

Sediment Regional Background



Why It Matters

Cleaning up contaminated sediment is an important step to protect human health and the state's valuable natural resources, such as fish and shellfish.

The **Sediment Management Standards (SMS) rule** WAC 173-204 is used to manage environmental cleanup work, sediment dredging, and sources of sediment contamination.

The SMS, which includes regional background, will help make a cleanup that protect humans and the environment more effective and efficient.

For more information on Regional Background, the SMS rule, and the Sediment Cleanup Users Manual contact:

Chance Asher
Sediment Policy Program Lead
Phone: (360) 407-6914
E-mail: Chance.Asher@ecy.wa.gov

Special accommodations

To request ADA accommodation for disabilities, call Ecology at (360) 407-7170, Relay Service 711, or TTY at 877-833-6341.

Ecology Establishing Regional Background for Sediment

On February 22, 2013, Ecology adopted changes to the Sediment SMS rule and is now implementing the new rule.

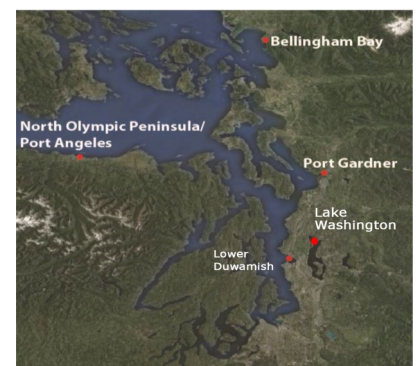
A key provision in the SMS rule is **regional background**. It includes concentrations of bioaccumulative chemicals in sediment primarily from diffuse sources such as stormwater and deposits from the air. These are common chemicals that are found almost everywhere in the environment and concentrate up the food chain. They can include carcinogenic polycyclic hydrocarbons (cPAHs), polychlorinated biphenyls (PCBs), and metals. Regional background varies between regions depending on the level of urbanization.

Establishing regional background for certain areas in Puget Sound is a high priority. Once established, regional background can help:

- Determine the Cleanup Screening level and the upper limit for sediment cleanup levels.
- Inform cleanup decisions, such as cleanup site boundaries and identifying chemicals of concern.
- Identify previously unknown areas of sediment contamination that may need further investigation or cleanup.

Where is Ecology establishing regional background?

Regional background is established for geographically defined areas. We are currently focused on these areas within the Puget Sound region:



How is Ecology studying regional background in these areas?

Ecology selected high priority areas in Puget Sound where we are conducting cleanup to establish regional background. For each area, we developed a study design and worked with stakeholders to refine the approach, collected samples, and analyzed the data as follows:

Port Gardner Bay/Lower Snohomish Estuary (Everett area):

In 2013, Ecology conducted Phase I sampling and drafted a data report that summarized the results. After conducting a series of technical workshops, Ecology decided to conduct supplemental Phase II sampling.

In 2014, Ecology conducted the Phase II sampling, drafted a data report, and held a workshop to discuss the work. The final data summary report was completed and can be found here: http://www.ecy.wa.gov/programs/tcp/sites_brochure/psi/everett/pg-sed.html

North Olympic Peninsula (Port Angeles and Port Townsend area):

In 2013, Ecology conducted sampling and analysis of the data. After conducting a series of workshops, Ecology decided to also establish a separate regional background value for carcinogenic polycyclic hydrocarbons applicable to Port Angeles Harbor.

In 2016, a final data summary and evaluation report was completed and can be found here: http://www.ecy.wa.gov/programs/tcp/sites_brochure/portAngelesHarborSed/background.html

Lower Duwamish Waterway (Seattle area): In response to comments for the Port Gardner and North Olympic Peninsula work mentioned above, in September 2013 Ecology had an early scoping discussion with stakeholders on Elliott Bay and the Lower Duwamish Waterway (LDW). Based on comments, Ecology decided to focus on the LDW. The Pollutant Loading Study for the LDW may help inform the regional background work so we will defer further work until that study has progressed.

Bellingham Bay (Bellingham area):

In 2014, Ecology conducted sampling and a series of workshops with stakeholders to provide an early opportunity to comment on the work before any reports were drafted.

