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INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION

(of UNESCO)

USER GUIDE FOR HAEDAT

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1. What is HAEDAT?

The Harmful Algal Event Database (HAEDAT) is a component of the IOC Harmful Algal Information System (HAIS). It is a meta database containing records of harmful algal events. It is the only existing open access database storing information about harmful algal events from across the globe. Each country has a national editor who collates data into 'events' and updates HAEDAT annually. These data come from a variety of sources including monitoring programmes, research projects and reports from industry and members of the public. It is important to record the metadata associated with the HAEDAT event data in a document that is available online. It should include information about monitoring practices, any changes that have been implemented in monitoring programs, or changes to the relevant industries involved. A link to the document can be placed in the 'Additional harmful effect information' field when adding an event.

A harmful algal event has a strict definition and must be associated with a negative or harmful impact on industry, biota or society. For example, the presence of toxin producing species not associated with any impact on biota, or levels of microalgal toxins in shellfish below regulatory limits are not considered harmful algal events to be entered in HAEDAT.

A HAEDAT event must meet at least one of the criteria listed below:

a. water discoloration, scum or foam causing a socio-economic impact due to the presence of toxin producing or harmful microalgae;

b. precautionary closures of shellfish harvesting areas due to the presence of algal toxins and/or presence of potentially harmful microalgae;

c. biotoxin accumulation in seafood above levels considered safe for human consumption;

d. any event where humans, animals or other organisms are negatively affected by microalgae.

2. Main Functions within HAEDAT

HAEDAT has a number of functions that facilitates users to search and extract data. These are located in the different tabs on the front page of HAEDAT, highlighted by a red box in Figure 1.

