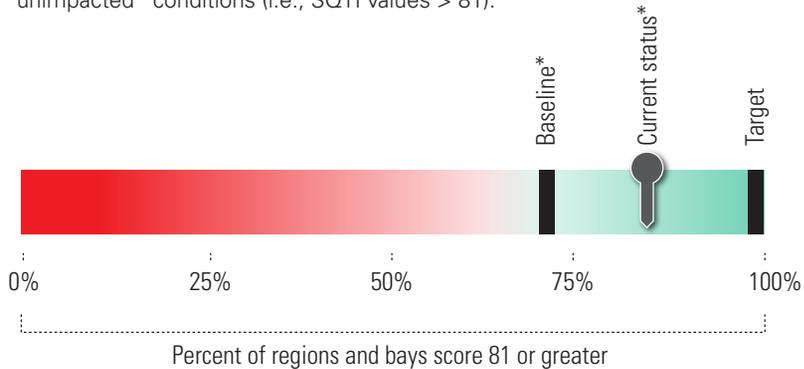


Marine Sediment Quality

Sediment Quality Triad Index

Progress Toward the 2020 Target

All Puget Sound regions and bays, as characterized by ambient monitoring, achieve the following: Sediment Quality Triad Index (SQTI) scores reflect "unimpacted" conditions (i.e., SQTI values > 81).



* The baseline is the percentage of the regions and urban bays that were re-sampled and that were at or exceeded the target value in the first round of sampling from 1997-1999. The status is the percentage for the second round of sampling from 2004-2009. Results show slight progress. However, caution must be used in this interpretation as the SQTI values suggest a decline in six of the seven re-sampled areas, even though they remained above the target value of 81.

Is There Progress Toward the 2020 Target?

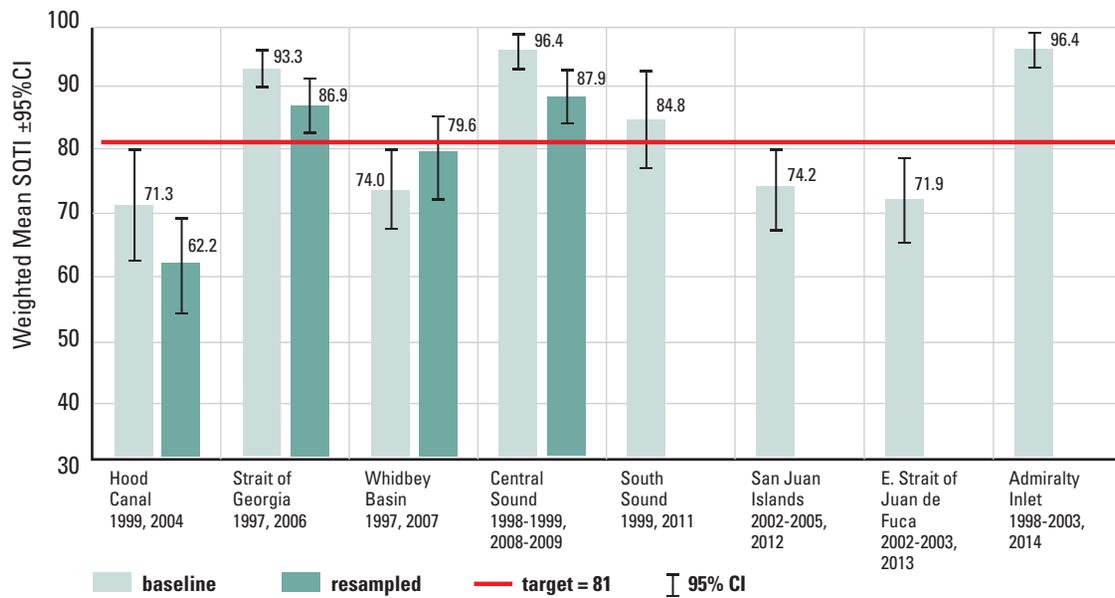
While there has been a slight increase in the number of regions and bays that meet the target value relative to baseline measurements, there was a tendency towards a decline in Sediment Quality Triad Index (SQTI) scores for the majority of regions and urban bays.

