programs contribute their resources to help forewarn citizens, public health officials, resource managers, property owners and tourists of conditions that are conducive to HABs (see below). These agencies also have willing volunteers who serve as citizen scientists and help crowd source data along vast stretches of the 1,062 km west Florida coastline. The most recent reports of the spring 2023 *K. brevis* blooms show a decline in the cell concentrations nearshore and no reports of surface



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Harmful Algae News

AN IOC NEWSLETTER ON TOXIC ALGAL AND ALGAL BLOOMS
No. 73 • October 2023 • <https://habioc-unesco.org/>

Rapid response to a massive marine mammal stranding event associated with domoic acid poisoning in central to southern California

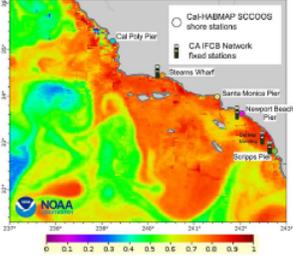



Fig. 1: a) NOAA CoastWatch California-Harmful Algae Risk Mapping (SHARM) system prediction of pDA risk (red = higher risk) on 9 June 2023; b) SHARM tracked the news of the DA event from SLO to San Diego Counties. SCCOOS Cal-HABMAP and CA Imaging FlowCytobot (IFCB) Network stations are labeled with a circle and IFCB icon. c) (foreground) CSLA displaying signs of domoic acid poisoning and (background) a deceased long-beaked common dolphin. Credit: CIMWI; d) beached long-beaked common dolphin. Credit: CIMWI.



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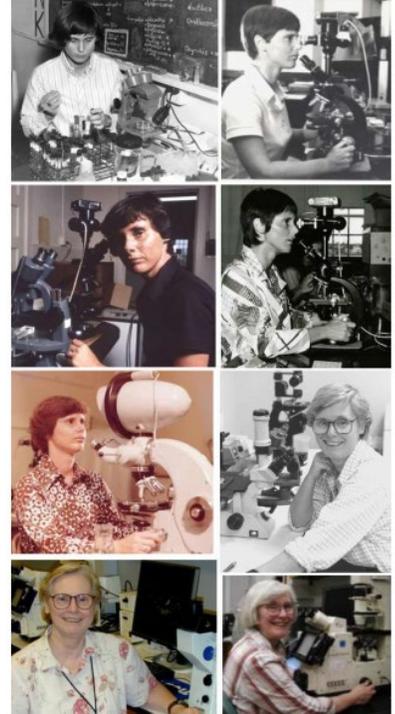
Special Issue on Karen
Steidinger 29

**NEW! Book on Marine Benthic
Dinoflagellates (see page 4)**

Harmful Algae News

AN IOC NEWSLETTER ON TOXIC ALGAL AND ALGAL BLOOMS
No. 74 • December 2023 • <https://habioc-unesco.org/>

Karen A. Steidinger The Legacy of a HAB Pioneer and Visionary



Karen at the microscope through the decades (1960s onwards). Photo credits: Fish & Wildlife Research Institute, Florida Fish & Wildlife Conservation Commission.



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**Karen A. Steidinger:
The Legacy of a HAB Pioneer
and Visionary**
Editors: Jan Landsberg
and Patricia Tester 1

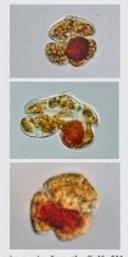
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Karenia species from the Gulf of Mexico:
1. *K. brevis*; 2. *K. papilliferensis*;
3. *K. setiformis*.
Credit: FW-CFWRI-HAB Group



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No. 75 - April 2024 · <https://hab.ioc-unesco.org/>

Sato-Umi or Harmony with Nature 20th ICHA, Hiroshima 2023



Torii gate that welcomes visitors to the Itsukushima Shrine Island (Miyajima), UNESCO World Heritage at Hiroshima, Seto Inland Sea. Photo E. Iriensan

