

Abstract

The Washington State Department of Health used a Fecal Pollution Index (FPI) to describe the status of fecal pollution in shellfish growing areas of Puget Sound in 2010. The FPI was also used to rank Puget Sound shellfish growing areas according to fecal pollution impact, and show 13-year (1998-2010) fecal pollution trends in six selected growing areas with extensive histories of remedial action (Drayton Harbor, Portage Bay, Samish Bay, Henderson Inlet, Eld Inlet, and Oakland Bay).

DOH uses criteria set by the National Shellfish Sanitation Program (NSSP) to classify shellfish growing areas:

- Criterion 1:** Concentrations of fecal coliform bacteria in water samples shall not exceed a geometric mean value of 14 organisms per 100ml of sample.
- Criterion 2:** The estimated 90th percentile of fecal coliform shall not exceed 43 MPN per 100ml.
- A minimum of 30 previously collected results are needed to calculate the criteria.
 - Both criteria must be met.

DOH cannot approve a harvest area if significant pollution sources are present even if water quality is acceptable.

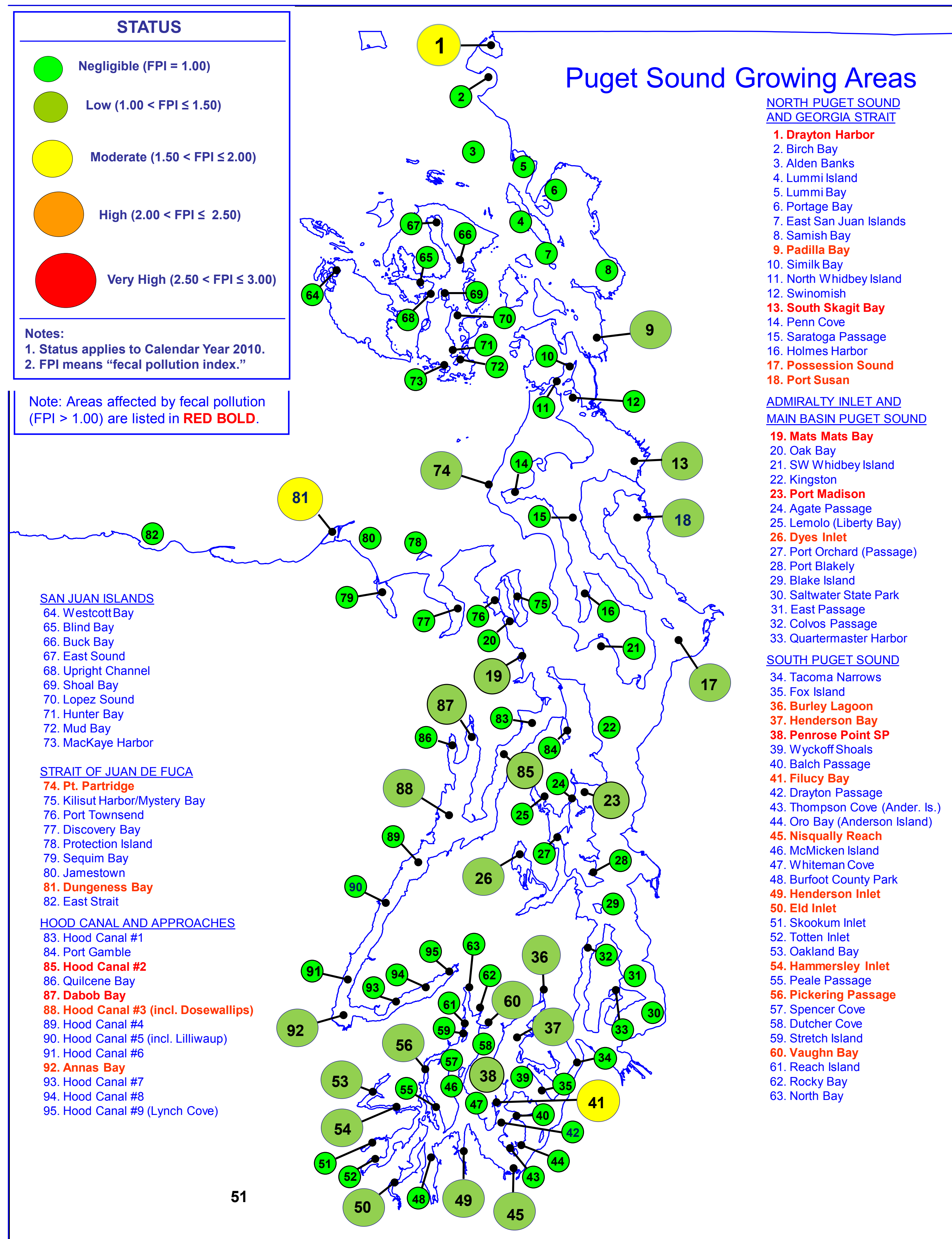
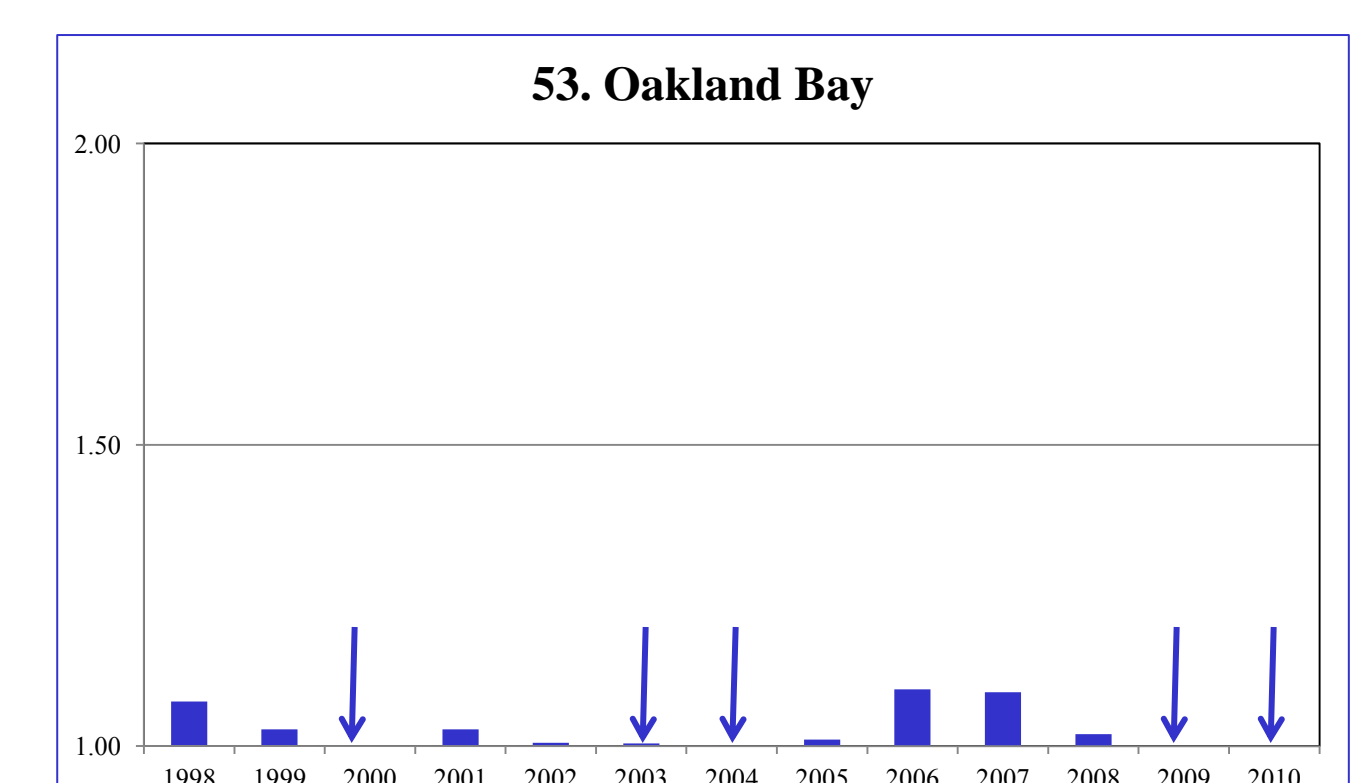
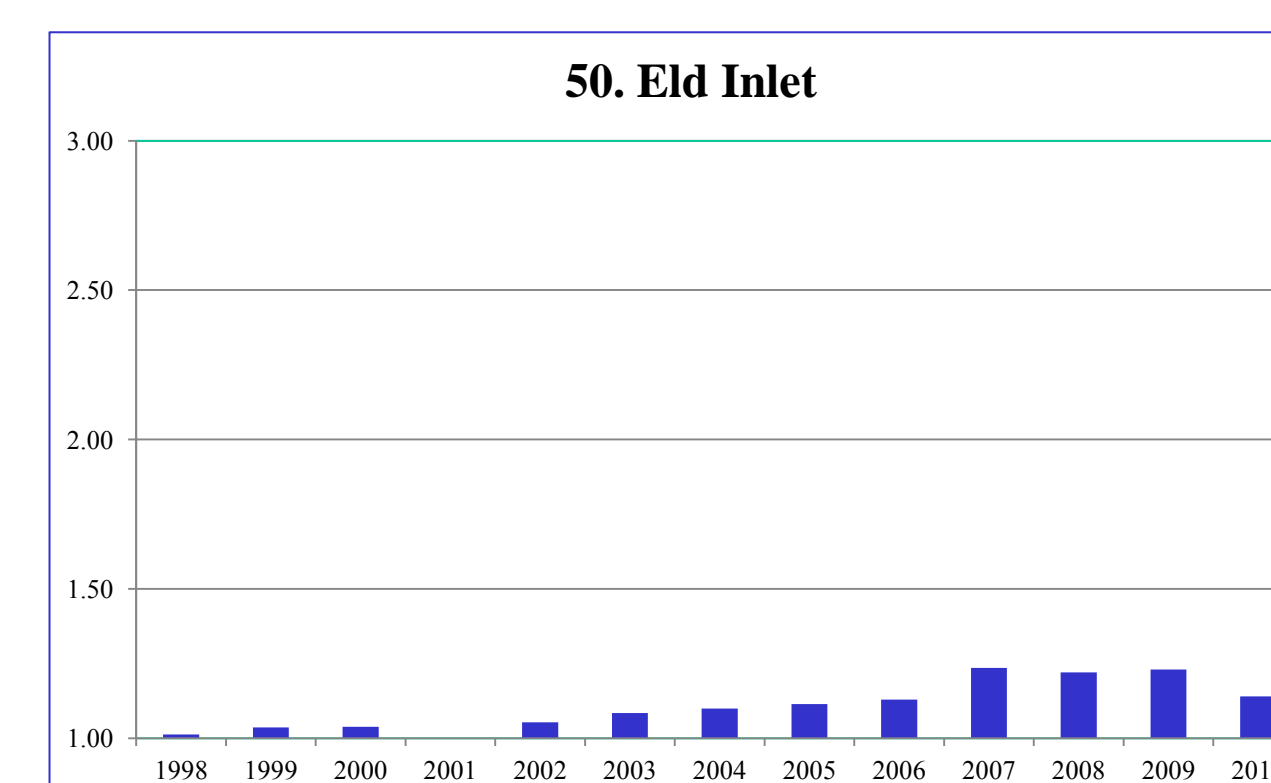
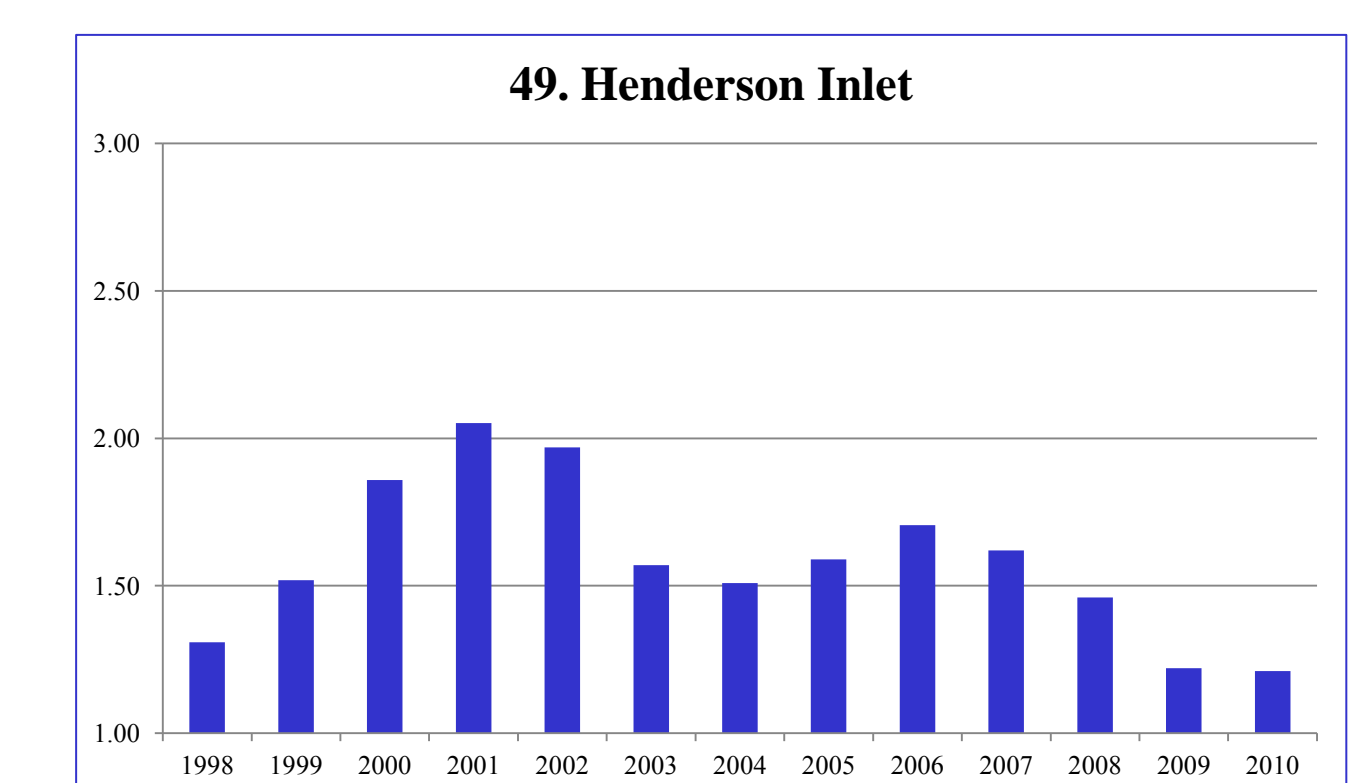
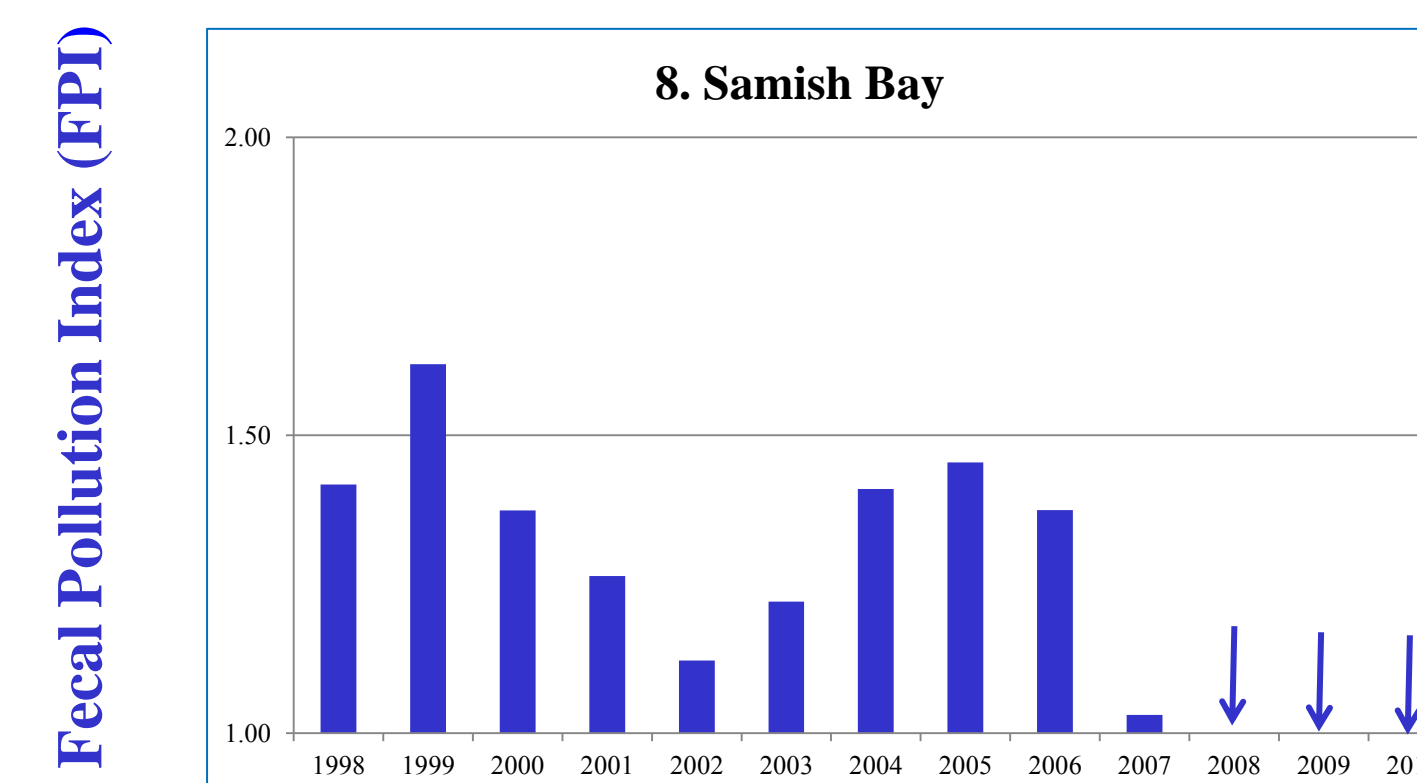
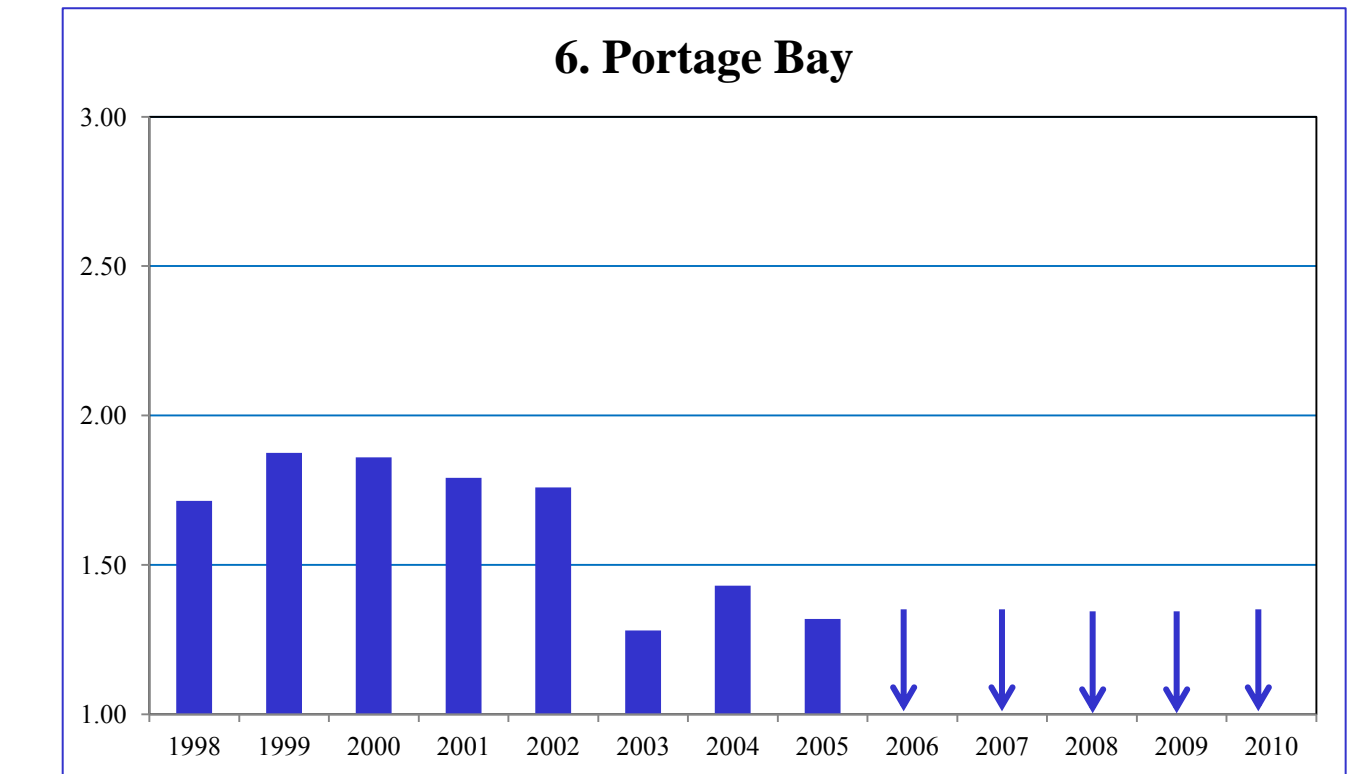
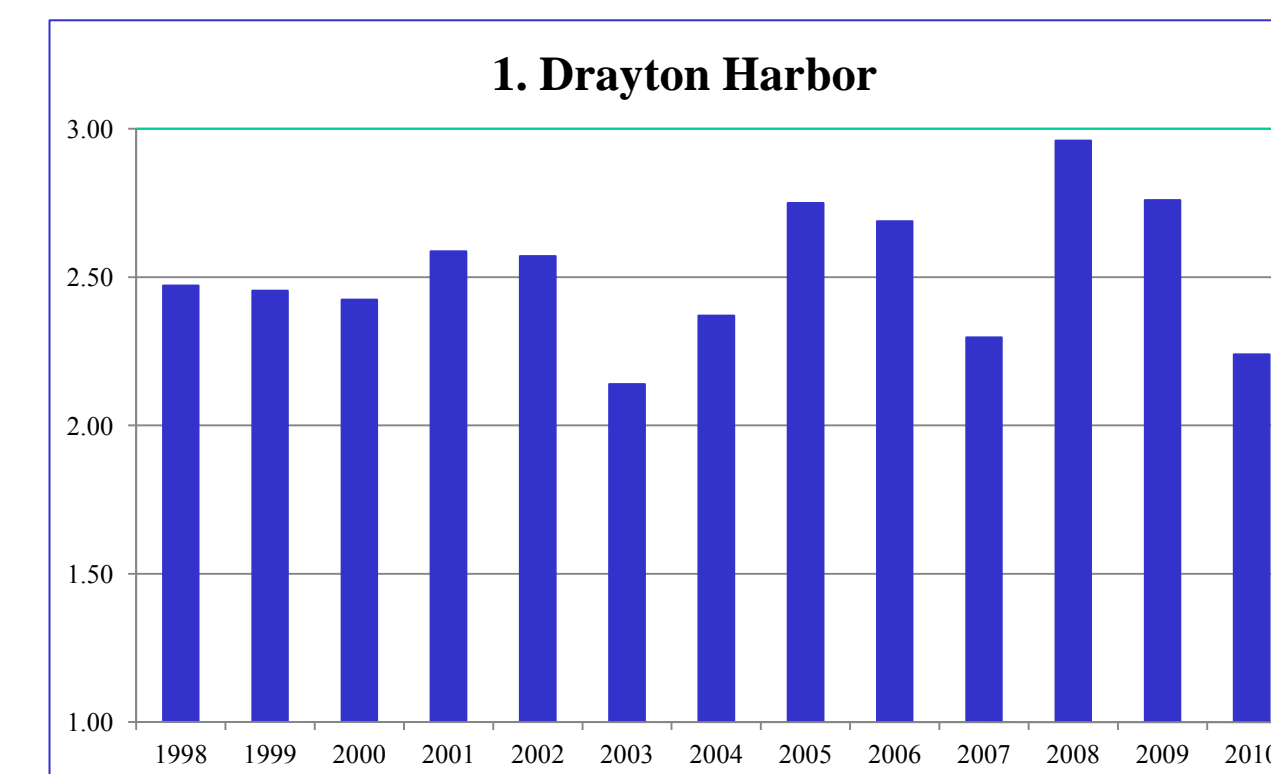


