

SMR 1550 - 6

WORKSHOP ON THE USE OF RECEPTOR BINDING ASSAY (RBA)

1 - 5 September 2003

Co-organized by the International Atomic Energy Agency (I.A.E.A.)

***IOC OF UNESCO
HARMFUL ALGAL BLOOM PROGRAMME***

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These are preliminary lecture notes, intended only for distribution to participants.



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Why is the IOC interested in harmful algae?



Photo by Dr. Thaitaworn Lirdwitayaprasit
of the Department of Fisheries of Thailand

IOC-WESTPAC HAB R0007

Red tides in the Gulf of Thailand

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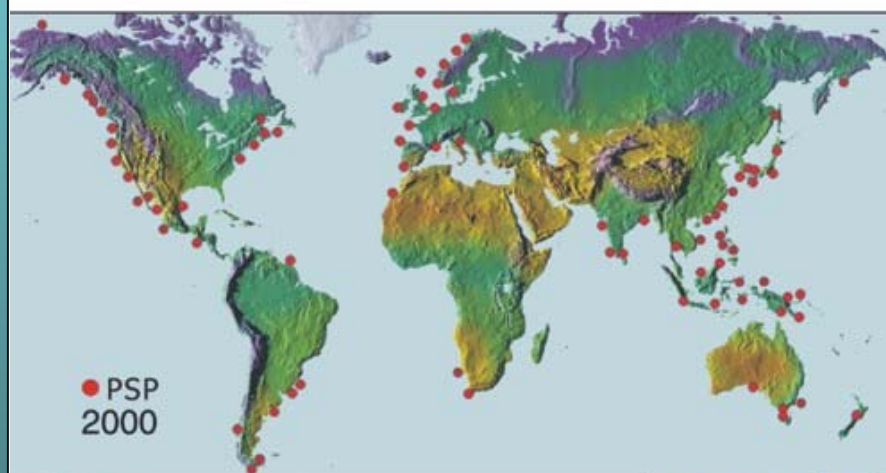
WESTPAC-HAB R0004-2



**Mass mortality of yellowtail, *Seriola quinqueradiata*, cultured in cages
by a red tide of raphidoflagellate *Chattonella antiqua* (Seto Inland Sea, Aug.1977)**

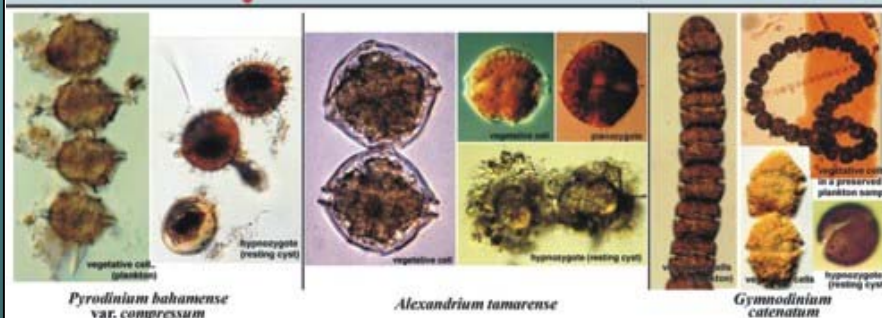


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Paralytic shellfish poisoning (PSP) is a toxin syndrome caused by consumption of seafood contaminated by certain micro-algae.

The two maps show the cumulative global increase in the recorded distribution of the causative organisms and the confirmed appearance of PSP toxins in shellfish at levels above the regulatory limit for human consumption.



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Mega Scale Shrimp Culture Farm (18,000 ponds) in Indonesia

WESTPAC-HAB
IOC Harmful Algal Bloom Programme

R0010



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Potential cooperation with IOC ?

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What is the IOC mandate ?

What is the IOC HAB Programme ?

Strategy

Structure

Activities

Implementation

Potential cooperation with IOC



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INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION OF UNESCO

Who are we ?