As the global outbreak of the novel coronavirus (COVID-19) had finally calmed down, the 20th International Conference on Harmful Algae (ICHA 2023) was held in Hiroshima, Japan, bringing together more than 500 participants from 40 countries around the world for the first time in five years. The Local Organizing Committee (LOC), chaired by Prof Ichiro Imai and the Scientific Committee (SC) of ICHA 2023 would like

to express their gratitude to the ISSHA Council executives and participants for their various forms of cooperation. During the preparation of ICHA 2023, the LOC has been facing difficulties derived from the COVID-19 pandemic and rising prices in travelling costs. In this exceptional situation, we appreciate ISSHA members understanding about our giving up the original plan of an online and in person hybrid meeting



Local Organizing Committee for the 20th ICHA. From left to right: Satoshi Nagai (Vicechair), Kazuhiro Koike (Vicechair), Masao Adachi (Chair of program committee), Toshiyuki Suzuki (Vicechair), Ichiro Imai (Chair), Natsu Nakayama (secretariat) and Shigeru Itakura. Photo LOC ICHA 2023.



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Harmful Algae News

AN IOC NEWSLETTER ON TOXIC ALGAE AND ALGAL BLOOMS
No. 76 - August 2024 · <https://hab.ioc-unesco.org/>

Macroalgal blooms, dystrophy, discolourations and fish kills in a Tyrrhenian lagoon



Fig. 1. Collection of dead fish from an extensive dystrophic event in Orbetello Lagoon, Italy, July 2024

Some coastal lagoons have undergone strong processes of anthropic change with the result that they have been transformed from mesotrophic to eutrophic and, eventually, hypertrophic environments. This, by altering their typically resilient euryhaline and eurythermic biocoenoses, has favoured the dominance of *faecies* of opportunistic species, microphytes and macroalgae, with impressive vegetative development [1].

Some of these species decay rapidly with rising summer temperatures, mainly as a result of increased bacterial activity [2]. The high organic load on the sediments triggers anaerobic bacterial processes that first lead to the formation of ammonia and rapidly to sulphate reduction and production of hydrogen sulphide. This last process produces dystrophy, kills the sediment fauna and even the vagile fauna if it does not be-



Fig. 2. Orbetello lagoon with its three basin-lagoon canals (sic), two in the West basin and one in the East basin



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NEW!



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New toxic species - and what about their names?

News from the IOC-UNESCO Task Team on Algal Taxonomy

The IOC-UNESCO Taxonomic Reference List of Harmful Micro Algae (available via the *HAB Index*) is an actively maintained and comprehensive list of all microalgae known to produce toxins. It may serve as a starting point for assessing toxicogenic microalgae. It provides up-to-date and accurate nomenclature.

The list presently includes 116 dinoflagellates, 43 cyanobacteria, 31 diatoms, eight haptophytes, seven raphidophytes, and three dictyochophytes, and the number is steadily increasing. A group of editors (listed below) continuously updates the list and welcomes suggestions for modifications.

Before reviewing the changes to the list over the past few years, the editorial team would like to extend a heartfelt thank you to Santi Fraga for his invaluable contributions as the editor of the *Alexandrium* group!

We also welcome new editors: Shaua Murray (responsible for the Amphidinales), Urban Tillman (responsible for the Thoracosphaerales, Feridinales) and Rafael Salas (responsible for the Thoracosphaerales) - thank you for joining the team!

Recently, we have begun updating information on each species by adding details on morphology, particularly features important for accurate identification, including micrographs. Information on resting stages (cysts, akinetes, etc.) has been included, as well as references to selected GenBank sequences, preferably from or near the type locality. Furthermore, we are working on including more cyanobacteria, this section of the list remains incomplete, particularly concerning freshwater species. Additionally, the list has been updated

to reflect that several species have been confirmed to be toxigenic (Table 1).