In 2015 a final data summary report was completed and can be found here: http://www.ecy.wa.gov/programs/tcp/sites_brochure/blhm_bay/study.html

Lake Washington Area (Seattle): In 2015, Ecology analyzed existing data from the Lake Washington area to establish regional background. A draft data summary report is available for review and comment by October, 2016. Ecology will conduct a technical workshop on October 20, 2016. The workshop goals are to 1) present the study 2) answer questions and 3) discuss stakeholder ideas on how to improve the report. You may find more information here: <http://www.ecy.wa.gov/programs/tcp/smu/lakeWa/reg-bg-study.html>



How is Ecology developing the regional background sampling plans? Ecology is using guiding principles from the SMS rule as we develop sampling plans as follows:

Conceptual Model: For each geographic area, a conceptual model (for example, a marine embayment) is developed to guide selection of appropriate sampling areas.

Sampling and Sources. Regional background includes chemical concentrations in sediment from diffuse sources. Diffuse sources include such things as stormwater and air deposition that are not directly attributable to a specific source or release. Examples of specific sources, and areas that may be directly influenced by them, include the immediate depositional zone from stormwater pipes or a cleanup site. To ensure regional background does not include the direct influence from specific sources, Ecology is considering the following:

The locations of any active or historical stormwater outfalls.

The boundaries of established cleanup sites.

Areas directly influenced by active, historic, or suspected shoreline sources.

Dredged material disposal sites.

Distance from the shoreline or any known source.

If sampling results show a specific contamination source(s) not known before, we may exclude the data .

Representative Sampling Area. For each area, we are defining a representative area to sample based on the conceptual model. We are using an ArcGIS model to define these areas based on current geography, hydrology, sediment transport mechanisms, and known or suspected sources.

Sampling Independence and Random Sampling. We are setting a minimum distance between sampling locations to ensure independent results. We are using a model to randomly select sampling locations. We determined the minimum number of samples necessary to have appropriate statistical power and took extra samples for potential supplemental analysis.

Chemicals of Concern. The focus for regional background is on chemicals that bioaccumulate through the food chain and can harm people and aquatic life. In general, we are analyzing for metals, carcinogenic polycyclic aromatic hydrocarbons, dioxins/furan congeners, polychlorinated biphenyl congeners, grain size of sediment, total organic carbon, and total solids.

Regulatory Requirements. The studies are designed to be consistent with the requirements in the SMS and Model Toxics Control Act rules and Ecology's Sediment Cleanup User's Manual guidance.

Quality Assurance / Quality Control. Data is undergoing a quality assurance review and validation at the QA 2/EPA Stage 4 level. This high level of data review allows use for regulatory purposes.

How is regional background different from natural background? Regional background includes the primary influence of chemicals from diffuse sources such as stormwater and air deposits that may be from the local area. Natural background includes the influence of chemicals from globally distributed sources and is expected to be lower than regional background in more urbanized areas.



How will Ecology interpret the data results? We will interpret data results by:

- Evaluating the data using statistics to see if the data are the same or different population(s).
- Analyzing potential data outliers to verify if they are or are not true outliers.
- Analyzing differences in natural and regional background populations.

How have we addressed comments on the regional background work? Ecology requested input from interested stakeholders on the sampling and analysis plans and data reports for the regional background work. We heard some common themes:

- Stakeholders would like earlier participation with Ecology before drafting future sampling and analysis plans and data summary reports.
- Stakeholders were concerned that we sampled too far from the shoreline and sources which was not representative of regional background for Port Gardner and the North Olympic Peninsula.

In response to all comments received in 2013, Ecology reviewed the SMS rule, the original framework of the sampling plans, and re-analyzed current and historical data for Port Gardner Bay and North Olympic Peninsula. Based on this analysis, Ecology:

- Redesigned the Port Gardner sampling plan.
- Applied the lessons learned to design the sampling plan for Bellingham Bay and conducted early stakeholder engagement.
- Determined to use existing data in Port Angeles Harbor to establish regional background for cPAHs applicable to the harbor.
- Prior to making decisions, we conducted an early scoping workshop to discuss the concept of establishing regional background for the Lower Duwamish Waterway and Elliott Bay.

Additional Information Documents for each regional background study are available here:

Port Gardner: http://www.ecy.wa.gov/programs/tcp/sites_brochure/psi/everett/pg-sed.html

North Olympic Peninsula: http://www.ecy.wa.gov/programs/tcp/sites_brochure/portAngelesHarborSed/background.html

Bellingham Bay: http://www.ecy.wa.gov/programs/tcp/sites_brochure/blhm_bay/study.html

Lower Duwamish: http://www.ecy.wa.gov/programs/tcp/sites_brochure/lower_duwamish/lower_duwamish_hp.html

Lake Washington Area: <http://www.ecy.wa.gov/programs/tcp/smu/lakeWa/reg-bg-study.html>

SMS Rule WAC 173-204: http://www.ecy.wa.gov/programs/tcp/smu/sed_standards.htm

