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S.C. TASK GROUP ON HARMFUL ALGAE

S.C. Sea Grant Consortium

Communications
Extension Program

S.C. Department of Health and Environmental Control

Bureau of Water
Bureau of Preventive Health Services
Ocean and Coastal Resource Management
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Marine Resources Division

NOAA/NOS/Charleston Laboratory

Clemson University

Medical University of South Carolina

Marine Biomedical Program
School of Medicine

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NOAA Grant Awarded for Research, Education, and Outreach

The South Carolina Task Group on Harmful Algae is engaged in another season of studying Harmful Algal Blooms (HABs). Aided by a new grant from the National Ocean Service (NOS), a division of the National Oceanic and Atmospheric Administration (NOAA) titled, "A proposed harmful algal bloom initiative for South Carolina." The task group will continue to assess the potential environmental impacts of red tides, *Pfiesteria*, and toxic algae.

The task group has established the following five objectives toward HAB assessment:

- determine the present distribution of harmful algae in S.C. estuaries;
- determine the environmental factors that favor HAB formation in S.C. estuaries so that future effects on ecosystem and human health can be predicted;
- establish a statewide surveillance system for HAB detection and response;
- expand current communication and education efforts related to HABs, and implement new efforts to increase awareness of the HAB issue among resource managers, community officials, coastal users, and the general public; and
- ensure the continued operation of the S.C. Task Group on Harmful Algae.

Working together on the project are representatives from the S.C. Sea Grant Consortium, S.C. Department of Natural Resources, University of South Carolina Belle W. Baruch Institute, Department of Health and Environmental Control, and NOAA's National Ocean Service. Project participants will continue to assess the present status of HABs in South Carolina and establish a statewide monitoring and rapid-response system to determine the present and future impact on natural resources and human health.

“The research philosophy of this project is to focus on the ecology of South Carolina HABs, not just where they are but why they’re occurring. . . Over time, we hope to understand whether human activities are contributing to the problem.”

*Alan Lewitus
Associate Marine Scientist
SCDNR/USC*

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"This grant allows us to be more proactive in dealing with HAB issues," says Rick DeVoe, chair of the S.C. Task Group on Harmful Algae and executive director of the S.C. Sea Grant Consortium. "It's a great opportunity for state agencies and universities to utilize talents and resources collaboratively."

Research on HABs is becoming increasingly important. The number of HAB "events" along the U.S. coast has been steadily rising, from 200 in the decade of the '70s to 700 in the '90s. The effects of these HABs, including fish kills, public health problems, and loss of tourism dollars, have cost the United States an estimated \$300 million since 1991. HAB research, education, and outreach are especially necessary for South Carolina, a state that is experiencing an explosion in coastal development. One of the negative effects of increased development is excess nutrients from rainwater drainage systems, sewage treatment plants, and agriculture fertilizers that pour into coastal waters. While HABs are a

naturally occurring phenomenon, this surge in development and excess nutrients could cause conditions that are favorable to new, potentially harmful, algal blooms. "The research philosophy of this project is to focus on the ecology of South Carolina HABs, not just where they are but why they're occurring," says Alan Lewitus, associate marine scientist with S.C. Department of Natural Resources and the University of South Carolina. "Over time, we hope to understand whether human activities are contributing to the problem, particularly with regard to nutrient loading."

Information on the distribution and ecology of HABs is vital to coastal zone managers. Local leaders involved in development issues need to be educated about the relationship between coastal growth and potential HABs. The education and outreach aspects provided for in this grant should improve the understanding of HABs for present and future South Carolina researchers, teachers, resource managers, and community officials.

Students to Monitor Algae

The S.C. Task Group on Harmful Algae is pleased to announce the establishment of the first South Carolina Phytoplankton Monitoring Network (SCPMN), fulfilling part of the objectives of the recently awarded NOAA grant, "A proposed harmful algal bloom initiative for South Carolina." Ultimately slated as a statewide surveillance system for early HAB detection and response, the monitoring network is led by algae taxonomist Steve Morton and Kate Schaefer, project coordinator. Both Morton and Schaefer are with the Marine Biotoxin Program at the NOAA/NOS Center for Coastal Environmental Health and Biomolecular Research (CCEHBR).

The initial network comprises secondary marine biology teachers and students, who will use a SCI-LINK/GLOBE-NET publication titled "Algae: A Sourcebook for Teaching about Harmful Algal Blooms" as a guide. Morton was the project leader for the monitoring program in Maine that detected the toxic dinoflagellate *Alexandrium* two weeks before the toxin was found in local shellfish. The S.C. Phytoplankton Monitoring Network is modeled after Maine's successful program.

"The Phytoplankton Monitoring Network unites students with scientists who study harmful algae," says Morton. "The discoveries of this network may open up additional avenues of research by finding new bloom organisms, which will direct other research projects."

The SCPMN members will collect data on phytoplankton distribution and abundance in South Carolina, and also will allow researchers to begin developing an algal species

South Carolina Task Group on Harmful Algae

The S.C. Task Group on Harmful Algae publishes this newsletter three times a year to share knowledge about harmful algae and communicate activities of the task group. Interested constituents include elected and appointed officials, natural resource managers, public health organizations, and the general public. Comments regarding this or future issues are welcomed. Subscriptions are free upon request.