Additions to the list (in red: recently described species, in black: species not recently described but newly identified as toxic):

- Dinoflagellates:**
 - Alexandrium fragae*, *A. limii*, *A. agatae*, *A. taylorii*
 - Centrodinium punctatum*
 - Gambieridiscus caribaevus* and *G. silvae* (new algal CTX-toxin: CTX5), *G. cheloniae*, *G. holmesii*, *G. honu*, *G. lewisii*
 - Gonyaulax bohaiensis*, *G. taylorii*
 - Prorocentrum capripinum*, *P. jakupovi*, *P. porosum*, *P. steidingeriae*
 - Coccoloba malayensis*
 - Amphidinium magnum*, *A. pseudo-massartii*, *A. tomasii*

- Diatoms:**
 - Pseudo-nitzschia bipertita*, *P. punctonitii*, *P. simulans*, *P. subcurvata*

- Raphidophytes:**
 - Chattorella malayana*

Additional modifications to the list are outlined below:

- Some species have been renamed**
 - Karenia digitata* has been transferred to *Parvodinium digitatum*.
 - Karenia umbella* is a junior synonym of *Karenia longicaulis*.
 - Lingulodinium polyedra* is now renamed *Lingulaulax polyedra*. *Lingulaulax polyedra* is a new name for *Lingulodinium polyedra*; as such, the genus *Lingulodinium* Wall 1967 is retained in its exclusively fossil status [1].



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No. 78 – February 2025 • <https://hab.ioc-unesco.org/>

Dinoflagellate Blooms and Spinning Fish Coincide with *Sargassum* Inundation, Nitrogen Enrichment and Ocean Warming in the Florida Keys, USA

Harmful algal blooms (HABs) negative impacts on public health, recreation, tourism, fishery, aquaculture, and ecosystems have increased worldwide over the last decades [1]. In subtropical Florida, blooms of cyanobacteria (*Microcystis*, *Synechococcus*, *Lyngbya*), red tides (*Karenia brevis*), brown tides (*Aureoumbra lagunensis*), golden tides (pelagic *Sargassum*) and a variety of benthic macroalgae (*Laurencia*, *Gracilaria*, *Dictyota*, *Wrightiella*, *Cladophora*, *Caulerpa*) have increased in severity in the wake of human population growth over decades. This article provides a brief background of the HABs that have developed in the coastal waters of the Florida Keys ("the Keys"), an island archipelago downstream of the Everglades in southernmost Florida. The coastal waters of the Keys were historically oligotrophic and encompass the majority of the third-longest coral reef in the world, the Florida Reef Tract, which extends 563 kms from the St. Lucie Inlet

on the east coast to the Dry Tortugas National Park west of Key West, FL. The sequence of HABs reached a new level of risk in the Lower Keys in 2023/2024 when unprecedented observations of "spinning fish" and fish kills, most notably the critically endangered small-tooth sawfish (*Pristis pectinata*), were increasingly reported on social media, local U.S. and national news outlets (<https://x.com/NBCNightlyNews/status/1773861243754873069?mx=2>). Local nutrient pollution from human waste, mainly from leaking septic systems, was first identified as a driver of excessive phytoplankton and macroalgal HABs in the Keys during the 1980s. The resulting eutrophication contributed to low dissolved oxygen and the early stages of seagrass and coral reef die-off [2]. HAB events increased dramatically in the early and mid-1990s when water managers adopted policies to increase freshwater flows from Lake Okeechobee south to Florida Bay and the Keys to re-

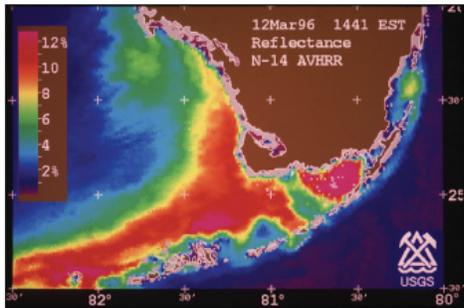


Fig. 1. AVHRR reflectance image from March 12 1996 showing a high-turbidity plume from Shark River Slough extending beyond the Lower Florida Keys towards the Dry Tortugas.