Figure 2. Fecal pollution in six selected shellfish growing areas of Puget Sound (1998-2010). Graphs are numbered according to location in Figure 1. Arrows show years with negligible fecal pollution (FPI = 1.00).



- All six shellfish growing areas showed evidence of fecal pollution reduction in recent years.
- Despite recent decline, fecal pollution in Drayton Harbor has been elevated over the last decade. There is as yet little evidence of a significant reduction.
- Fecal pollution in Portage Bay declined rapidly after major remediation of fecal wastes from dairies along the Nooksack River.
- Fecal pollution in Samish Bay has been low in recent years. However, the growing area is periodically closed due to high risk of fecal contamination from the Samish River during rain storms.
- Fecal pollution in Henderson Inlet has significantly declined over the last decade.
- Fecal pollution in Eld Inlet leveled off in 2007 after a steady increase since 1998.

Figure 3. Shellfish growing areas in Puget Sound are ranked according to fecal pollution impact in 2010. Drayton Harbor ranked highest.

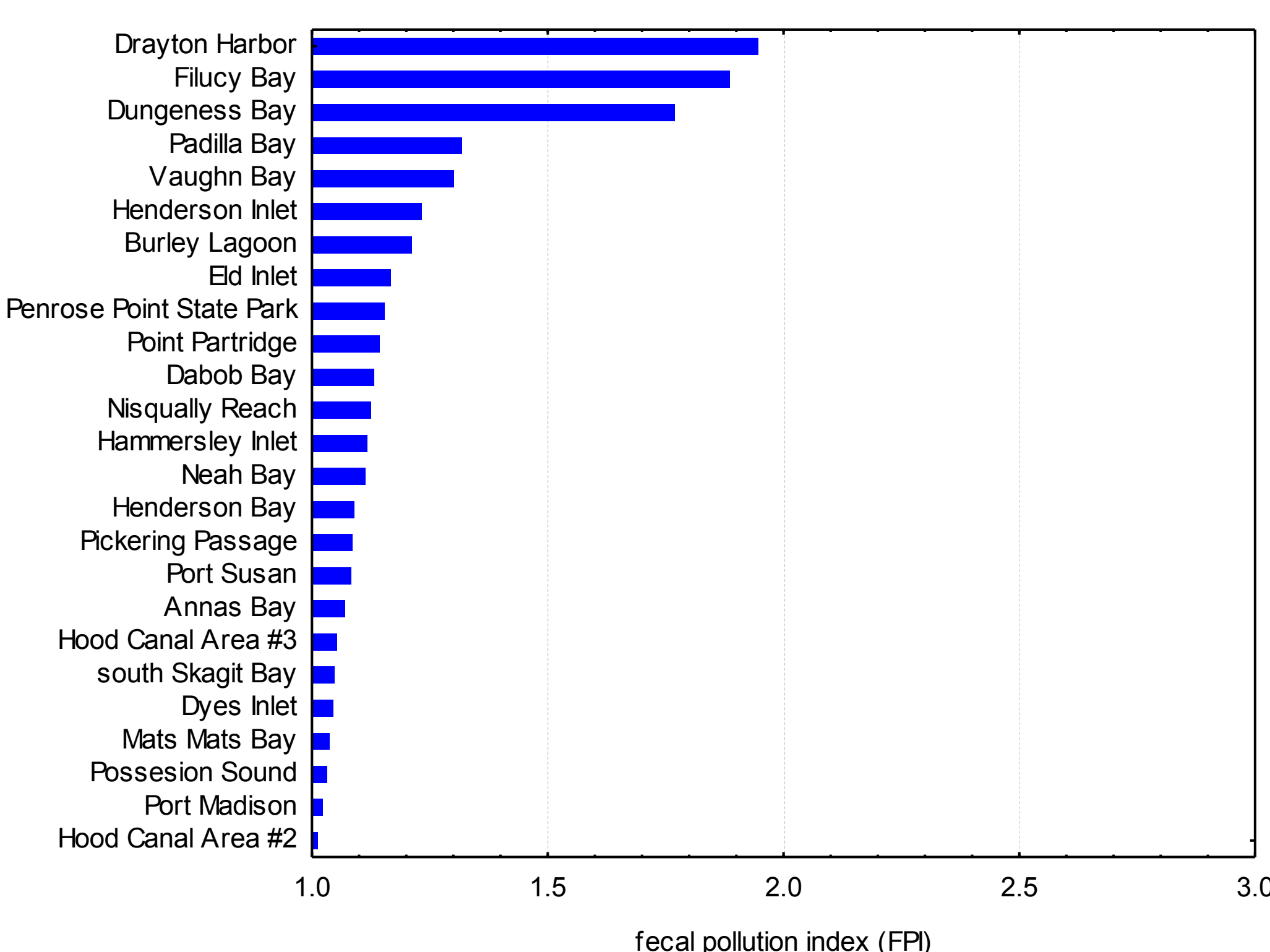
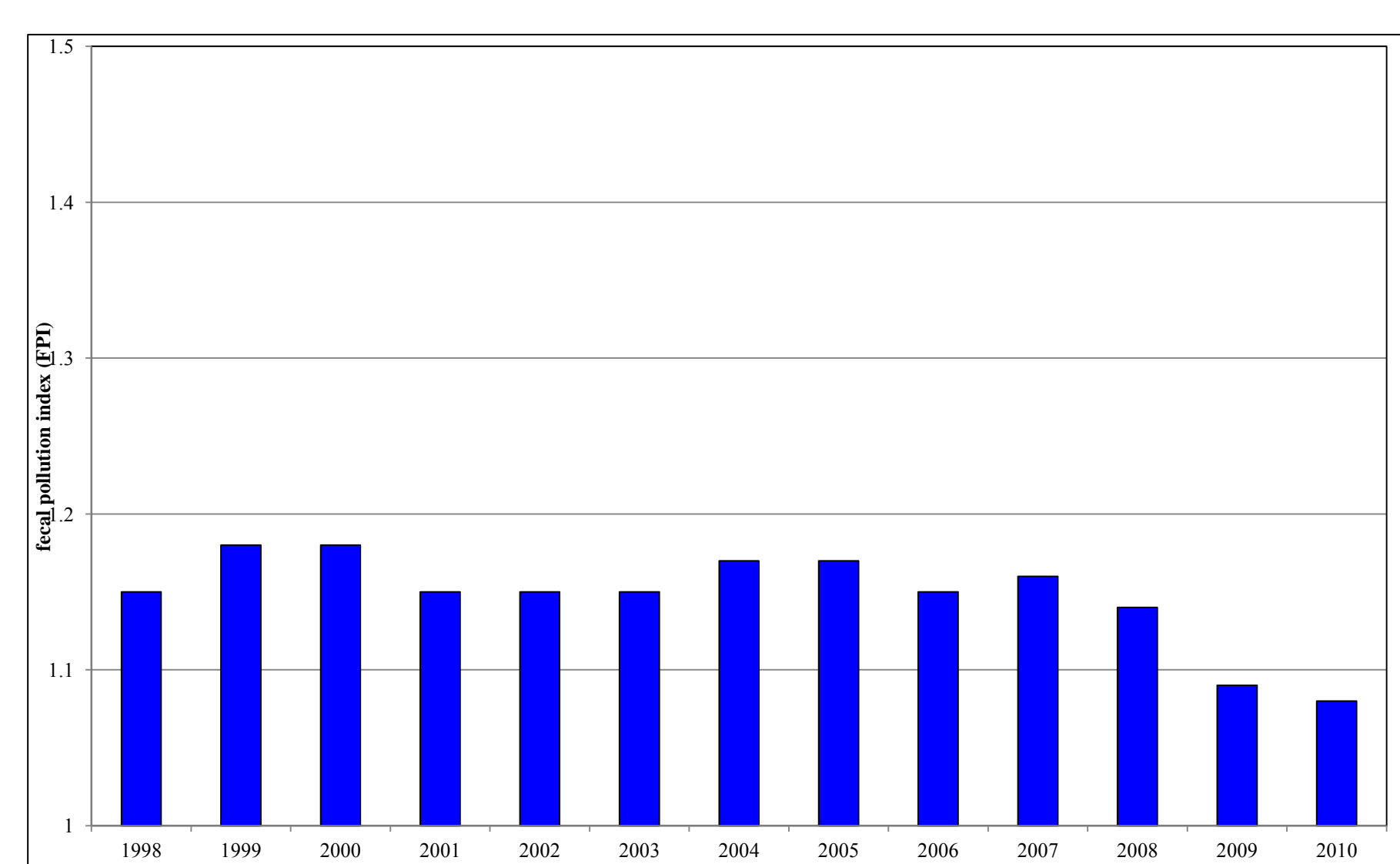


