

FACT SHEET

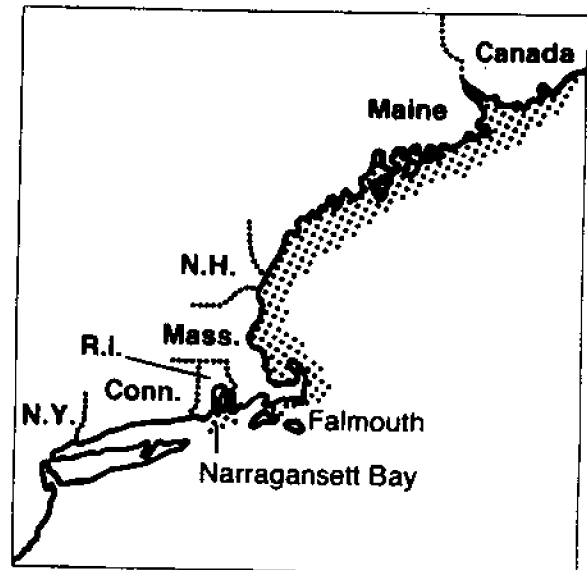
University of Rhode Island
Marine Advisory Service / NOAA Sea Grant

RED TIDE P814

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Red tides are naturally occurring population explosions of reddish-brown phytoplankton, a microscopic algae, in warm, shallow salt waters. Most of them are harmless, but some species of phytoplankton are poisonous to man. Shellfish that feed on poisonous species can accumulate high concentrations of toxin. If people eat these particular shellfish, they can be afflicted with paralytic shellfish poisoning.

Red tides are not new; they are mentioned in the Bible. They occur on both sides of the Atlantic, off Florida, and along the Pacific coast into Alaska. New Englanders first became aware of toxic red tide in 1972, when population blooms of toxic phytoplankton appeared from Maine to Cape Cod. Approximately 30 cases of illness were reported, with no fatalities. An official ban on shellfish in those areas and the resulting publicity frightened the public, and they not only stopped eating all shellfish, but shunned perfectly safe seafoods as well.

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An extensive public health system protects most Americans from eating shellfish contaminated by red tide toxin. However, recreational boaters cruising from southern New England to Canada may be unknowingly exposed to paralytic shellfish poisoning. "Picking up a bucket of clams for a chowder" is a tradition of cruising people, and they frequently dig clams or mussels in remote coves or on ledges where there is no posting. They may not be aware that a local shellfish bed is closed because of red tide.

CAUSES OF RED TIDE

More than 60 different species of phytoplankton cause red tides; of these only four or five have been identified as toxic. Gonyaulax tamarensis and excavata, the sources of New England's toxic tides, are microscopic one-celled phytoplankton which propel through the water by two tiny whip-like extensions called flagella. The life cycle includes a dormant cyst stage which can survive cold winters in bottom sediments. These cysts are easily transported by tidal currents, dredge material disposal, and transplanted shellfish. The cysts which also contain toxin, are the seeds for annually recurring population explosions, called blooms.

HOW SHELLFISH ARE INFECTED

Clams, quahogs, scallops, mussels, oysters and other bivalves survive by "filter-feeding" or siphoning in water containing phytoplankton, including Gonyaulax organisms. A large oyster can filter up to seven gallons of plankton-bearing water an hour, and a clam, half that amount. This means that during a red tide bloom, one shellfish stomach could accumulate billions of Gonyaulax organisms in 24 hours. Exposed shellfish are dangerous because we eat them "stomach and all."

Finfish, lobsters, crabs and other swimming seafood eaten without stomachs are safe when fresh, even if caught in red tide waters. Even before or after red tide occurs, shellfish in the area may not be safe. It takes several weeks of flushing with clean water to purge the shellfish and make them safe to eat.

PARALYTIC SHELLFISH POISONING (PSP)

Enough toxin can accumulate in the stomachs of just three clams to make anyone who eats them very ill. The toxin attacks the human nervous system within 30 minutes with symptoms which might include numbness of the lips, tingling of the extremities, uncoordinated movements, incoherent speech, a feeling of lightheadedness and nausea. PSP symptoms may be mistaken for drunkenness. Eventual paralysis of the breathing mechanism may result. No known antidote exists for the toxin. First aid should focus on getting medical attention and alleviating the symptoms of gastrointestinal and respiratory distress. It usually takes 12 hours for PSP to reach its peak, but leaves no apparent effects once the crisis is past. It is an unpleasant and potentially dangerous illness, though rarely fatal in the United States.

WHERE AND WHEN RED TIDES OCCUR

Many types of microscopic algae, most of them harmless, mass together or bloom on a regular basis annually, usually in the spring, late summer or fall. But red tide can occur any time during the boating season if weather conditions are right. Dry sunny spells following a sudden storm can encourage Gonyaulax to multiply rapidly. When billions of organisms are present, they may tint the water. A red tide may suddenly appear in localized patches or longshore streamers. A few days or weeks later, the red color mysteriously disappears. However, it should be noted that water discoloration does not necessarily accompany--and therefore indicate--the presence of phytoplankton blooms. This has been especially true in the Gulf of Maine and off Canada. Many types of marine life are luminescent and can glow in the dark. Some red tide organisms emit a bluish-green bioluminescent light which can make the waves glow at night. People swimming at night may glow also.

The map shows the areas of New England's coast which have red tide potential, or where red tide has occurred. Be alert in those areas. Some scientists predict that the red tides could eventually move westward into the waters of Rhode Island and Long Island Sounds.

KNOW WHEN SHELLFISH ARE SAFE

Many monitoring stations along New England's coasts constantly check on shellfish safety. There is a strictly enforced public health mechanism which prevents shellfish from reaching the market if any toxicity is discovered. When red tides are present, notices are posted near the infected beds and in the local press. Shellfish wardens patrol the closed areas.

When cruising in unfamiliar waters, ask about red tide before gathering shellfish. They may not be safe to eat even though the water looks clear. In the Gulf of Maine and Canada, boaters should assume that all mussels are contaminated and other shellfish suspect during June, July and August. Cooking will kill bacteria but WILL NOT destroy the toxin that cause PSP.

Boaters should also be warned that, east of Rhode Island, strictly enforced local shellfish ordinances govern who gets permits and where they may dig. Many cruising boaters digging a bucket of clams have been caught and fined by zealous shellfish wardens in the northeast.

When in doubt, or when reliable red tide information is not available, don't dig. Buy your shellfish from retail markets, catch finfish, or have a shore dinner in a restaurant.

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