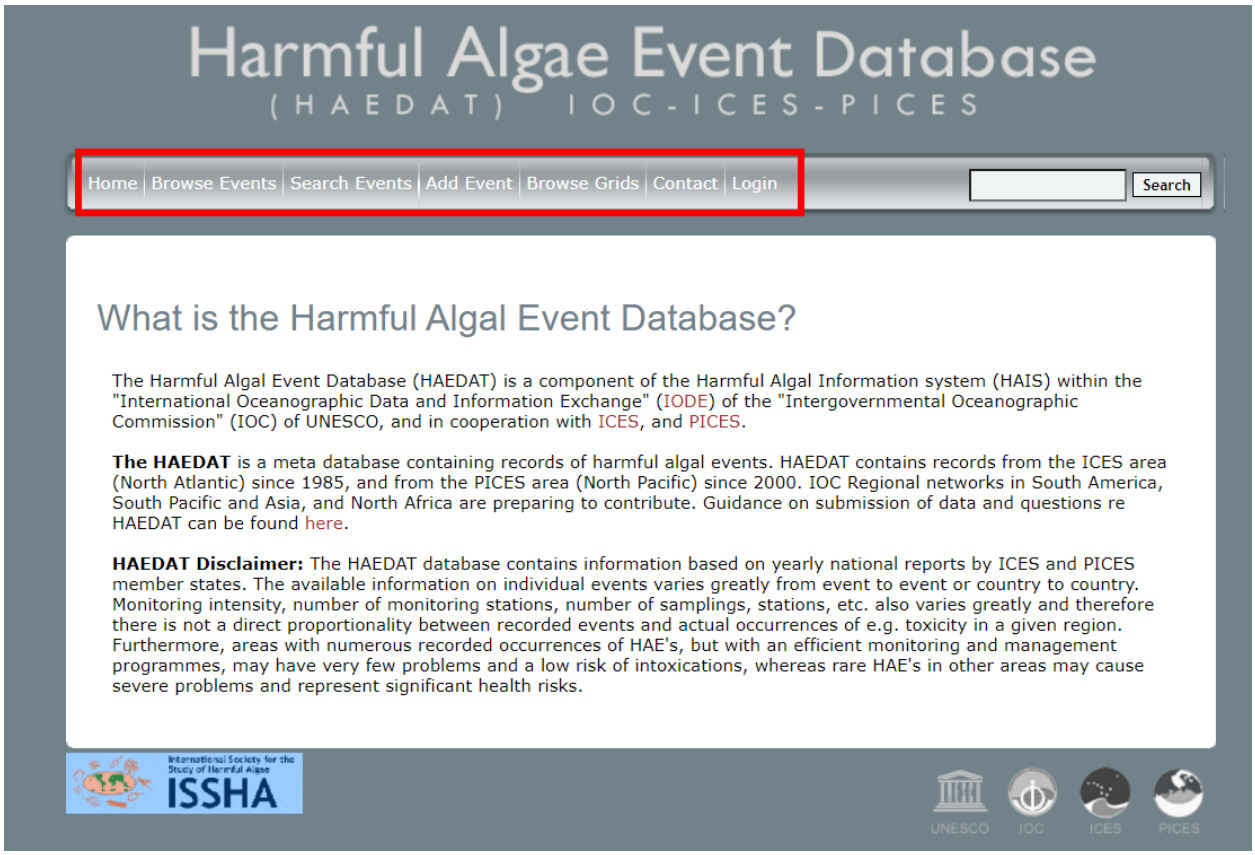
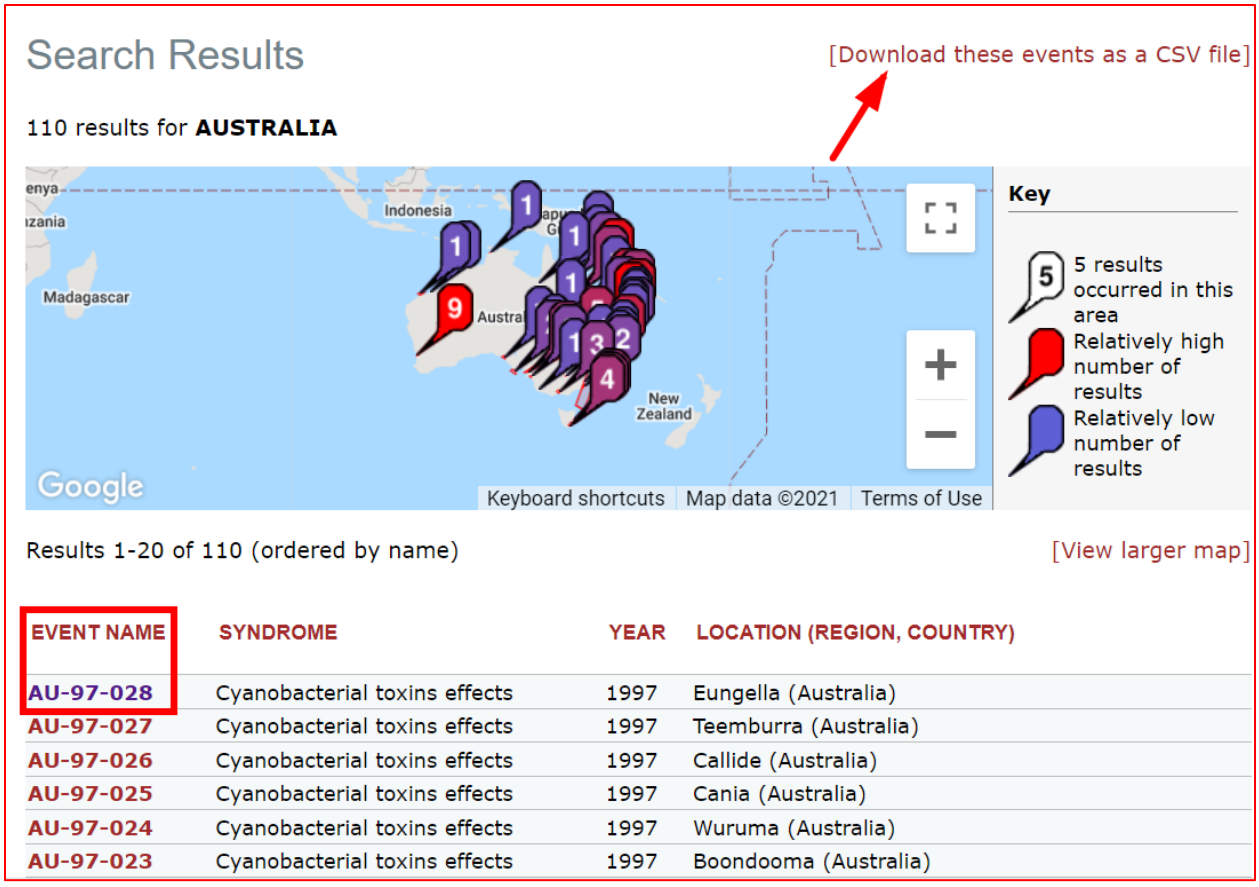


