

Water Quality Assessments Program

2022 Integrated Report Assessment Methodology

Background paper: Delisting method for freshwater fecal coliform listings

Sept. 22, 2020

Background: As part of DEQ's update to its bacteria criteria in 2016, DEQ clarified which beneficial uses were associated with each of the three different bacterial indicators in the state's water quality standards. The criterion for fecal coliform has existed in Oregon's water quality standards since 1979, and is based on EPA's 1976 recommended criteria to protect people who consume filter-feeding shellfish from fecal contamination.

In 1986, EPA published recommended water quality criteria to protect those engaging in full body contact recreation, such as swimming and surfing, in both fresh and coastal waters. These criteria were based on epidemiological studies conducted in the Great Lakes and northeastern United States that linked various bacterial indicators with incidences of gastrointestinal illness.

Analysis of the studies showed that the bacterial indicators *E. coli* and enterococcus were the best indicators of illness in freshwater and that enterococcus was the best indicator in coastal waters. The Environmental Quality Commission adopted the enterococcus criteria for freshwaters and non-shellfish growing estuarine waters to replace the fecal coliform criteria for fresh waters in July 1995. Then, in 1996, the EQC replaced the enterococci criteria with *E. coli* criteria for "freshwaters and non-shellfish harvesting estuaries" for the following reasons:

- *E. coli* test results could be achieved in a faster timeframe than enterococcus results (1 day vs. 2 days).
- *E. coli* criteria were as protective as the enterococcus criteria.
- *E. coli* test results are more specific and may avoid detection of bacteria groups from pulp and paper mills that may mimic enterococcus and show false positive results, even though such groups were not known to be correlated with fecal contamination or human health risk



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Fecal coliform criteria for marine waters and estuarine shellfish growing waters remained in the standards and are identical to the fecal coliform standards currently in effect.

Problem: Pre-1996, when the fecal coliform criteria was applicable to freshwaters, and the year that enterococcus was the freshwater recreational criteria (1995 – 1996), Category 5 303(d) listings for impairment of the recreational use were based on these criteria and TMDLs were developed for these parameters. When *E. coli* was adopted as the freshwater recreational criteria in 1996, these freshwater fecal coliform listings were not modified to reflect the current applicable recreational criteria. There are currently 38 assessment units where fecal coliform TMDLs have been developed, and 27 assessment units that are identified as category 5 for fecal coliform, but no current *E. coli* data have been assessed. The table below illustrates the number of assessment units that have been identified as either Category 5 or 4A for fecal coliform that had corresponding *E. coli* data for the 2018/2020 Integrated Report assessment.

| | Number of Assessment Units With <i>E. coli</i> data | | |
|--------------------------------|--|-------------------------------|-------------------------------|
| | Category 4A for <i>E. coli</i> | Category 5 for <i>E. coli</i> | Category 2 for <i>E. coli</i> |
| Category 4A for Fecal coliform | 26 | 9 | 17 |
| Category 5 for Fecal coliform | 1 | 7 | 17 |

Table 1. Number of fecal coliform impaired assessment units with E. coli data in 2018/2020 Integrated Report

Recommendation: DEQ is proposing to utilize existing *E.coli* data to make the determination of impairment or attainment for the recreational use for those assessment units previously identified as impaired for fecal coliform. This methodology will apply only to those waterbodies where current *E.coli* data exists. *E. coli* monitoring will be required to remove the fecal coliform listing for those fresh waters previously identified as Category 5 for fecal coliforms where no current *E. coli* data exists.