Figure 4. Trend in fecal pollution (1998-2010) in all Puget Sound growing areas combined.



- Fecal pollution in Puget Sound since 1998 has been low overall.
- Fecal pollution has declined progressively since 2007.
- Fecal pollution in 2010 was the lowest since 1998.

The Fecal Pollution Index.

DOH developed a "fecal pollution index" or FPI as a simple unitless measure of fecal pollution impact. Its derivation and use are described in full in Appendix B, WDOH (2010). In brief, each year's 90th percentiles from all stations and all sampling dates are sorted into 3 categories:

- "GOOD" (90th percentiles ≤ 30 MPN/100ml),
- "FAIR" (30 < FPI ≤ 43 MPN/100ml), and
- "BAD" (> 43 MPN/100ml).

The FPI is derived from the weighted proportions of 90th percentiles in each category. Simply stated, the annual FPI may range from 1.0 (100% GOOD 90th percentiles) to 3.0 (100% BAD 90th percentiles).

REFERENCE

Washington State Department of Health (2010). Status and Trends in Fecal Coliform Pollution in Shellfish Growing Areas of Puget Sound: Year 2009. Office of Food Safety and Shellfish Programs. Olympia WA 151 pp. <http://www.doh.wa.gov/ehp/sf/Pubs/fecalreport.pdf>.