Figure 1: HAEDAT front page

Browse Events

You can browse all the harmful algal events in the database by country, Ocean Biodiversity Information System （OBIS）region, syndrome, nature and year. For example, if you want to browse the events in Australia, click the country name and the results page as in Figure 2 is displayed. You can click each event name for detailed information of that particular event or you can download all these events a CSV file for further analysis. You can also select the bubble with the number of events in each area to call up those discrete events. The relevant links are highlighted in Figure 2.



EVENT NAME	SYNDROME	YEAR	LOCATION (REGION, COUNTRY)
AU-97-028	Cyanobacterial toxins effects	1997	Eungella (Australia)
AU-97-027	Cyanobacterial toxins effects	1997	Teemburra (Australia)
AU-97-026	Cyanobacterial toxins effects	1997	Callide (Australia)
AU-97-025	Cyanobacterial toxins effects	1997	Cania (Australia)
AU-97-024	Cyanobacterial toxins effects	1997	Wuruma (Australia)
AU-97-023	Cyanobacterial toxins effects	1997	Boondooma (Australia)

Figure 2. HAEDAT results after searching for 'Australia'

The dataset can also be searched using regional IOC HAB networks and OBIS regions; Abbreviations for these are:

IOC HAB networks

ANCA (Caribbean network);

FANSA (South American network);

HANA (North African network);

ICES: NEA, (North East Atlantic including the North Sea and Baltic areas);

ICES: NWA, covers the North West Atlantic including the Gulf of Mexico;

PICES: NEP, covers the North East Pacific;

PICES: NWP, covers the North West Pacific.

OBIS regions

Region 1 (ECA)East Coast America;

Region 2 (CCA) Central American Caribbean;

Region 3 (SAM) South America;

Region 4 (WCA) West Coast America;

Region 5 (ANZ) Australia New Zealand;

Region 6 (SEA) Southeast Asia;

Region 7 (NAS) North Asia;

Region 8 (Indian Ocean);

Region 9 (Benguela);

Region 10 (West Coast Africa);

Region 11 (MED) Mediterranean;

Region 12 (EUR) Europe;

Region 13 (PAC) Pacific/Oceania.

Search Events

This function offers diverse and detailed options for searching events, including by nature of the event, resources impacted, location, causative species and toxin syndromes involved. It should be noted that the toxin syndromes are used to refer to the microalgal toxins associated with management actions and only refer to human intoxication events in a small number of cases.

Add Event

- National editors

Only a national editor can add an event to HAEDAT. If you are not a national editor contact Henrik Enevoldsen at the IOC HAB office for more information.

- Entering data

Each HAEDAT record consists of data entered over two pages. Data fields which are obligatory to enter are marked with an asterisk. It is not possible to complete

the data entry without completing these fields. In this user guide, mandatory fields are highlighted in bold font.

It is important to note that raw data are aggregated into 'harmful algal events' prior to entry into HAEDAT. Some algal blooms can have a wide geographic range, impacting a wide geographic range. In some instances, multiple impacts can be recorded e.g., events causing water discoloration, closures of shellfish harvesting areas as well as mortalities of marine biota. The duration of events can be prolonged and can continue into the following calendar year. These data are aggregated into one 'event' based on expert judgement which is entered into HAEDAT.

To add information into the database, please first login in and then click 'Add Event' button. For detailed information, please refer to section 3 "How to add an event in HAEDAT" of this user guide.

Browse Grids

Most countries have divided their coastline in different spatial grids for data aggregation. In some instances, dividing up regions into units of roughly equal length, in others to match how their monitoring programmes are organized spatially. Therefore, there are no defined rules as to how to define these grids. It depends entirely on the how sampling and management is organized in each country. This needs to be considered when interpreting data from different countries. This information should be included in the metadata document. Contact us if you need to add or modify grids along the coastline of the country you can edit records for.

Contact

If you have a problem/enquiry, please contact Henrik Enevoldsen at h.enevoldsen@unesco.org.

