



BACTERIAL MONITORING AND WATER QUALITY STANDARDS



Tillamook Bay—Oregon's third largest estuary—supports a thriving commercial and recreational shellfishing industry. Unfortunately, bacteria concentrations found in all five of the Bay's major tributaries routinely violate state and Federal water quality standards, threatening human health and causing commercial harvest area closures.

As is often the case in estuaries across the country, Tillamook Estuaries Partnership (TEP) knew bacteria came from a combination of point and non-point sources including agricultural runoff, failing septic systems, overloaded municipal treatment plants, and urban stormwater. The tricky part was identifying exactly where these sources were delivering the largest loads and quantifying how much bacteria was threatening the Bay's health.

THE NATIONAL ESTUARY PROGRAM IN ACTION

With its Comprehensive Conservation and Management Plan (CCMP) serving as a guide, the TEP launched an ambitious bacteria research and monitoring effort in the basin.

Data produced from this effort has allowed TEP to apply mitigation efforts exactly where they are needed in order to efficiently and effectively achieve water quality goals. In addition, bacteria data collected through TEP's monitoring was also used by the State of Oregon to create the Tillamook Bay Bacteria Total Maximum Daily Load (TMDL).

TEP began its monitoring program in 1996, launching an extensive Storm-Based Monitoring Program to identify and evaluate bacterial concentrations attributable to the watershed's different land uses. The effort also identified suitable long-term sampling sites for tracking the status and trends of bacteria throughout specific river reaches. A small team of dedicated volunteers joined the effort the following year, and 13,000 samples later, the TEP reported significant progress in 2007. TEP's trend data has led to some important discoveries, including

the determination that forested areas of the watershed generally meet water quality standards for bacteria, indicating that forest wildlife is not a key contributor of bacterial contamination as some thought.

Working with Oregon State University researchers in 2001, the TEP began a three-year genetic marker study in the Tillamook Bay Watershed. The study enabled scientists to discriminate among bacteria from human and ruminant sources. Ruminant sources include cows, elk, and deer. Through the analysis, they

Tillamook Estuaries Partnership



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COLLABORATIVE

found widespread contamination from farm animal waste in specific segments of the river and high concentrations of human waste in other parts. Using the data, watershed managers can now build the best strategies for decreasing fecal pollution indicators in specific areas.

The TEP is working with agricultural landowners, including the local dairy cooperative, which made some important improvements to its discharge system so that its effluent no longer discharges directly into the Wilson River. With a credible, scientific framework the TEP has developed partnerships with local municipalities on habitat restoration and stormwater management projects. Additionally, TEP provides assistance to small landowners by helping to revegetate riparian areas on their property, and offers workshops

and other educational opportunities about the importance of riparian owners and, for agricultural purposes, fencing off riparian areas to prevent livestock from entering streams and rivers. While the lower sections of four of the key rivers in the Tillamook Bay watershed still violate Oregon's water quality standards for recreational use, the fifth tributary, the Wilson River, has been in compliance since 2005, and statistically significant trends indicate that bacteria concentrations remain on a steady decline.

More than a decade's worth of status and trend information is paying off for the TEP with targeted approaches that support successful, efficient implementation of the Comprehensive Conservation and Management Plan. Investing in efforts that strategically target land uses

that contribute to surface water bacteria is bringing the Tillamook Bay watershed closer to coming into compliance with state and Federal water quality standards.

Visit **www.tbnep.org** to learn more about this and other TNEP efforts.

EPA's National Estuary Program (NEP) is a unique and successful coastal watershed-based program established in 1987 under the Clean Water Act Amendments. The NEP involves the public and collaborates with partners to protect, restore, and maintain the water quality and ecological integrity of 28 estuaries of national significance located in 18 coastal states and Puerto Rico.

For more information about the NEP go to www.epa.gov/owow/estuaries.