

“What-if” Scenarios

*June 11 Technical Advisory Committee Meeting for the
South Puget Sound Dissolved Oxygen Study*

The South Puget Sound Dissolved Oxygen Study model will be able to run different “what-if” scenarios. For example, the model can predict how an increase in nitrogen from a particular source would affect dissolved oxygen levels in Case Inlet.

The following six “what-if” scenarios are examples of the types of questions we can use the model to answer. We encourage others to provide Ecology with additional “what-if” scenarios that may be important to them. (Note: we may not have time to run every scenario or combination of scenarios.)

“What-if” Scenario	The model can answer:
What if all human sources of nitrogen were removed? (Compare “natural conditions” to “current conditions”)	Are human sources of nitrogen affecting dissolved oxygen in South Puget Sound? Are those effects causing a violation of the water quality standards? ¹ The two criteria are the numeric criterion and the criterion limiting anthropogenic caused dissolved oxygen decreases to less than 0.2 mg/L compared to natural conditions. If there is a violation of standards, how much would nitrogen discharges need to decrease to attain standards?
What if one source of nitrogen was “turned off” (or one group of sources)?	Does that one source have any impact on dissolved oxygen levels in South Puget Sound?
What if all nitrogen sources increased by 25% (the expected population growth between 2005 and 2025 in Mason, Thurston, Pierce, Kitsap, and King Counties)? By 50%	Would dissolved oxygen levels in South Puget Sound change due to these increases in anthropogenic sources?
What if nitrogen from WWTPs increased 25%, increased 50%, or decreased 50%, or decreased 90%?	The effects of nitrogen from WWTP compared to other sources.
What if nitrogen reduction efforts were targeted to certain locations?	Which locations would see the biggest “bang for the buck” – i.e. where would eliminating 1 pound of nitrogen have the biggest effect on dissolved oxygen?

¹ Found in WAC 173-201(A), available at <http://www.ecy.wa.gov/pubs/0610091.pdf> pages 18-19

What if nitrogen was only reduced during certain times of the year?	Do winter/spring discharges of nitrogen affect the critical period for dissolved oxygen in later summer / early fall?