



# Monitoring & Alert HAB Program

Implementing a statewide HAB network and forecasting system for California, expandable to the U.S. West Coast.

## How tiny algae "bloom" to become harmful

Algal blooms occur when environmental conditions promote the rapid growth of large numbers of single celled algae, either microscopic or macroscopic phytoplankton. Harmful Algal Blooms (HABs) occur when the dominant species in the bloom has a harmful trait.

The vast majority of algae are harmless, and indeed perform an essential role as the primary producers in many aquatic systems.



*Akashiwo sanguinea*  
Implicated in seabird mortality (photo below)

Some harmful species produce toxins, which can affect health and coastal economies and cause marine wildlife mortalities. Some species cause large fish kills by clogging or lacerating gills; these species generally are also harmful to crustaceans. Still others negatively impact the system indirectly by using up all the oxygen (causing other aquatic plants and animals to suffocate), or by blocking sunlight and preventing aquatic plants from accessing it.

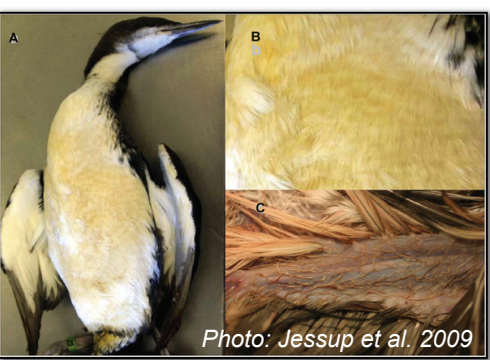


Photo: Jessup et al. 2009

## What is Cal-HABMAP?

The **California Harmful Algal Bloom Monitoring & Alert Program**

(Cal-HABMAP) was founded in 2009, based on consensus at the state and local levels that a **coordinated response network** is necessary for efficient **HAB mitigation, prediction and prevention.**

The goal of Cal-HABMAP is to implement a proactive HAB alert network that will provide **algal bloom forecasts** and facilitate **information exchange** among HAB researchers, managers and the general public. Crucial decisions on **how to respond** to HAB events, how to **mitigate** their impacts, how to **predict** them, and potentially how to **prevent** them require knowledge of their occurrence and impacts.

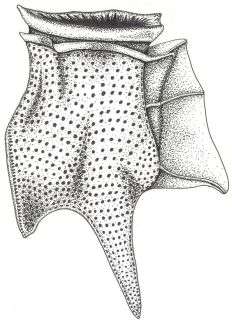
**Cal-HABMAP is designed to develop and communicate that knowledge.**

### Goals of Cal-HABMAP:

- Design a HAB network **that will meet the needs of, and be accessible to, all HAB stakeholders.**
- Create a centralized web location **where all HAB data and predictive information can be visualized and accessed by all HAB stakeholder groups throughout the state.**
- Conduct an economic analysis **to determine the potential impacts of HABs to California coastal economies. Recently, EPA estimated the impact of HABs on the US economy to be over \$40 million each year.**
- Conduct a comparison of analytical methods **for toxin analysis and harmful algae identification and enumeration, in order to combine and compare datasets collected throughout California.**
- Collaborate with the Water Quality Monitoring Council **to ensure that HAB information and data is included in and accessible from water quality websites.**

If you would like to be added to the Cal-HABMAP listserve, contact Meredith Howard at the Southern California Coastal Water Research Project: [mhoward@sccwrp.org](mailto:mhoward@sccwrp.org).

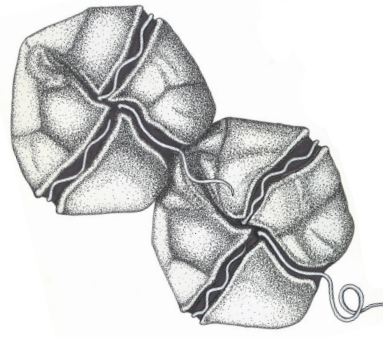
The number of HAB events is increasing worldwide, as is our recognition of marine toxins and toxin-producing algal species.