***IOC is the only organization in the UN family
charged with oceanographic and marine research.***

IOC is a semi-autonomous body within UNESCO.

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The IOC

Harmful Algal Bloom Programme

To foster the effective management of, and scientific research on, harmful algal blooms in order to understand their causes, predict their occurrences, and mitigate their effects

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The IOC Intergovernmental Panel on Harmful Algal Blooms - IPHAB

- composed of government and organization representatives***
- established to assess progress, decide on priorities, identify funding, and to coordinate with other international and national activities.***

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IPHAB

Chair: Dr. Beatriz Reguera, Spain

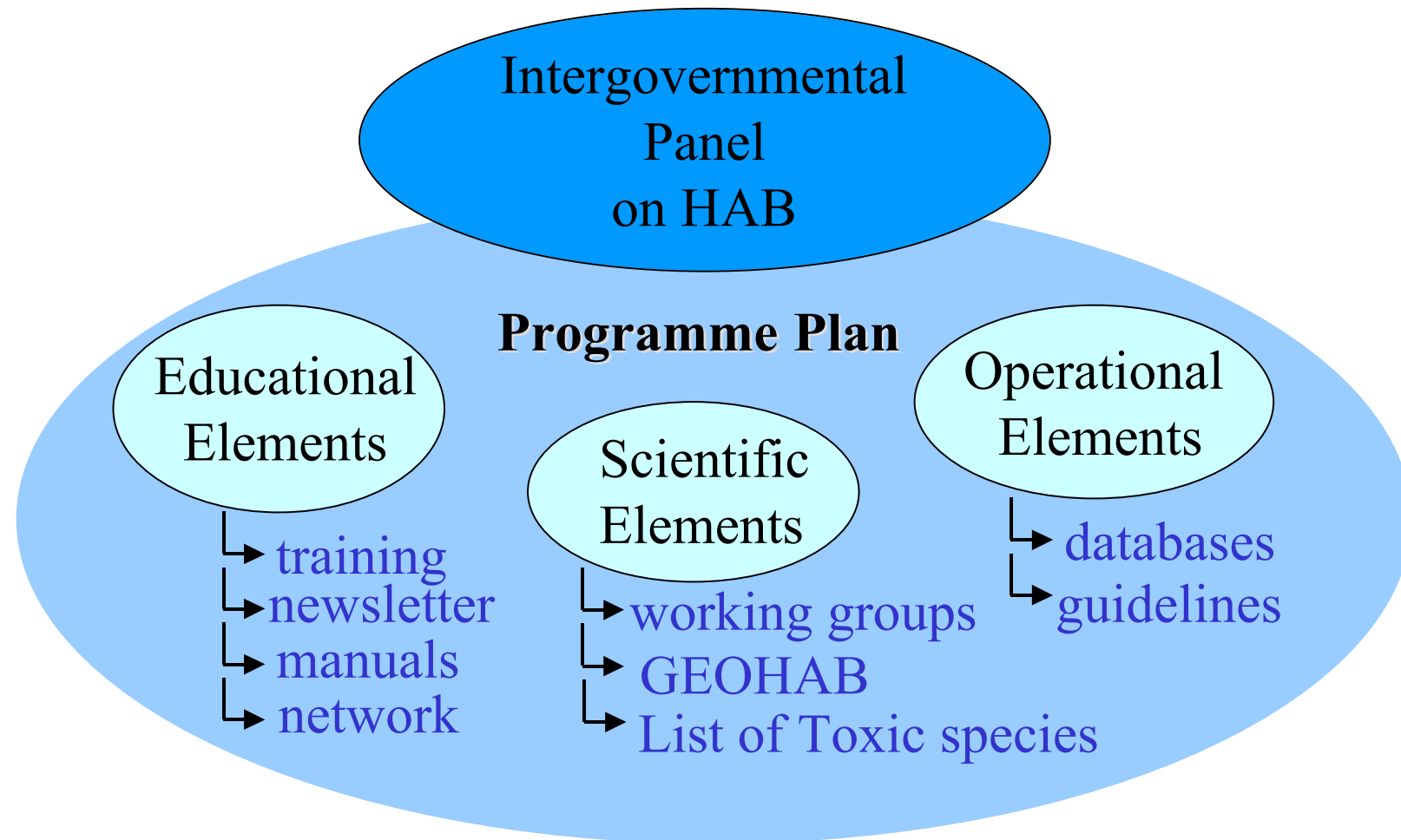
Vice Chair: Dr. Phil Busby, New Zealand

- IOC IPHAB VI Session
St. Petersburg, USA, 17-19 October 2002***

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The Harmful Algal Bloom Programme





Our strategy:

Demand driven short term training courses and an international research programme are combined with and complemented by:

- manuals, guides and species check-lists
- science and communication centres
- cooperative research projects
 - regional networks
 - on-line data-bases
 - E-learning
 - newsletter
- curriculum development

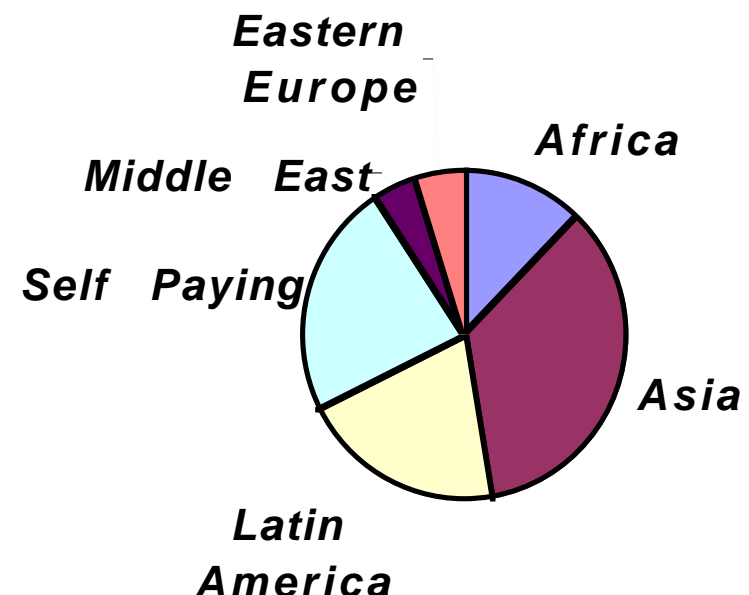


The Harmful Algal Bloom Programme



Capacity enhancement

- *1993-2003: 36 training courses > 500 trainees*
- *Individual training stays*
- *E-learning – UNESCO Cross Cutting*