Login

User accounts and log-in is provided typically to one data editor per country. However, some countries with several regions may have more than one editor. An editor can only submit data from their own country. If you do not have an account and have the mandate to report for your country or region, please contact us. Login is necessary to add data/events to HAEDAT.

3. How to add an event to HAEDAT

Here we list all the fields for entering an event record in HAEDAT and how they relate to data extraction and interpretation. Data fields marked with an asterisk (*) and highlighted in bold are mandatory and must be filled in to complete the entry of a HAEDAT record. Those data fields not marked with an * are optional.

You may not be able to fill in all the data fields. However, please enter all the information that you do have about the event you are adding to aid interpretation of data when extracted from HAEDAT.

Prior to entry of a HAEDAT record, original raw monitoring data or reports from the public or research programmes must be summarized into one event. For example:

- Closures shellfish harvesting areas due to levels of algal toxins above regulatory thresholds may extend over a large area due to a single bloom. This should be entered as one 'event' covering multiple HAEDAT areas or within the same HAEDAT area (again as one 'event') as appropriate.
- A bloom of harmful algae could have multiple impacts e.g. with closures of shellfish harvesting areas and human illness associated with the same bloom. In this case this is entered as one 'event' with the multiple relevant impacts instead of multiple events.
- In some instances a bloom of toxin producing microalgae can advect in and out of a shellfish harvesting area with the harvesting of shellfish banned due to toxins exceeding regulatory limits, harvesting reopening as toxin levels decline and then being re-implemented again as toxin levels once more exceed regulatory thresholds. In this instance the editor applies expert judgement as to if this is one 'event' over a long period or due to multiple discrete blooms and thus is entered as more than one 'event'.

The online form includes two parts, Part 1 is composed of General Information, Location & Date and Microalgae. Part 2 includes Environmental Conditions and Toxin Assay Information. After finishing Part 1, you can click' Proceed to Next Step' to continue with Part 2 based on the premise that all mandatory fields are filled.

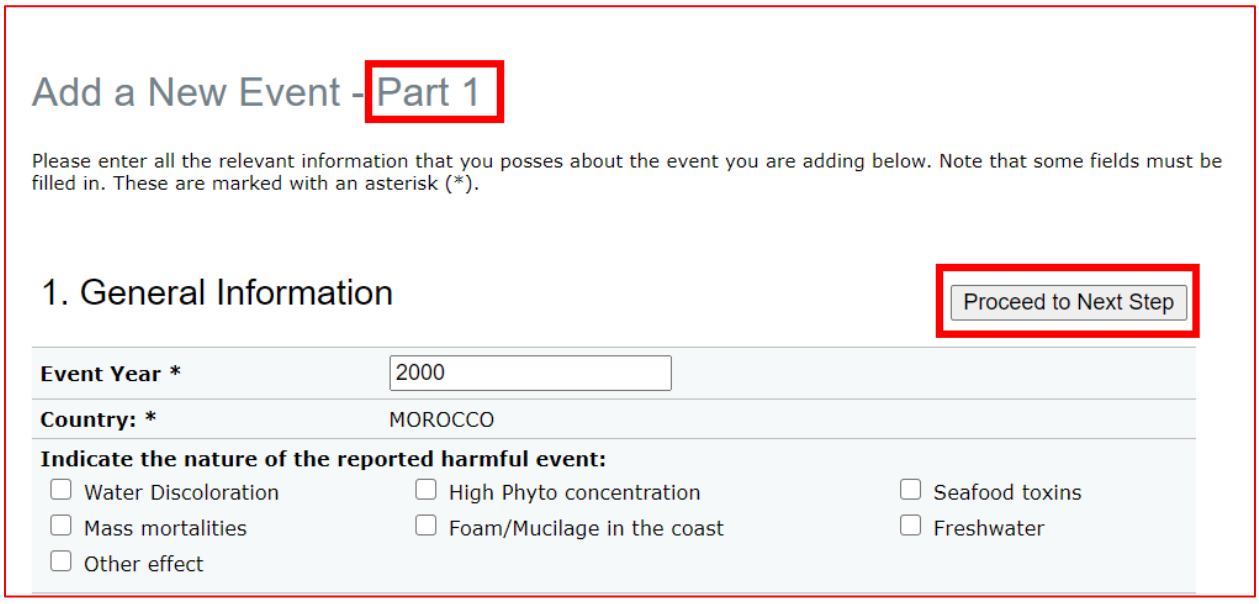


Figure 3. 'Add a New Event' page

General information

1. **Event year*: Mandatory,** the number should be between 1600 and the current year.
2. **Country*:** HAEDAT will match the country name automatically with the editor information when you log in. Hence, although mandatory, there is no need to fill in this field.
3. Indicate the nature of the reported harmful event: This data field is currently marked as optional however this information is very important for filtering/extracting data from HAEDAT and so should be entered. It is also possible to tick more than one field as appropriate e.g. 'seafood toxin and 'mass mortalities' etc.

