

# GEOHAB

Global Ecology and Oceanography of  
Harmful Algal Blooms

**Who is GEOHAB?** You! the scientific community

Scientists are invited to participate in the continuation of GEOHAB by attendance at workshops and open science meetings and by designing research studies in keeping with the goals and objectives of GEOHAB. You can apply for endorsement of your work, online at the GEOHAB web site.



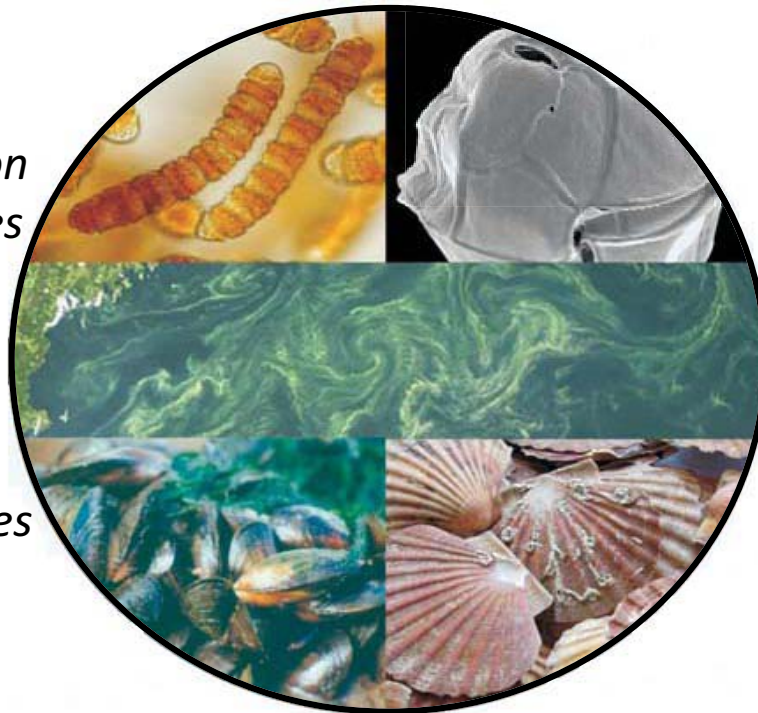
United Nations  
Educational, Scientific and  
Cultural Organization



Intergovernmental  
Oceanographic  
Commission

## The GEOHAB Mission:

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



GEOHAB fosters research that is interdisciplinary, focusing on the important interactions among biological, chemical, and physical processes through support of Core Research Projects, Workshops, Capacity Building, and publications. GEOHAB research is international in scope to encompass the global issues of HAB events.



## Major Themes

### HABs in Benthic Systems

Benthic harmful algae are responsible for the greatest number of non-bacterial illnesses associated with seafood consumption worldwide. GEOHAB has drawn the science community together to focus on pressing problems of BHAB species identification, ecophysiology and toxin transfer through the food web. See <http://gambierdiscuswiki.wikispaces.com/> for taxonomic updates.

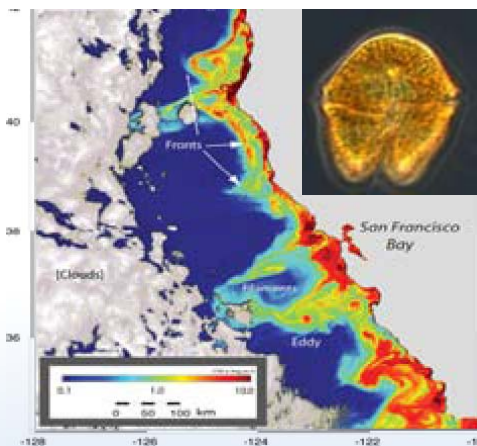


Toxins produced by *Gambierdiscus* (left) bioaccumulate in top predators like barracuda (right) and cause ciguatera fish poisoning.

### HABs in Upwelling Systems

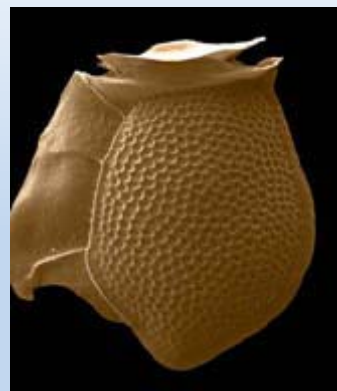
Upwelling systems are characterised by high primary production and greatly enhanced fisheries, but with this comes an increased risk of HAB events.

*Akashiwo sanguinea* bloom off California.



### HABs in Stratified Environments

Stratified environments are very important in the life history of HAB species. Seed populations often develop into high cell densities in very thin sub-surface layers that are extremely difficult to detect.



*Dinophysis* often concentrates in thin layers (© Larson).