- *Training through reserach*





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Fifth IOC–Danida Training Course
28 July–6 August 1998



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A key priority is to enhance the capacity to monitor for the occurrence of potentially harmful species and toxicity in coastal waters, lakes, and aquaculture operations

This requires :

- solid taxonomic skills*
- Easy and cost effective methods for toxicity testing/toxin detection*
- competent research groups that can describe new species and deliver identification keys*
- development of new tools to help species identification and toxicity testing*



When establishing HAB monitoring systems, Internet portals and use of E-learning may be useful support tools for:

- capacity enhancement
- inter-calibration exercises
- easy access to agreed protocols and manuals
- dissemination of information within network
- etc

This UNESCO-IOC
publication received support
from:



Danish Natural Science
Research Councils



Danish Ministry of Science,
Technology and Innovation



Royal Danish Ministry
of Foreign Affairs (Danish)

Cover photograph:

The dinoflagellate *Noctiluca scintillans* is the causative organism of this spectacular bloom along the coast of Japan, a classic 'red tide'. Marine microplankton regularly – and with increasing frequency – cause damage to human health, fisheries, aquaculture, marine ecosystems and tourism. Improving the monitoring and management of harmful algae is one component of coastal zone management and a priority of UNESCO's Intergovernmental Oceanographic Commission (IOC) within its Harmful Algal Bloom Programme.