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HAN Editors are in contact with;

- ❑ ISSHA President to ensure a timely publication of the Conference Highlights
- ❑ Local organizers of the 21st ICHA, October 2025 (Chair: L. Guzmán) and have expressed their support for any requests regarding the publication of ICHA proceedings (2-page contributions) in HAN

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**New toxic species
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a Latin description nor a reference to a type. However, it is only valid under the zoological code if it was clear that Halim considered *Alexandrium* as an animal. Recent phylogenetic analyses reveal that *Centrodinium punctatum* is nested within *Alexandrium*, and since *Centrodinium* (described in 1907) pre-dates *Alexandrium* (described in 1960), it has priority.

To make a short story long, several solutions were considered to avoid changing the name *Alexandrium*, which has been used in thousands of publications; therefore, preserving its name is essential for nomenclatural stability. A solution has hopefully now been found, as a paper is being published supporting that *Alexandrium* should be treated as an animal according to Halim (1960) and thus agreeing with the Zoological Code. The final acceptance depends on a vote in the Commission of the Zoological Code (Gottsching, M. & Eibrächter, M. (in press) Case 3886 — *Alexandrium* Halim, 1960 (Dinoflagellata, GONYAULACIDAE): confirmation of treatment as an animal taxon. – Bulletin of Zoological Nomenclature 81).

A new list of harmful but non-toxic species

The scientific and managerial communities have for a long time requested

acts on the health of marine fish and other animals, causing harm due to e.g. cell barbs and spines, anoxia, or other mechanisms not involving toxins. This first list, now completed, comprises 55 species (23 diatoms, 25 dinoflagellates and seven from other groups), and covers 106 documented events or cases. The second list, currently in preparation, will include species responsible for seawater discoloration, mucilage,

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<https://doi.org/10.5281/zenodo.14363545>



Øyvind Moestrup (past Chair) and Nina Lundholm, Chair of the Task Team on Taxonomy, enjoying Japanese food during a break at the 20th ICHA, Hiroshima, November 2023.

New HAN co-Editor-in-Chief

Kenneth Neil Mertens, originally from Belgium, has been a researcher at Ifremer since 2016. He completed his PhD on dinoflagellate cysts, which laid the foundation for his continued research on dinoflagellate taxonomy and paleoecological applications. Kenneth's work primarily focuses on understanding the ecological roles of dinoflagellates, their identification through molecular techniques, and their use in reconstructing past environmental conditions. Currently

based at Concarneau, France, he contributes to various international projects examining the impacts of harmful algal blooms and the use of dinoflagellates as bioindicators of environmental change. Now serving as the new co-editor in chief of *Harmful Algae News*, Kenneth takes over the role from Eileen Bresnan, whose dedicated service has been invaluable. He looks forward to continuing the journal's legacy, advancing research in harmful algal blooms, and fostering

collaboration among scientists worldwide.



Kenneth Neil Mertens

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 Beatriz Reguera
 Kenneth N. Mertens

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DOI: <https://doi.org/10.5281/zenodo.14283204>

Deadline to submit material for next issue
 1 February 2025

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



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HAN 77: First time individual *dois* for articles which are directly picked up in Google Scholar

RECOMMENDATIONS



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- Modify the Task Team member list: Beatriz Reguera (Spain) and Kenneth Mertens (France) to become Co-Chairs of the Task Team. A new member of the Regional Board must be nominated to replace Pat Tester (USA)
- Task Team and Regional Working Group Chairs must commit to providing HAN editors with tentative dates for their upcoming contributions to the newsletter in the forthcoming months/year.
- Strengthen collaboration with IAEA and FAO to ensure their HAB-related cooperation projects and training activities are disseminated via HAN.