   **High Phyto concentration has been used to record different types of events in HAEDAT. Some countries have used this to record high biomass blooms, while others have used this to record events when trigger levels of toxin producing species are exceeded (some as little as < 1000cells/L). IOC is working on the definition of this category.
4. Has the event directly affected: This data field is optional but is an important field for filtering/searching HAEDAT data during extraction. Again, more than one data field can be ticked. For example the same 'mass mortalities' event can impact shellfish, farmed fish, aquaculture fish and benthic life. All should be ticked as appropriate.
5. Has any toxicity been detected: Either 'Yes' or 'No' must be ticked here. This field is important for data extraction and filtering so should be entered.
6. Associated syndrome: This field is currently optional but is important for data extraction, mapping and searching.

   The different fields represent events associated with toxins associated with the different shellfish poisoning syndromes e.g. toxins associated with Paralytic Shellfish Poisoning (PSP), toxins associated with Diarrhetic Shellfish Poisoning. The majority of these records are closures of shellfish harvesting areas due to levels of toxins above regulatory thresholds and not incidents of human illness/mortalities e.g. to PSP.

   Cyanobacterial blooms are also recorded in this category by ticking 'Cyanobacterial toxin effects'. HAEDAT holds information about cyanobacterial events in the marine/brackish water environment as well as small number of events from freshwater environments.

   Human health impacts and fishery closures due to ciguatoxins and maitaitoxins are both recorded by ticking Ciguatera Poisoning (CFP).

   Currently there is no category to tick in this section associated with Yessotoxins (YTX). In instance 'Other' should be ticked and YTX listed in the 'Toxin Assay Information section.
7. Unexplained toxicity: Optional, select Yes/No from the list. If 'Unexplained toxicity' has been ticked provide some details in the dialogue box.
8. If intoxications occurred, please indicate the species implicated in the transmission of toxins (transvector): Optional, free text.

9. Is this report the outcome of a monitoring programme?: Optional, give as complete name of monitoring programme as possible.
10. Has the event occurred before in this location? Optional, Yes/No and comments
11. **Individuals to contact*: Mandatory**, select contact from the existing list or add a new contact if you could not find it in the list. National editors can add/remove names to this list and the contact information for each country should be reviewed as contact people leave their relevant positions.

Location & Date

1. Location: Optional, give latitude and longitude if possible. In some instances the spatial extent of the bloom can be quite large and so entering just one latitude and longitude may not be appropriate. More information about the spatial area of the event can be provided in the 'Additional location information' text box below. The most important location information is the HAEDAT area code.
2. **General location information*: Mandatory.** Select HAEDAT Area code. When an event covers more than one area code, multiple area codes can be selected by holding down the 'Ctrl' button and ticking on the relevant codes.
3. When reporting location, do so according to geographic region. For example: Name of the Area: Rias of Vigo and Muros; Region: Galicia, Northwest Spain; HAB Area code: ES-07 & ES-08.
4. Additional location information: Optional. This section can contain information to support the 'General location information' field.
5. Event date: Optional but important**.** This data is important for data analysis and should be entered if possible.
6. Start of bloom event: / End of bloom event: / Date of detection of quarantine levels: / End of quarantine levels: / Additional date-related information: Optional. Data should be entered in all of these fields if available to aid data analysis when extracted. It is acknowledged that not all of these data may be available.

Microalgae

These data fields are optional and should be entered if the data is available.

