

**Intergovernmental Protection of Public Health
from Exposure to Waterborne, Illness-Causing Enteric Pathogens**
(Suggested Statement for Use by Public Health and Water Quality Agencies*)

Abstract – Because of the different ways people are exposed to waterborne, illness-causing enteric pathogens such as bacteria and virus, waters can be open for swimming while the same or adjacent waters are closed for shellfish harvesting and vice versa without exposing the public to a heightened risk of illness, when managed under approved programs.

The public may potentially be exposed to illness-causing enteric pathogens such as bacteria and virus while swimming; or eating contaminated raw or undercooked Molluscan shellfish, such as oysters, mussels, or clams. To minimize the risk of illness to the public, the states and the federal government administer coordinated water quality and public health protection programs to advise the public, restrict use, and restore and maintain good water quality. (The term “states” as used in this paper includes tribes and territories)

This paper briefly describes how several of these programs differ, principally in regards to: (1) the nature of the public health risk; (2) where, how, and when the programs monitor water quality; and (3) the actions which the programs can take to protect public health.

Protecting Swimmers and other Recreational Water Users: Beach Advisories

Swimmers, boaters, and other recreational water users such as fishermen and crabbers can suffer gastrointestinal and other illnesses by accidentally ingesting, immersing, or wounding themselves in water that contains enteric pathogens such as bacteria and viruses. Health risks to recreational users can change dramatically from day-to-day, depending on factors such as rainfall and sewage discharge treatment levels. Under the Clean Water Act (CWA) administered by the Environmental Protection Agency (EPA), state and local governments monitor levels of indicator bacteria (i e., E.coli or enterococci) in public swimming waters, as often as daily, and watch for potential problems such as storm water and wastewater treatment system malfunctions, bypasses, and overflows. They may post an advisory or close a beach when monitoring data (compared against standards) or experience predicts a heightened risk to swimmers.

Protecting Shellfish Consumers: Restricting or Closing Harvesting Areas

Consumers of raw and undercooked Molluscan shellfish can be exposed to enteric pathogens such as bacteria or virus that shellfish have accumulated from the water in which they grow. Historical data show the levels of indicator bacteria in Molluscan shellfish generally change more slowly than the levels in the surrounding water. Therefore, it is not necessary to monitor the levels in waters used to manage shellfishing as frequently as estuarine or ocean waters used for swimming and other water-based recreation. Under the National Shellfish Sanitation Program (NSSP) administered by the Food and Drug Administration (FDA), state governments survey the shoreline of shellfish waters to identify actual and potential sources of pollution that can affect water quality. Under the NSSP, states also collect water quality samples to better determine the effect of pollution sources and to help understand how water quality varies in response to currents, tides, and storm events. This information is used to set the management classification for the area, including the monitoring plan. The states then monitor the indicator bacterial content of shellfish harvest waters under approved monitoring plans (as frequently as monthly during harvesting months). The monitoring is conducted in accord with NSSP monitoring guidelines. (The water quality standards against which the monitoring data are compared are different between recreational and shellfish uses because accidental ingestion of water presents different risks than eating raw or undercooked shellfish.) States restrict or close areas to harvesting when monitoring data or experience predict a heightened risk to consumers. Under the NSSP, some shellfish areas are permanently closed due to the elevated risk posed by point sources of human contamination or chemical pollution (e.g., near all sewage treatment plant discharges, and near facilities that may not be treating wastewater properly, may experience overflow or bypass, or which could fail); or when the long-term presence of contamination exceeding standards is documented. Some shellfish areas may be temporarily closed when short-term events known to increase contamination occur (e.g., a storm; treatment system failure, overflow or bypass; or spillage). These temporarily closed areas are re-opened to harvest when monitoring shows the short-term contamination has abated and the water quality meets standards. Monitoring intensity may vary from month-to-month due to local situations, such as the level of seasonal boating activity.

There are areas where shellfishing occurs in the same location as swimming, or where shellfishing otherwise occurs in shallow, in-shore waters. In those areas, particular attention is paid to the changes in water quality because of the area's closer proximity to potential shoreline sources of pollution and the presence of less water to dilute any contamination.

Coordination of Efforts

Federal, state, and local governments are increasing efforts to coordinate beach advisories and shellfish harvest area restrictions, but there will always be some differences. Because predicting heightened risk differs in the ways described above, waters can be open for recreation while the same or adjacent waters are restricted or closed for shellfish harvesting and vice versa, without exposing the public to a heightened risk of illness, when managed under approved programs.

Restoring and Maintaining Water Quality

To reduce and eliminate the need for beach advisories and shellfish harvesting restrictions, federal and state agencies administer programs under the Clean Water Act to restore and maintain surface water quality throughout the United States.

- States and EPA set water quality standards for each water body. Standards for all recreational waters and standards for all shellfish harvesting waters include numerical limits (criteria) on the allowable number of indicator bacteria. The standards are different between recreational and shellfish uses because accidental ingestion of water presents different risks than eating raw or undercooked shellfish. Standards must be set at the level to protect the existing use, but may be set at a more protective level as a goal for the future. Prior to setting, changing, or removing a designated use and associated criteria, for a water body, the state assesses the ability of that water body to meet the criteria to protect the use, and provides the public the opportunity to comment.
- States and federal agencies (both under the CWA and the NSSP) conduct shoreline surveys and monitoring to determine whether the standards are being met, and to identify actual and potential sources of contamination. Where waters do not meet the standards, the states and EPA are required to develop pollution budgets (total maximum daily loads) that are used to govern discharges and cleanup actions.
- States and EPA issue discharge permits for point sources such as wastewater treatment plants to regulate the amount of indicator bacteria that may enter the water body.
- States and federal agencies also work to reduce the amount of indicator bacteria coming from non-point runoff sources such as agricultural land, livestock operations, and under

performing septic systems by implementing best management practices (BMPs) to control non-point pollution.

For further information about these programs, including links to state and tribal sites, see:

Beaches: <https://www.epa.gov/beaches>
Shellfish: <https://www.epa.gov/choose-fish-and-shellfish-wisely>
Water Quality Standards: <https://www.epa.gov/standards-water-body-health>
Monitoring and Assessment: <https://www.epa.gov/science-and-technology/water-science>
Permits: <https://www.epa.gov/npdes>
Non-point Sources: <https://www.epa.gov/polluted-runoff-nonpoint-source-pollution>

*This paper is primarily intended for use by states and tribes as part of their programs as they deem appropriate. As a national-level statement, it is designed to be accurate nation-wide, and therefore it is necessarily general. When used in a nation-wide or multi-state regional context, this limitation and the states' and tribes' principle role should be communicated.