# South Sound Sediment Quality & Partnership Opportunities for 2011 Sediment Monitoring in South Puget Sound and Budd Inlet

**Margaret Dutch, Sandra Weakland, Valerie Partridge, Kathy Welch, Edward R. Long**
**Washington State Department of Ecology, Olympia, WA**

## I. Introduction

### South Sound Sediment Quality

- The Washington State Department of Ecology has conducted regional status and trends sediment monitoring for Puget Sound as part of the Puget Sound Assessment and Monitoring Program (PSAMP) since 1997.
- Baseline data for South Puget Sound were collected in 1999 as part of the PSAMP/NOAA survey. The data are summarized and displayed as new modular indices and as a new Sediment Quality Triad Index (SQTI).
- South Sound SQTI summaries are compared to other monitoring regions.

### 2011 Resampling of South Puget Sound

- South Puget Sound Sediment Monitoring Region (total of 73 stations)
  - 5 South Sound Inlets (49 of the 73 region stations)
    - Budd Inlet (30 of the 49 inlet stations)
- **Ecology is actively seeking partnership opportunities for joint sediment sampling in South Puget Sound in 2011.**

## II. South Sound Sediment Quality

- Ecology's recently revised SQTI is a modular index composed of three separate indices:
  - **Sediment Chemistry Index** – based on concentrations of toxic chemicals in the sediments.
  - **Sediment Toxicity Index** – based on the toxicity of sediments to organisms in laboratory tests.
  - **Sediment Benthos Index** – based on the number and kind of invertebrates living in the sediments.

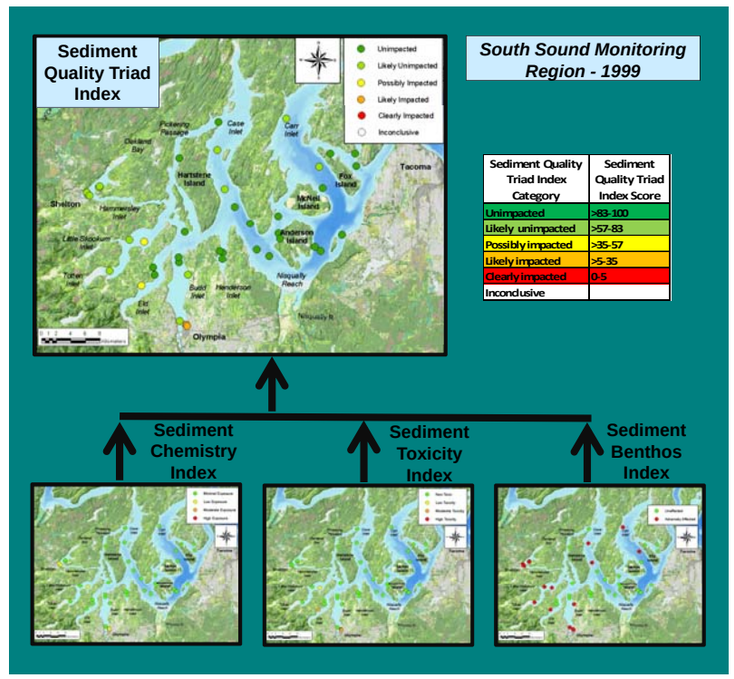
  Samples are scored for each index on a scale of 0 -100 (worst to best) and categorized by severity.
- The three indices are combined into the SQTI for each sample based on a Multiple Lines of Evidence method developed for the state of California (Bay et al., 2009). The SQTI scores are then categorized by severity.
- Figure 1 is a graphic representation of the modular indices and SQTI for the 1999 South Puget Sound regional sediment samples. While the Sediment Chemistry Index and Sediment Toxicity Index were of highest quality in most samples, the Sediment Benthos Index was poorest quality for many. When combined as the SQTI, sediment quality condition was less than the highest quality (i.e., less than "Unimpacted") for many stations due to the influence of the Sediment Benthos Index.
- Figure 2 displays the proportion of area in each SQTI category for the regions based on station weights. A weighted mean SQTI (wmSQTI) is calculated for each region.
- The quality of sediments in the South Sound region was very similar to quality measurements summarized for the Puget Sound-wide sampling frame.

## III. South Sound 2011

- Sediments in the South Puget Sound monitoring region will be resampled in June 2011. A focus study to characterize sediment quality for 5 South Sound Inlets, and for Budd Inlet, will also be conducted simultaneously for Ecology's Urban Waters Initiative.
- 73 stations will be sampled. Various combinations of these stations will be partitioned into 3 sampling frames (Figure 3). Sediment quality will be characterized in each sampling frame.