*By courtesy of Susun Asanuma,
Japan.*

► Proliferation of microalgae in marine, brackish or fresh waters can cause massive fish kills, contaminate seafood with toxins and alter ecosystems in ways that humans perceive as harmful. Some 300 species of microalgae are reported to form mass occurrences, or so-called 'blooms', and nearly one-fourth of these species are known to produce toxins. Harmful algal blooms, phytoplankton blooms, microalgal blooms, toxic algae, red tides and harmful algae are all terms for naturally occurring phenomena.

► In a single volume, the Manual on Harmful Marine Microalgae provides guidelines to modern methods of sampling, identification, culturing, toxin analysis, monitoring and management of harmful marine microalgae.

► Prepared by 46 leading scientists under the aegis of the Intergovernmental Oceanographic Commission (IOC) of UNESCO, the Manual on Harmful Marine Microalgae is a comprehensive source book of protocols for studying harmful marine microalgae and a main reference in its field.

► It serves as a useful tool not only for research laboratories and environmental or food safety monitoring authorities, but also for teaching and training purposes.

Manual on Harmful Marine Microalgae

Manual on Harmful Marine Microalgae

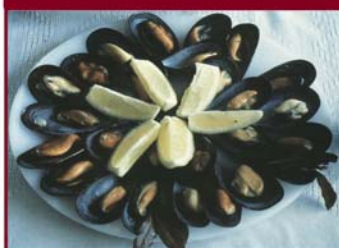
Edited by
G.M. Hallegraeff,
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UNESCO PUBLISHING



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Monitoring and Management Strategies for Harmful Algal Blooms in Coastal Waters

by

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Woods Hole Oceanographic Institution

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National Research Council

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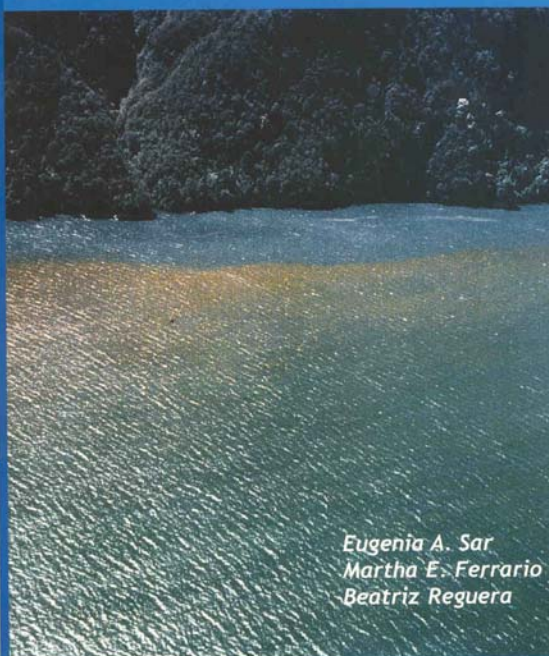
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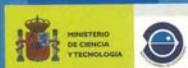
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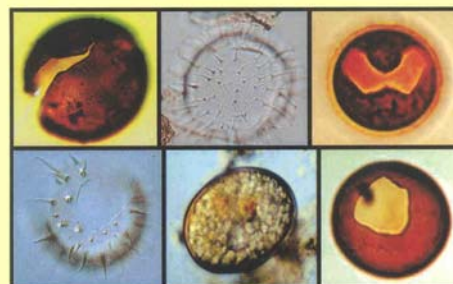
FLORACIONES ALGALES NOCIVAS EN EL CONO SUR AMERICANO



*Eugenia A. Sar
Martha E. Ferrario
Beatriz Reguera*



GUÍA TÉCNICA PARA EL ESTUDIO DE QUISTES DE DINOFLAGELADOS ACTUALES



Kazumi Matsuoka y Yasuwo Fukuyo



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Asian Natural Environmental Science Center, the University of Tokyo