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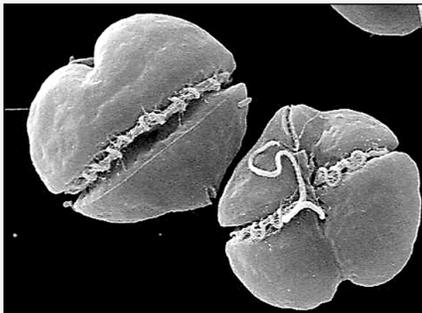
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list for the state. The monitoring network will complement other surveillance components such as the sampling of potential “hot spots” (characterized by red tides or lesioned fish) and monthly statewide samplings.

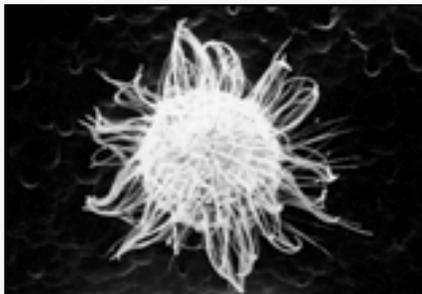
Participating schools will be given classroom and on-site training by NOAA/NOS/CCEHBR Marine Biotoxins Program staff to help the students identify more common algal species, including algae known to be harmful. Each group will collect phytoplankton samples at



Gambierdiscus toxicus: Toxic dinoflagellate associated with ciguatera fish poisoning.



Karina brevis: Toxic dinoflagellate which causes red tides.



Pfiesteria piscicida: Toxic dinoflagellate associated with fish kills, fish disease, and public health problems.

least once or twice a week from several different sites using plankton nets. The students will then identify the algae found and relay this information to NOAA/NOS/CCEHBR. If an unknown species is found in abundance, the sample will be sent to the Marine Biotoxins lab for further analysis. Back in the classroom, students will learn about algal blooms and observe the samples they have collected.

Morton and Schaefer are currently working with three high schools in Charleston County: Academic Magnet, Berkeley, and Sea Pines Academy. The goal is to grow the program by the end of the year into 30 participating schools throughout South Carolina.

A newsletter and a Web site are being developed specifically for the monitoring network. The Web site will synthesize data collected by various groups around the state and will contain details about the monitoring program. Web site content includes a history of phytoplankton monitoring networks; goals of the SCPMN; information about harmful algae; S.C. curriculum requirements that are met through participation in the network; a phytoplankton species list; a summary of current monitoring activities; and contact information. Soon, each group will be able to submit data electronically to the Web site and the information will be displayed using a Geographic Information Systems (GIS) database.

For more information about the monitoring network, visit <http://www.chbr.noaa.gov/CoastalResearch/SCPMN/SCPMNmain.htm>.

Citizens Helping Scientists

The concept of volunteer monitoring networks has been catching on.

1991: The first volunteer phytoplankton monitoring network was started in California by the California Department of Health Services (CDHS) in response to the 1991 seabird, cormorant, and brown pelican mortality event caused by the toxic diatom *Pseudonitzschia*.

1996: The Maine Department of Marine Resources (DMR) used the water quality volunteer group as the backbone for the start of its phytoplankton monitoring network. Volunteer groups based in Eastport, Maine, were able to detect the toxic dinoflagellate *Alexandrium* two weeks before DMR detected toxin in the local shellfish. Based on the success of the Maine groups, monitoring networks have been initiated in Delaware, New Hampshire, New Jersey, and Massachusetts.

2000: NOAA/NOS grant awarded to the S.C. Task Group on Harmful Algae to support, among other activities, the development of the South Carolina Phytoplankton Monitoring Network.

Information and Resources

Web sites

Harmful Algal Blooms

The National Office for Marine Biotoxins and Harmful Algal Blooms at Woods Hole Oceanographic Institution: <http://www.redtide.whoi.edu/hab>

NOAA's Marine Biotoxins Program

<http://www.chbr.noaa.gov/CoastalResearch/WhoIs.htm>

Sea Web Ocean Citations

Selected science publications on ocean issues, category "Algal Blooms and Marine Biotoxins": <http://www.seaweb.org/background/abstracts>

General

NOAA's National Ocean Service

Sustainable Seas Expedition, State of the Coast Report, NOS MapFinder Service: <http://www.spo.nos.noaa.gov>

United Nations Educational, Scientific, and Cultural Organization

<http://www.unesco.org>

Publications

Harmful Algae News. The Intergovernmental Oceanographic Commission (IOC) newsletter on toxic algae and algal blooms, Tim Wyatt, Editor: <http://www.ioc.unesco.org/hab/news.htm>

Journal of Phycology. Dr. Patricia Wheeler, Editor: <http://www.blackwellscience.com/journals/phyecology>

Harmful Algae. Sandra Shumway and Theodore Smayda, Editors-in-Chief: <http://www.elsevier.com/locate/hal>
Scheduled to be published in early 2002.

Other

International Directory of Experts in Harmful Algae, an IOC publication: <http://ioc.unesco.org/hab/data.htm>

Algae-L Listserve, Mike Guiry, Moderator: <http://www.seaweed.ie>

Coming Soon: S.C. Task Group on Harmful Algae Web Site

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