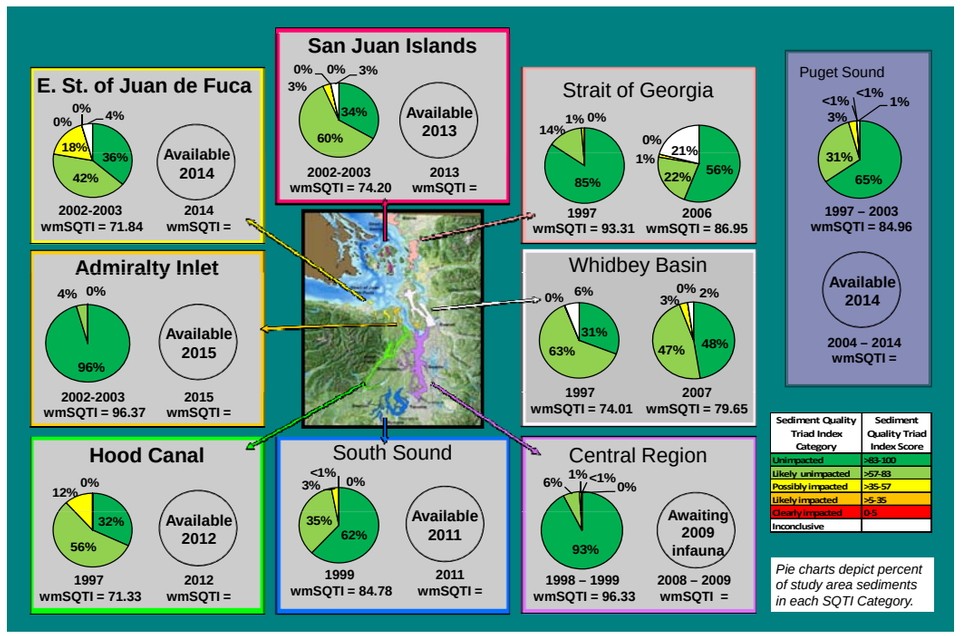
**Sampling Partnerships Sought***

*contact Maggie Dutch
360-407-6021
Margaret.Dutch@ecy.wa.gov




| Sediment Quality Triad Index Category | Sediment Quality Triad Index Score |
|---|---|
| Unimpacted | >83-100 |
| Likely unimpacted | >57-83 |
| Possibly impacted | >35-57 |
| Likely impacted | >5-35 |
| Clearly impacted | 0-5 |
| Inconclusive | |

**Figure 1.** The modular components (Sediment Chemistry, Toxicity, and Benthos Indices) of the Sediment Quality Triad Index for 1999 South Puget Sound sediment sampling.




| Sediment Quality Triad Index Category | Sediment Quality Triad Index Score |
|---|---|
| Unimpacted | >83-100 |
| Likely unimpacted | >57-83 |
| Possibly impacted | >35-57 |
| Likely impacted | >5-35 |
| Clearly impacted | 0-5 |
| Inconclusive | |

**Figure 2.** The Sediment Quality Triad Index for 8 monitoring regions sampled in Puget Sound from 1997 – 2009 calculated as a weighted mean SQTI (wmSQTI) for each region.

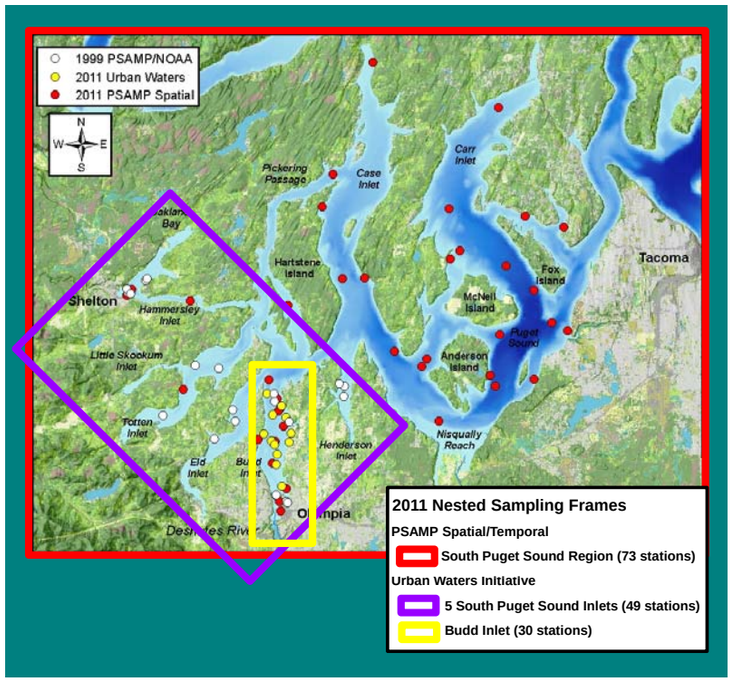



**Figure 3.** 73 Stations and 3 sampling frames for sediment sampling in South Puget Sound in 2011.

General information and all data generated during these surveys can be accessed from Ecology's Marine Sediment Monitoring website: www.ecy.wa.gov/programs/eap/psamp/index.htm
This poster is online at www.ecy.wa.gov/biblio/1003067.html.
The poster was prepared for the South Sound Science Symposium, October 27, 2010, in Shelton, WA.