INTERNATIONAL CONFERENCE ON

Harmful
ALGAL
BLOOMS



Ninth Conference
TASMANIA
2000

7-11 February 2000
Hobart, Tasmania, Australia

CONFERENCE PROCEEDINGS

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The Harmful Algal Bloom Programme

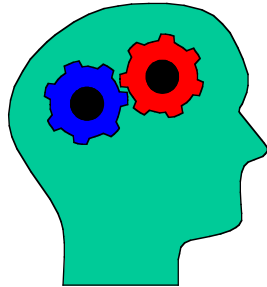


Databases

- International Directory of Experts on HABs (**HAB-DIR**)
- On-line database on HAB events (**HAE-DAT**) with ICES, PICES invited
- On-line database on HAB Monitoring Systems (**MON-DAT**)
- ASFA Bibliographic Database on HABs (**HAB-BIB**)



The Harmful Algal Bloom Programme



Scientific activities

- **ICES-IOC** Working Group on Harmful Algal Bloom Dynamics.
- **ICES- IMO-IOC** Study group on Ballast Waters and Sediments. IPHAB Position Paper on Ballast and HAB
- **IOC-SCOR** International Science Programme Global Ecology and Oceanography of Harmful Algal Blooms (GEOHAB).
- **IOC** REFERENCE LIST OF TOXIC ALGAE on-line.

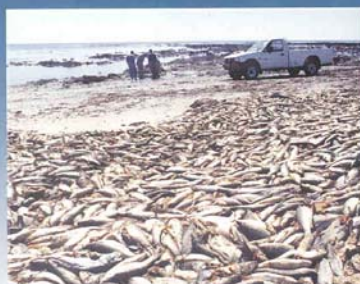


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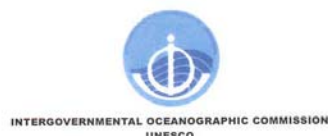


GEOHAB

Global Ecology and Oceanography of
Harmful Algal Blooms

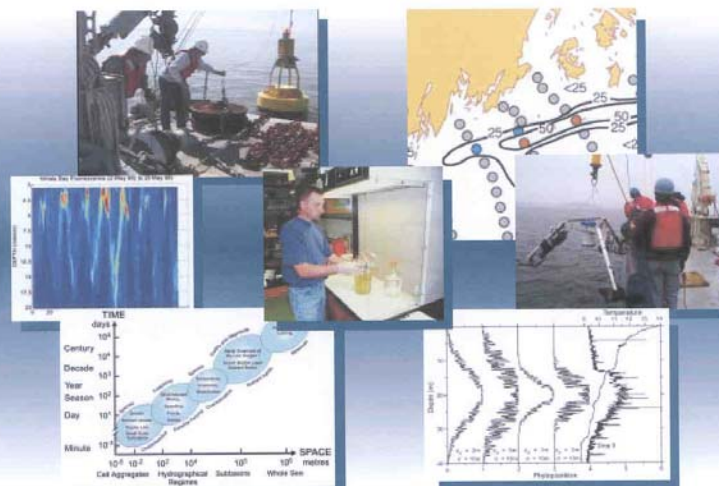


Science Plan



GEOHAB

Global Ecology and Oceanography of
Harmful Algal Blooms



Implementation
Plan



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GEOHAB MISSION:

To foster international cooperative research on HABs
in ecosystem types sharing common features,
comparing the key species involved and the oceanographic processes
that influence their population dynamics

GEOHAB SCIENTIFIC GOAL:

To improve prediction of HABs
by determining the ecological and oceanographic mechanisms
underlying the population dynamics of harmful algae,
integrating biological, chemical and physical studies supported by
enhanced observation and modelling systems.

