# North Carolina
# National Estuarine Research Reserve

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# Closed to Shellfishing

Traveling the shorelines of North Carolina you may have seen a small sign with the words "Closed Area." This mean that the shellfish beds in that area are closed to harvesting. But why?

Shellfish are bivalves, or two-shelled, mollusks and include clams, oysters and mussels. Shellfish live in the estuaries of the coastal United States. Several different species of oysters and clams inhabit the coastal zone. All have similar life histories and perform similar functions in the estuarine system. Adults spawn into open waters, the larvae float with the currents for a time and then settle onto the bottom. If the habitat onto which they settle is suitable, they survive and grow. Oysters attach to hard substrates, while clams burrow into the sediment. Shellfish feed by ingesting the surrounding water and pumping it through their bodies to filter out the microscopic plants, or phytoplankton, as food. Along with the phytoplankton, shellfish take in other particles suspended in the water. Shellfish can filter tens of gallons of water per hour at peak feeding times, so they can easily pick up whatever substances are in their surrounding water, including harmful bacteria and viruses. This is the key to understanding those signs.


Many people eat shellfish, mostly oysters, raw, right out of the shell. So anyone eating them is consuming everything in that shellfish. That is where problems can occur. In 1924, there were typhoid fever outbreaks in New York, Chicago and Washington, D.C. Analysis by public health officials showed the illnesses were associated with consumption of raw oysters contaminated from sewage in the waters where the oysters had been harvested. In response to these outbreaks and requests from state public health officials, the U.S. Food and Drug Administration established the National Shellfish Sanitation Program (NSSP).

The North Carolina National Estuarine Research Reserve is a cooperative program between the North Carolina Department of Environment and Natural Resources, Division of Coastal Management and the National Oceanic and Atmospheric Administration.

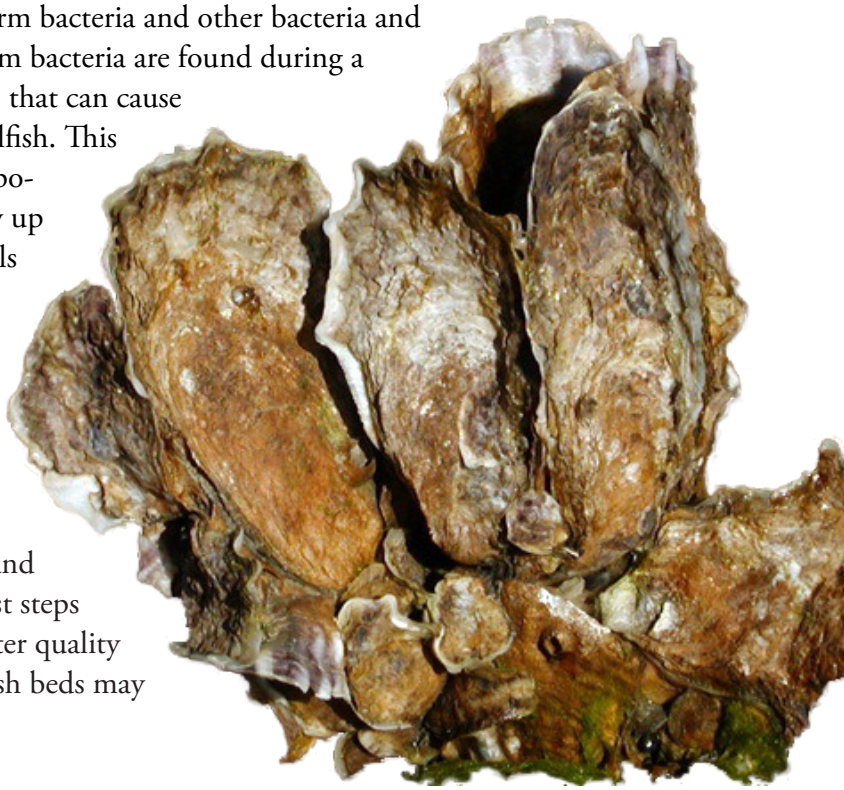
Under the NSSP, coastal states established measures to ensure safe shellfish for consumers. Sanitation controls and testing procedures were put in place to decrease public health risks associated with the consumption of raw shellfish. This included requirements for the harvesting, processing and handling of shellfish.

Since establishment of the NSSP, control measures have been refined and now there is proper classification of coastal waters for harvesting. The shellfishing industry has come under appropriate regulation to protect public health. Research shows that several viruses and bacteria found in shellfish may lead to human illness. The shellfish themselves are generally not affected. Identification of every specific disease-causing organism in a given sample is time consuming and expensive. Instead, state programs use "indicator" bacteria that are easy and cheap to find and identify as an indicator that harmful pathogens are likely present. The most common indicator species is fecal coliform bacteria. These bacteria are harmless and occur normally in the intestines of warm-blooded organisms, including humans. When fecal coliform bacteria are excreted they can enter shellfish waters from sewage system malfunctions, stormwater runoff and other sources along the shoreline.

As they filter feed, shellfish ingest fecal coliform bacteria and other bacteria and viruses in the water. If high levels of fecal coliform bacteria are found during a survey, regulators know that potential pathogens that can cause serious illness are also most likely present in shellfish. This prompts the decision to close waters, either temporarily or permanently, to shellfishing until follow up surveys indicate that fecal coliform bacterial levels have fallen below the established safe threshold. Currently, there are more than 440,000 acres closed to shellfishing in North Carolina's coastal waters.

So if you see a sign reading "Closed Area" you now know it means the shellfish in that water are not safe for people to eat. Identifying and cleaning up sources of contamination are the first steps to restoring coastal shellfish beds. When safe water quality standards can be maintained, once-closed shellfish beds may be reopened for harvest.

*Contributed by Mike Street*



*DPR Photo by Randy Newman*

To learn more about shellfish in North Carolina visit:
www.deh.enr.state.nc.us/shellfish • www.ncfisheries.net/shellfish

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