The SQTI combines sediment chemistry, sediment toxicity, and benthic invertebrate community data into a single, broad measure of sediment quality. The SQTI and the related Sediment Chemistry Index are two of the three indicators of sediment quality adopted by the Leadership Council. The third target

is about meeting Sediment Quality Standards. Sediment quality was unimpacted in a slim majority of regions and urban bays in Puget Sound. This is indicated by the SQTI scores meeting or exceeding the target values in four of eight regions and three of five urban bays. In the remainder of the regions and bays, sediment quality was below the desired target value.

The percentage of re-sampled regions and urban bays that met the target value increased relative to baseline scores. However, the trends in SQTI scores raise a concern. Most individual SQTI scores tended towards a decline over time

Weighted Mean Sediment Quality Triad Index (SQTI) Scores in 8 Puget Sound Regions



compared to the baseline measurements. These declines were not necessarily sufficient to cause scores to go below the target value. These results suggest that sediment quality declined somewhat throughout the regions and urban bays in Puget Sound, and underlying measurements indicate that this decline was primarily due to declines in the number and types of benthic invertebrates, and sometimes in increased toxicity values, rather than a measurable change in sediment chemistry.

One notable exception to the trend is the Whidbey Basin, where sediment quality appears to have improved slightly, enough to reach the target value in the second round of sampling.

Deterioration in overall sediment quality was most noteworthy in Central Puget Sound. This change was driven by an increase in the number of stations with adversely affected sediment-dwelling invertebrate assemblages, in addition to increased levels of toxicity harmful to organisms. The exact reasons for the deterioration in sediment quality are not well known and would require further study to determine. It is possible that a combination of natural and human-caused factors was involved (e.g., dissolved oxygen levels or contaminants not measured in this survey).

Weighted Mean Sediment Quality Triad Index (SQTI) Scores in 6 Puget Sound Urban Bays

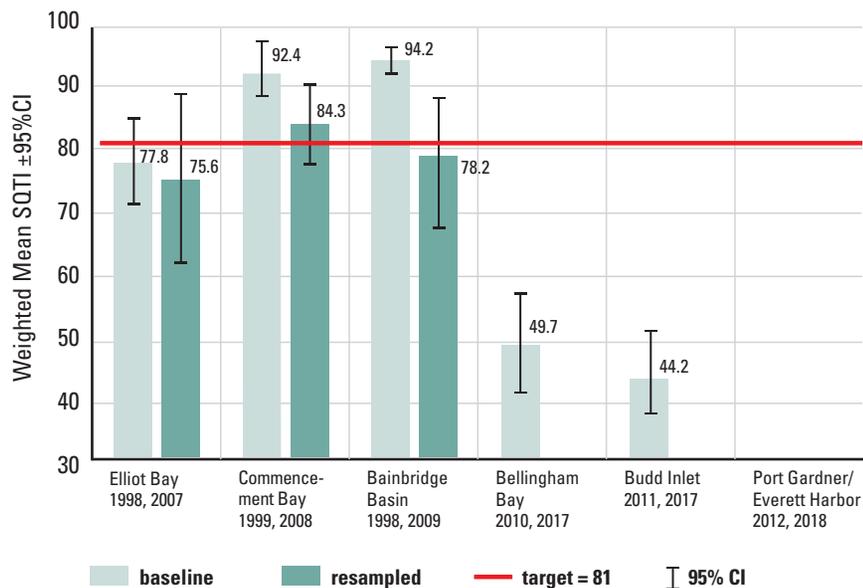


Figure 3.19. Sediment Quality Triad Index, reported for eight regions and six urban bays in Puget Sound. Light bars show results for first-round sampling efforts. Dark bars show results for second-round re-sampling. The higher the index value, the higher the sediment quality.

