

## Working Group on Harmful Algal Bloom Dynamics (WGHABD)

**2017/MA2/EPDSG03** The **Working Group on Harmful Algal Bloom Dynamics (WGHABD)**, chaired by Eileen Bresnan, UK, will work on ToRs and generate deliverables as listed in the Table below.

	MEETING DATES	VENUE	REPORTING DETAILS	COMMENTS (CHANGE IN CHAIR, ETC.)
Year 2018	23–26 April	Tarragona, Spain	Interim report by 15 June	
Year 2019			Interim report by DATE	
Year 2020			Final report by DATE	

### ToR descriptors

ToR	Description	Background	Science Plan topics addressed	Duration	Expected Deliverables
A	Deliver National Reports on harmful algal events and bloom dynamics for the years 2017, 2018 and 2019.	HAB events may affect human activities and marine ecosystems at different levels. Understanding can best be achieved by integrating multiyear data sets.		Year 1,2,	Summary of national reports in Annex in WGHABD report. Contribute with reports to HAE-DAT.
B	There are a number of fish killing algae activities underway during the reporting period from 2017–2020 e.g. IP-HAB task team on fish killing algae, fish killing algae colloquium in 2018. Participants involved with these activities will update the WG with progress and a summary will be provided to ICES and the IOC and other relevant WGs	The WG identified a need for a detailed assessment of the scale of the problem and the identification of key knowledge gaps.		Year 1	Work with chair of IP-HAB task team on fish killing algae to produce peer review paper.
C	ICES-PICES-IOC Harmful Algal Event Database (HAE-DAT) – the harmful algal event database will be updated by participants on an annual basis. This database will be used to produce ‘products’ such as spatial descriptions of harmful algal events in the ICES area. Examples include maps of incidence of toxicity and/or mortalities, updates to ICES Ecosystem reviews that can be updated annually or as required.	Data from the ICES area in HAE-DAT has been updated and quality controlled for the 2014–2016 period and historic data entry and QC is almost complete. Outputs from this database will allow the regional and spatial distribution of harmful algal events to be examined.		Year 1,2,3	Outputs on request and as described in ToR D
D	ICES WGHABD will produce a HAB Status Report. This will represent the ICES contribution to the Global HAB Status Report for the North Atlantic area. This will use data and products	Data from the ICES area in HAE-DAT has been updated and quality controlled for the 2014–2016 period and historic data entry and QC is almost complete. Outputs from this database will allow an examination		Year 1, 2,3	Year 1: Data QC complete and plots produced. HAB Status report finalised at 2018 meeting. Year 2: Global HAB

	generated from HAE-DAT and supplementary time series data as appropriate.	of the harmful algal events in the ICES area over the last 25 years.		Status Report launched. Presentation at ISSHA HAB conference, other associated activities as they arise. Year 3. Special issues of Harmful Algae on Global HAB Status report containing papers from the ICES area.
E	Report on new findings in the area of harmful algal bloom dynamics	WG members report new findings on the topic of algal bloom dynamics in the ICES area. This is a particularly valuable ToR for providing the most up-to-date status of HAB dynamics in the ICES area.	Year 1,2,3	A report on new findings in the area of harmful algal bloom dynamics.
F	HABs and the EU Marine Strategy Framework Directive (MSFD). Currently there is no consistent approach in Europe to including HABs in the assessment of GES for the MSFD. A commission decision on the MSFD is pending. .	WGHABD will review the pending EU commission decision and how HABs are included in the MSFD.	Years 1,2,3	Year 1: A section in the WGHABD 2018 report reviewing the the EU commission decision in relation to HABs Year 2-3: Further work driven by outputs from year 1.
G	Review how physical, chemical and biological interactions control the dynamics of selected harmful micro-algae	Harmful algal genera respond to environmental forcing in different ways. During each meeting a different genus will be evaluated to provide a comparative evaluation of known and potential responses to physical / environmental forcing.	Years 1,2,3	Produce summary for ICES report. During Yr 1 – genera will be Gambierdiscus and Fukuyoa.  Species for review during years 2 and 3 will be selected at the preceding meeting.
H	Ciguatera Fish Poisoning (CFP) is an emerging issue in the ICES area. This ToR will provide an update of CFP incidence in the ICES area, new developments in methodology to research the issue, modelling efforts, risk assessments to protect human health, initiatives in other bodies such as IP-HAB, PICES etc.	There are currently a number of initiatives underway examining different aspects of CFP in the ICES area.	Years 1,2,3	Year 1: update to WGHABD on work underway to address this issue in affected areas in Europe.  Year 2 and 3; deliverables pending developments in this area of work.
I	Species specific HAB detection methods and other cutting edge technologies are now moving from research towards operational use. WGHABD will	Optical and molecular methods have been used routinely in HAB context for the 15 years. New state of the art methods have been trialled in the ICES area. Potential	Year 2, 3	Year 3: Output to be decided based on collaboration with other WGs and discussions during

aim towards developing collaborations with other WGs working in this area to optimise practical applications in operational situations.	for collaboration with other WGs.	Year 2.
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## Summary of the Work Plan

Year 1	FINALISE QC OF HAE-DAT DATA, PRODUCTION OF OUTPUTS AND ICES STATUS REPORT. REVIEW EU COMMISSION DECISION AND ROLE OF HABs IN THE MSFD. UPDATE ON ACTIVITIES IN RELATION TO CFP AND IMPLICATIONS FOR THE ICES AREA. PRESENT NATIONAL REPORTS, NEW FINDINGS, COMPLETE HAE-DAT ENTRIES FOR 2017 DATA. WORK WITH IP-HAB TO FINALISE PRODUCTION OF MANUSCRIPT ON FISH KILLING ALGAE, REVIEW HAB GENERA GAMBIERDISCUS AND FUKUYOA.
Year 2	Contribution of ICES input to the Global HAB Status Report and input into activities around its launch. Agree associated peer review publications to be produced for year 3. Activities on HABs and MSFD, and CFP as decided in Year 1. Present national reports, new findings, complete HAE-DAT entries for 2018 data. Review of Hab genera to be decided. Communicate with other WGs with regard to ToR I. Respond to advisory requests as appropriate.
Year 3	Production of peer review publications for Global HAB Status Report special issue. Input to associated activities as appropriate. Activities on Habs and MSFD and CFP as decided in Year 2. Present national reports, new findings, complete HAE-DAT entries for 2019 data. Review of Hab genera to be decided. Participate in activity associated with ToR I.

## Supporting information

Priority	The current activities of this WG address the strategic goals 1,2 and 3 in the ICES strategic plan. Output from this WG also represents the contribution from ICES at a number of forums (e.g. UNESCO-IOC) which consider problems associated with HABs at a global scale. The WG is also producing the contribution from the ICES area to the Global HAB Status report currently being produced by the IOC.
Resource requirements	The research programmes which provide the main input to this group are already underway, and resources are already committed. The additional resource required to undertake additional activities in the framework of this group is negligible.
Participants	The Group is normally attended by some 20–25 members and guests.
Secretariat facilities	None.
Financial	No financial implications.
Linkages to ACOM and groups under ACOM	Output from HAE-DAT and ICES HAB status report will provide material for ACOM should requests for advice require consideration of impacts from HABs. .
Linkages to other committees or groups	There is a working relationship with WGPME, WGZE, WGITMO. The cooperation with Aquaculture EGs could be further developed.
Linkages to other organizations	UNESCO-IOC Intergovernmental Panel on Harmful Algal Blooms, IOC/SCOR Global HAB (previously GEOHAB - Global Ecology and Oceanography of Harmful Algal Blooms)