THANK YOU

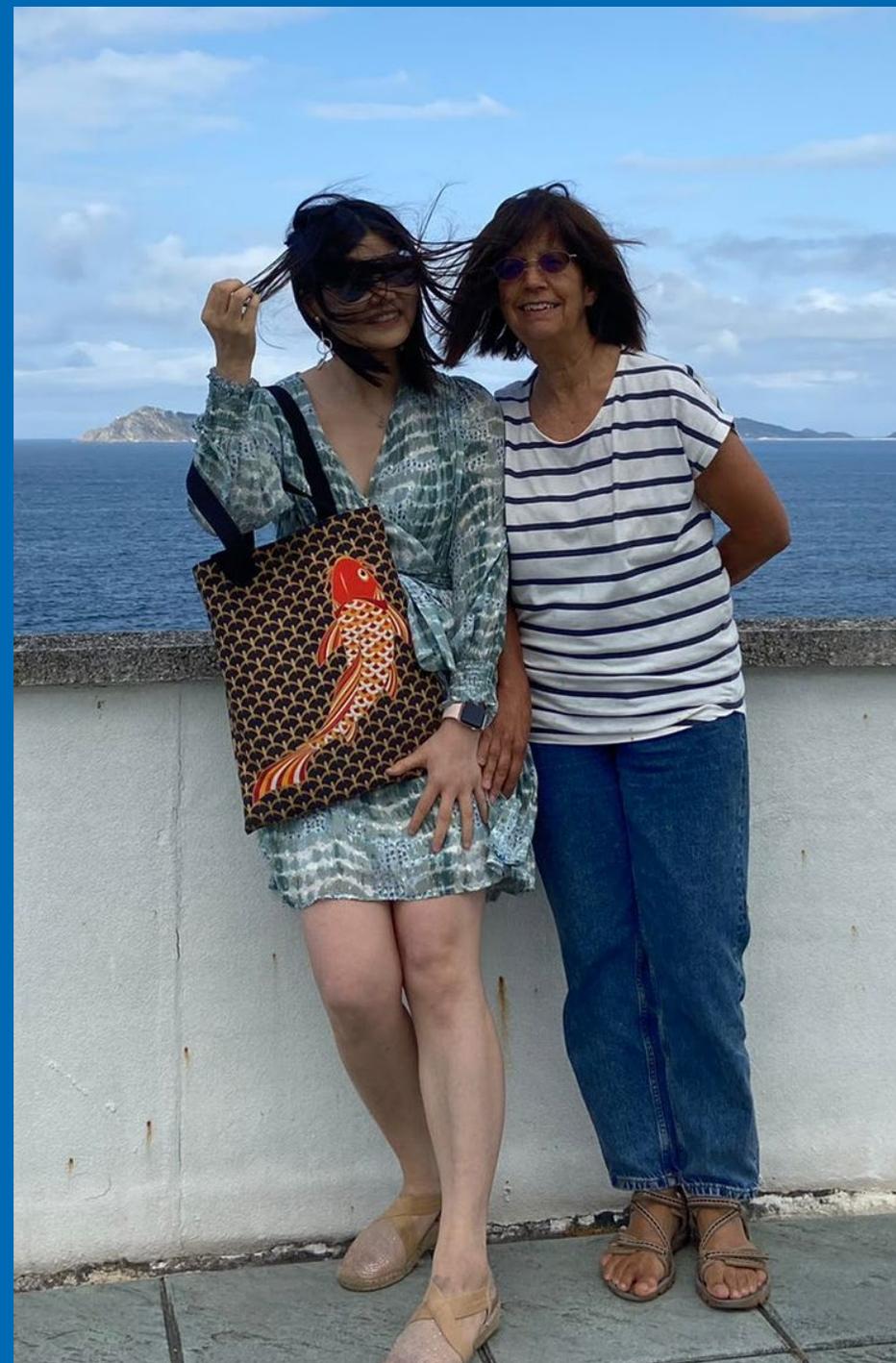
THANKS TO:

SUN YUN (Associate Programme Specialist)

LEIF BOLDING (HAN Layout)

HENRIK ENEVOLDSEN (HAB Programme Coordinator)

Sun Yun & Beatriz Reguera
IEO (CSIC) Vigo 2022



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