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## **GEOHAB – ASIA**

This is a successful regional GEOHAB initiative bringing together a community of scientists to understand the multiple factors that cause blooms and to coordinate HAB research in the region.



Aquaculture, an important industry in Asia, threatened by increasing frequency of HAB events.

## **HABs in Fjords and Coastal Embayments**

Coastal bays and fjords are highly productive regions for fish and shellfish and are used intensively for agriculture. HABs in these regions can have potentially greater economic damage than in other systems.



Sampling for cysts in ship ballast water  
(© O. Casas Monroy).

## HABs in Eutrophic Systems

Increasing pressure on coastal seas has led to many areas becoming eutrophic. Large biomass blooms are particularly prevalent in these regions, driven by nutrient pollution.

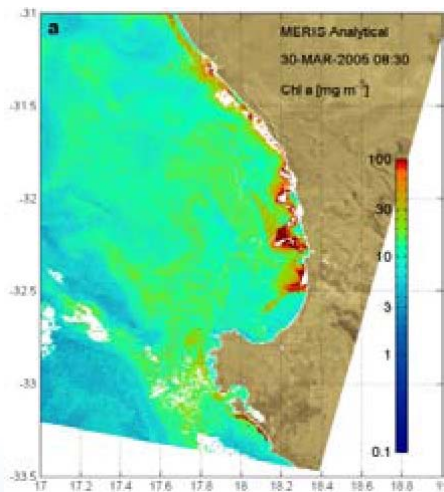
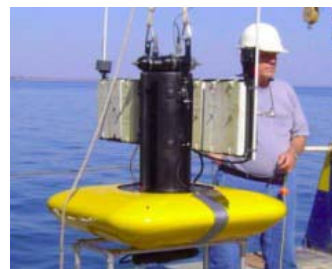


A red tide of *Cochlodinium fulvescens*, a fish-killing genus.

## Observations and Modelling

GEOHAB encouraged the utilization of new *in situ* and remote sensing approaches to foster HAB research.

Deployment of a holographic camera to investigate small-scale physical-biological dynamics.



MERIS image showing a *Prorocentrum triestinum* bloom (*in situ* values reached  $1.2 \times 10^8$  cells  $\cdot$  L $^{-1}$ ).

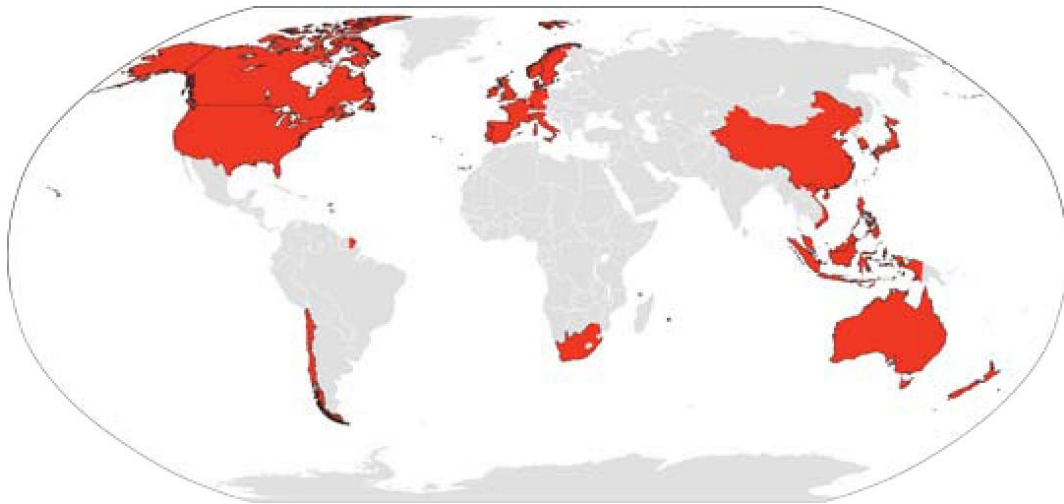
The GEOHAB Modelling initiative brought together experienced and new modellers worldwide to incorporate modelling into HAB research and management.

The International Ocean Colour Coordinating Group (IOCCG) is partnering with GEOHAB to review applications of ocean colour for HAB research.



# A decade of international leadership in Harmful Algal Bloom research

*GEOHAB has endorsed more 35 projects in 20 countries*



## Attend the Open Science Meeting!

### Paris 24-26 April 2013

GEOHAB's final Open Science Meeting will be held in conjunction with IPHAB XIV. The goal of the meeting is to highlight GEOHAB accomplishments and plan for the next phase of international HAB research:

- Core Research Projects
- GEOHAB Asia
- Modelling & Observational Networks
- Coordination with other groups
- The future of HAB research
- Capacity Building and Outreach

For further information see our web site or contact

[www.geohab.info](http://www.geohab.info)

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