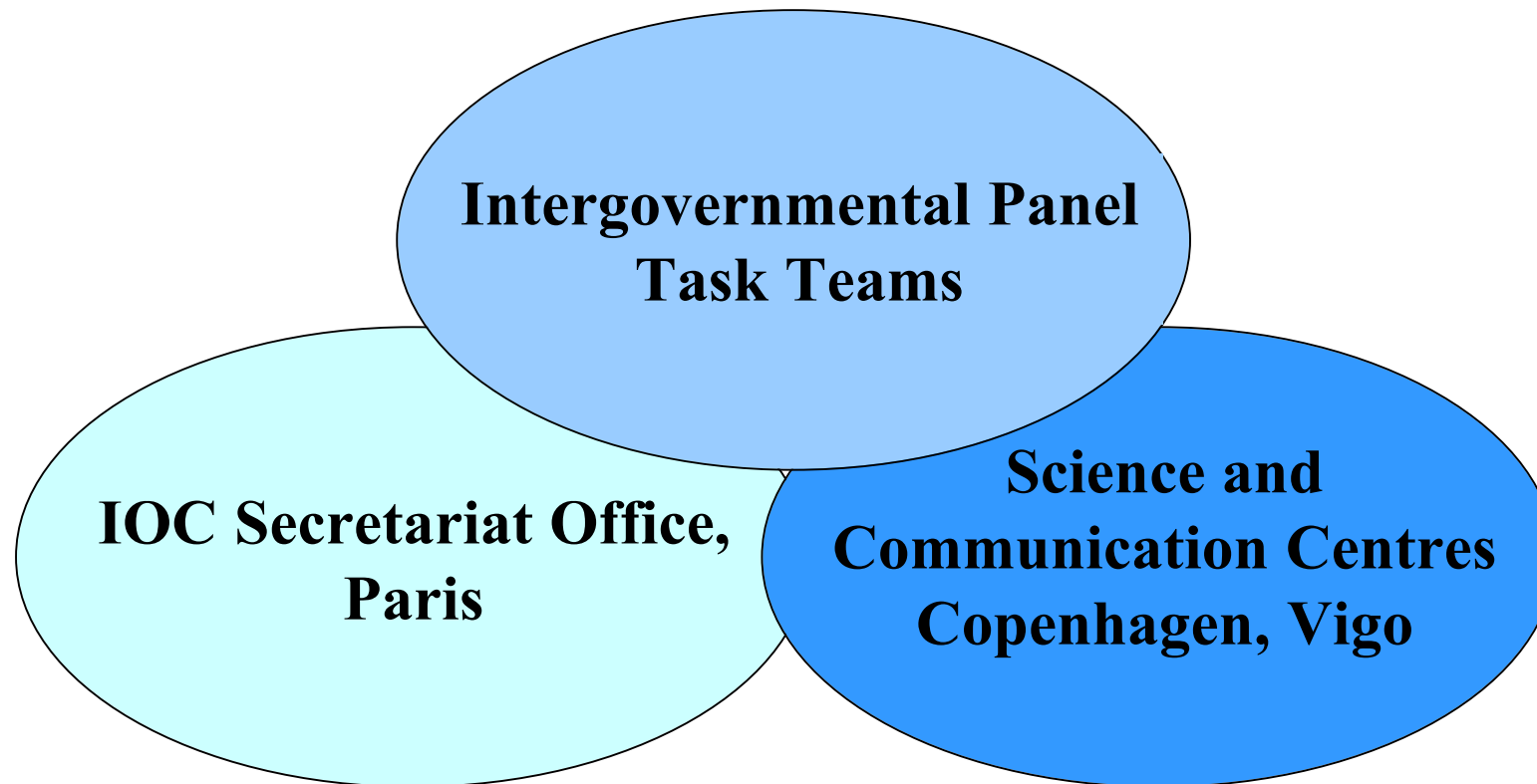
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The Harmful Algal Bloom Programme



IOC Program Coordinator: H. Enevoldsen

HAB Centre staff: J. Larsen, G. Hansen, M. Lion

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Potential cooperation with IOC on:

- training and capacity enhancement
- intercalibration exercises
- portals
- manuals and guides
- We have the network, a context and an international programmatic framework in which capacity enhancement in e.g RBA can be integrated.



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Thank you for your attention



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