

State task group studies *Pfiesteria*

In recent years, the toxic organism *Pfiesteria piscicida* has been linked to fish kills and lesions and human health impacts in several coastal rivers in some mid-Atlantic states. In 1991,

The toxic organism *Pfiesteria piscicida* has not been linked to any known seafood poisonings. *Pfiesteria* was implicated in numerous fish kills in North Carolina. In 1995, officials closed a section of the lower Neuse River after fish kills involving millions of menhaden (a commercially important fish in the herring family). And in 1997, officials closed sections of three rivers that flow into the Chesapeake Bay after similar fish kills and human health effects.

Researchers at the University of Maryland and Johns Hopkins University issued a preliminary report noting that people heavily exposed to *Pfiesteria*-infested waters in rivers draining into Chesapeake Bay suffered skin disorders, respiratory irritation, learning disorders, memory loss and confusion.

Although publicity about *Pfiesteria* has been widespread, there have been a number of misconceptions about this microscopic organism.

Pfiesteria and other toxic dinoflagellates have been discovered in South Carolina estuarine waters, but scientists were not surprised to find it here. *Pfiesteria* is an ancient life form that has probably existed in South Carolina waters for millions of

years. Nevertheless, there have been no known fish kills or human health effects in South Carolina due to *Pfiesteria*, which seems to favor shallow, poorly flushed, brackish waters. *Pfiesteria* has not been found in the open ocean or near beaches or in lakes. The organism is a dinoflagellate protozoan, not a bacterium. *Pfiesteria* causes problems

only during blooms when massive numbers of these algae are present. Blooms are probably stimulated by large increases of nutrients in coastal waters. Finally, *Pfiesteria* has not been linked to any known seafood poisonings.

After outbreaks of *Pfiesteria* in mid-Atlantic states last fall, a South Carolina Task Group on Toxic Algae

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Some toxic algae cause thousands of seafood poisonings worldwide

One evening in 1990, eight fishermen in a boat on Georges Bank, 100 miles east of Cape Cod, sat down to a meal of steamed mussels that they'd incidentally caught in their nets. Sometime during the meal, the boat captain, who had come into the galley late, suddenly noticed that his men were behaving strangely. They had been poisoned by a toxin in the shellfish, causing neurological symptoms including numbness, incoherent speech, and respiratory paralysis.

Although the captain had eaten fewer mussels than his men, he also fell ill. Yet he managed to send an emergency radio message to the U.S. Coast Guard, which airlifted the fishermen to the hospital on Nantucket Island. The

fishermen were treated with respiratory therapy to maintain their breathing and prevent suffocation from lung paralysis. All recovered, and within a few weeks they were back fishing.

The poisoning was apparently caused by a huge bloom of the toxic alga *Alexandrium* in Georges Bank, which was later closed to shellfish harvesting.

This incident is just one example of thousands of annual poisonings by toxic algae in seafood worldwide. Such poisonings are apparently increasing along with interstate and international shipping of seafood. International travel has exploded as well, with greater numbers eating seafood in exotic places.

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was organized. Scientists, physicians, state and federal resource officials, communications staff and extension personnel began discussing methods of establishing state-wide monitoring of both estuarine waters and people

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working in these areas. The task group is also developing a coordinated state strategy to cope with the possible consequences of a *Pfiesteria* bloom in South Carolina

waters if it should occur here.

Partners in the task group include the S.C. Sea Grant Consortium, S.C. Department of Health and Environmental Control, University of South Carolina, S.C. Department of Natural Resources, National Oceanic and Atmospheric Administration Charleston Laboratory, Clemson University, Medical University of South Carolina, and Charleston VA Medical Center. Scientists and physicians at some of these institutions are now engaged in *Pfiesteria* research.

South Carolina is among just a few U.S. states that have not experienced major toxic blooms.

Recently, the group proposed the development of a Harmful Algae Bloom Framework for South Carolina. The goals of the framework are to review existing information on toxic algae, monitor estuarine waters, continue research on toxic algae, provide economic analysis of potential impacts, and establish methods of public education and outreach.

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Of 4,400 marine algae species, only 50 to 60 are toxic, but scientists continue to find new harmful species. In recent years, aquaculture in marine environments has increased dramatically, along with increased monitoring of cultured seafood and coastal waters. This closer monitoring has revealed toxic algae that probably always existed, experts say.

Nonetheless, the intensity and distribution of toxic algal blooms seem to be growing worldwide, perhaps partly due to excess nutrients in coastal waters from agriculture, aquaculture, stormwater runoff, atmospheric pollutants, water-treatment plants and other sources. Toxic blooms, moreover, have affected fish and shellfish in nearly every U.S. coastal state. South Carolina is among just a few U.S. states

without toxic algal blooms affecting human health or seafood.

Since 1978, illnesses in the United States due to natural algal toxins include paralytic shellfish poisoning, neurotoxic shellfish poisoning, ciguatera fish poisoning, and amnesic shellfish poisoning. Gastrointestinal disorders, respiratory difficulty, memory loss, and, in rare cases, death can be caused by consumption of shellfish or fish contaminated by toxic algae. It should be noted, however, that the toxic microbe *Pfiesteria piscicida*, which has received extensive publicity in recent years, has not been linked to any seafood poisonings. In addition, government monitoring of coastal waters for toxic algae has dramatically reduced the risk of consuming shellfish tainted by toxic algae, experts say.

Web sites on *Pfiesteria*:

S.C. Department of Environmental Control:
<www.state.sc.us/dhec/fspfies.htm>

Woods Hole Oceanographic Institution:
<www.redtide.whoi.edu/hab/>

University System of Maryland:
<www.mdsg.umd.edu/fish-health/pfiesteria>