

Area's population growth puts water quality in jeopardy

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John Dodge , The Olympian

Bobbing like corks on the water near the Narrows Bridge, crew members aboard the research vessel Skookum plunge 300 pounds of testing equipment into the water.

Their purpose: to take water quality readings from one of 80 sampling stations used in the state Department of Ecology's study of dissolved oxygen in South Sound.

Above them, contractors put the finishing touches on the new Narrows Bridge, which is being built to keep up with the same kind of population growth that prompted Ecology's South Sound study in the first place.

Researchers are trying to answer the question: Is South Sound overloaded with nutrients to the point that parts of it could go the way of lower Hood Canal, where oxygen depletion is stressing and killing marine life? Unfortunately, the emerging answer appears to be "yes."

"The truth is South Sound is vulnerable to low dissolved oxygen due to poor water circulation, population growth and nutrient loading," said Bill Dewey, a spokesman for Shelton-based Taylor Shellfish. "Nutrients in South Sound are a serious problem."

Ecology launched the \$400,000 South Sound dissolved oxygen study in October to pinpoint problem areas in the marine waters that border Mason, Thurston and Pierce counties, track potential pollution sources and offer a road map to curb the flow of nutrients into the water.

The study is part of Gov. Chris Gregoire's Puget Sound Initiative, an ambitious and costly plan to make Puget Sound much healthier than it is today by 2020.

The primary cause of oxygen depletion appears to be an excess of nitrogen and other nutrients in parts of the Sound, which causes algal blooms to flourish. When they die and decay, they rob the water of oxygen.

Sources of nitrogen pollution in South Sound include discharges from wastewater treatment plants, septic systems, fertilizers and animal wastes. Some of it enters Puget Sound through sewage discharge pipes and some comes via stormwater runoff.

Nitrogen also is part of the natural ecosystem, noted Ecology marine researcher Mindy Roberts. For instance, alder leaves that drop into streams flowing into Puget Sound and Hood Canal deliver nitrogen; nitrogen also arrives in Puget Sound from the ocean.

"A little bit of nitrogen is a good thing," Roberts told a recent meeting of the House Select Committee on Puget Sound. "Too much is not."

Compiling the data

Julia Bos, an oceanographer and lead researcher for Ecology on the South Sound study, oversees the monthly sampling of the marine water quality stations.

Thousands of sets of data on water temperature, inorganic and organic nitrogen, dissolved oxygen levels, pH, carbon and other water quality indicators are gathered from the bottom of Puget Sound to the water's surface from Oakland Bay in Shelton to Commencement Bay in Tacoma, and all the inlets in between.

Eighteen months of data will be fed into a computer model to look for links between nutrients entering the water and episodes of low dissolved oxygen.

Traveling on the waters of Puget Sound aboard the Skookum and other research vessels the past seven years, Bos has been struck by how much the South Sound shoreline is changing.

"I'm amazed at the huge amount of shoreline development, the deforestation and replacement of native flora and fauna with lawns and homes," she said.

Most of the new homes are served by on-site septic systems, which aren't designed to remove nitrogen from human waste.

"Even a well-functioning septic system delivers nitrogen to the environment," Roberts said.

Data collected from a 2002 water quality study of South Sound, and ongoing water quality sampling by Ecology, show that the greatest trouble spots for low dissolved oxygen are lower Budd Inlet, upper Carr Inlet and upper Case Inlet — all shallow with poor water circulation patterns.

Healthy marine waters have dissolved oxygen levels of 5 parts per million to 7 parts per million. Under 5 ppm can be stressful to marine life and levels below 1 to 2 ppm for more than a few hours can lead to fish kills.

According to Ecology samples, readings in recent years in Budd Inlet have hovered around 3 ppm in the late summer and early fall when the algal blooms are dying and gobbling up oxygen vital to fish and other marine life.

This occurs despite a major investment by the LOTT sewer alliance to curb release of nitrogen. LOTT spent \$47 million in ratepayer money in 1994 to upgrade the wastewater treatment plant in Olympia to remove most of the nitrogen in the effluent before it reaches South Sound.

The persistent dissolved oxygen problem in lower Budd Inlet shows how pollution sources tied to population growth and development, not just wastewater treatment plants, contribute to the problem.

"It would probably be even worse if LOTT had not made the improvements," Bos said.

Meanwhile, the Lacey, Olympia, Tumwater and Thurston County sewer partners are considering a \$15 million project to reduce nitrogen levels in the treated effluent at the Budd Inlet plant by an additional 25 percent, LOTT program manager Karla Fowler said.

However, the sewer partners hope the project would allow them to boost the overall volume of wastewater discharged from the plant, which could leave the total amount of nitrogen going into the water from the plant unchanged.

Ecology is working on an overall pollution budget for the entire Deschutes River watershed, which could determine how much nitrogen loading LOTT is allotted.

The draft report for the pollution budget, called a total daily maximum load, is scheduled for completion later this year, Roberts said.