**Left:** *Dinophysis* spp. Some species of *Dinophysis* produce okadaic acid and dinophysistoxins.

**Right:** *Alexandrium* spp. Several *Alexandrium* species can produce toxins, including saxitoxins.

Illustrations by Corlis Baranyk



## First Steps of Implementation

HAB researchers committed to Cal-HABMAP have begun taking some initial steps to create a HABMAP network. A **HAB listserv** has been generated that currently has over 100 subscribers from a variety of sectors, including federal agencies, ocean observing systems, commercial shellfish industries, public health, wildlife rescue, management and HAB research. The listserv is a way to rapidly communicate information during HAB events to all HAB stakeholders. The listserv has recently been expanded to include participants from Oregon and Washington with the goal of expanding the network in the future to include all three U.S. west coast states.

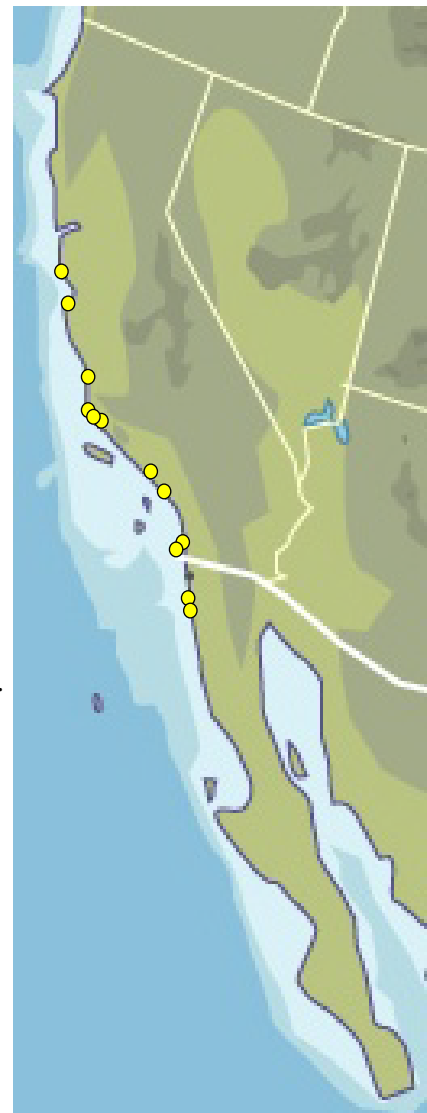
The Cal-HABMAP group initiated a **national workshop**, sponsored by the Alliance for Coastal Technologies (ACT), the Cooperative Institute for Coastal and Estuarine Environmental Technology (CICEET) and the Florida Fish and Wildlife Conservation Commission, on analytical methods comparison for toxin detection and species identification that occurred in October 2008. The outcome of that workshop is a national comparison of methodologies that will be conducted by four regional groups, including the U.S. West coast.

### Near real-time reporting sites

The **map at right** shows near real-time reporting locations in California and Mexico.

Weekly updates from these locations are circulated through the HABMAP listserv.

Santa Cruz Municipal Wharf, **Santa Cruz**  
Monterey Wharf, **Monterey**  
Stern's Wharf, **Santa Barbara**  
Goleta Pier, **Goleta**  
Gaviota Pier, **Gaviota**  
Cal Poly Pier, **San Luis Obispo**  
Santa Monica Pier, **Santa Monica**  
Newport Pier, **Newport**  
Scripps Pier, **La Jolla**  
Coronado Islands, Baja, **Mexico**  
Salsipuedes Bay, Baja, **Mexico**  
Todos Santos Bay, Baja, **Mexico**



### Links for more HAB information

**These contain information about HAB research, monitoring efforts, and educational tools.**

<http://www.cencoos.org/sections/news/HABMAP.shtml>

<http://www.sccoos.org/data/habs/index.php>

<http://www.cdph.ca.gov/HealthInfo/environhealth/water/Pages/PhytoplanktonMonitoringProgram.aspx>

<http://www.noaawatch.gov/themes/habs.php>

<http://www.whoi.edu/redtide/page.do?pid=9257>

[http://cimt.ucsc.edu/factsheets/2HaB\\_Factsheet.pdf](http://cimt.ucsc.edu/factsheets/2HaB_Factsheet.pdf)

**To read about how our monitoring and research has provided benefit to a local business, visit:**

[http://cimt.ucsc.edu/factsheets/Abalone\\_success.pdf](http://cimt.ucsc.edu/factsheets/Abalone_success.pdf)