1. Causative organism known? Optional, Yes/no
2. Causative Species/genus Cells/L (max.): Optional. Only species suspected of causing the 'event' should be added in this field. You can click 'Add row' to add more species as necessary

3. Co-Occurring Species/genus Cells/L (max.): Optional. These species are not associated with the event. You can click 'Add row' to add as many species as necessary.
4. Chlorophyll concentration, if known (µg/l): Optional
5. Additional microalgae information: Optional, more information about the event can be entered here.
6. Event-related bibliography: If anything about the event has been published, add the references/links here.

Environmental Conditions (Optional and very valuable if you have them)

These data fields are optional and should be entered if the data is available.

1. Weather/Turbidity/Wind direction/Stratified/Oxygen content/ Wind velocity/ Temperature/Oxygen saturation/Current Direction/Secchi disk/Salinity/Current Velocity
2. Nutrient concentrations: Ensure units are added when entering this information.
3. Additional bloom information
4. maximum/minimum temperature and salinity recorded during the whole duration of the event
5. Bloom location in the water column
6. Growth
7. Advected comments
8. Additional Environmental information

Toxin Assay Information (Optional and very valuable if you have them)

These data fields are optional and should be entered if the data is available.

1. A number of data fields are associated with toxin concentration of biota. These include
   - 'Species containing the toxin': These species names are typed in and not chosen from a drop-down list. More than one species can be added however only species where toxin levels have resulted in an 'event' should be entered here. Click on 'add row' to add additional species as appropriate.
   - 'toxin type': this is chosen from a drop-down list
   - 'toxin details': this is chosen from a drop-down list
   - 'max. concentration': When entering the max concentration, it is very important to enter the units associated with the measurement as these have

changed over the years. These will have to be separated after the data has been extracted.

2. Kit used. If a commercially available kit has been used, this information is entered here.
3. Toxin assay comments: Any comments about the Toxin assay are entered here.
4. Economic losses: Information about economic losses is entered here.
5. Management decision: Information about management decisions is entered here.
6. Additional harmful effect information: Metadata associated with the harmful algal event is added here.

Click' Submit Your Event' at the end of the Part 2 once you finish entering data. After submitting, the reminder below would pop up. You can click the Event name in purple to review all the information you have added. If you find something wrong, you can edit this record. Since the removal of the event is an irreversible process, we limit this function only to the system administrator. Contact us(h.enevoldsen@unesco.org) if there's the need to delete the record.

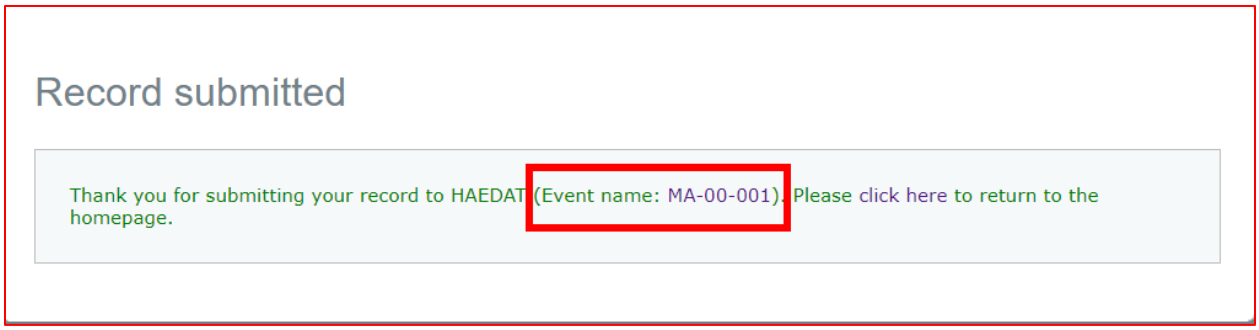


Figure 4. Webpage displayed after submitting the record

Figure 5. Webpage displayed after clicking the Event name

4. How to cite HAEDAT?

- For a single record citation:

Harmful Algae Event Database (6 May 2021). Event record US-04-008. Retrieved from http://haedat.iode.org/viewEvent.php?eventID=1620

- Adding more detail about the event would be fine as well, so for example:

Harmful Algae Event Database (6 May 2021). Event US-04-008 of Prymnesium parvum at Vero Beach, Florida. Retrieved from http://haedat.iode.org/viewEvent.php?eventID=1620

- For the entire website:

Intergovernmental Oceanographic Commission of UNESCO (2021). Harmful Algae Event Database (HAEDAT). http://haedat.iode.org