Sources: Washington State Department of Ecology, Marine Sediment Monitoring Team

Indicator Lead:

Maggie Dutch, Washington State Department of Ecology

For more in-depth information, please see:

http://www.psp.wa.gov/vitalsigns/marine_sediment_quality.php

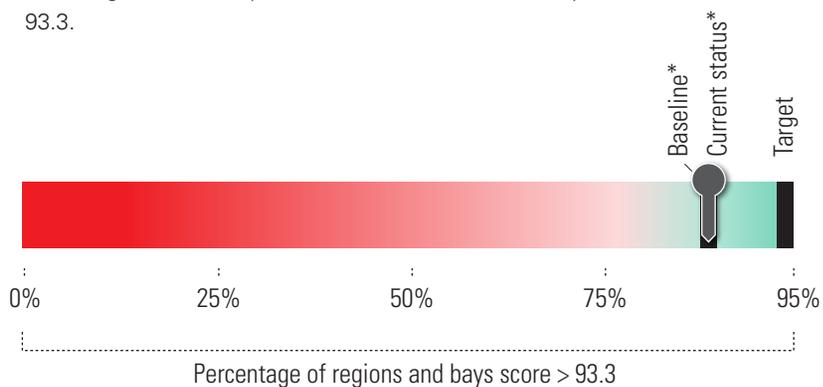
photo opposite page credit: Jonathan Bridgman

Marine Sediment Quality

Sediment Chemistry Index[†]

Progress Toward the 2020 Target

By 2020, all Puget Sound regions and bays achieve chemistry measures reflecting minimum exposure with Sediment Chemistry Index (SCI) scores > 93.3.



* The baseline is the percentage of the regions and urban bays that were re-sampled and that were at or exceed the target value in the first round of sampling from 1997-1999. The status is the percentage for the second round of sampling from 2004-2011.

Is There Progress Toward the 2020 Target?

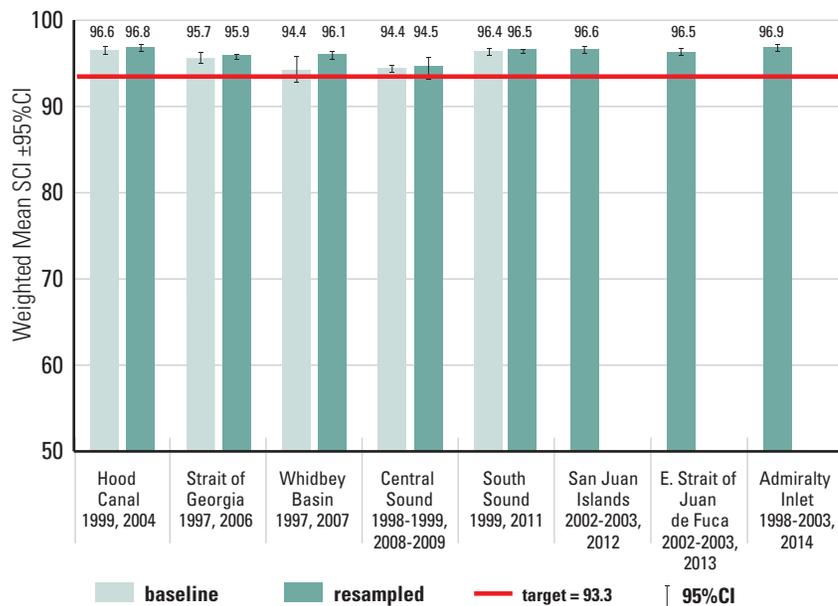
Sediment Chemistry Index scores for all regions and all urban bays — except Elliott Bay — either met or exceeded the target value, reflecting minimal exposure to chemical contamination.

In all areas that were sampled twice, none showed change compared to the baseline. An improvement in Elliott Bay is noteworthy, although the change was not significant.

Therefore, we remain close to the 2020 goal that all regions and bays have minimal exposure to harmful chemicals.

[†] This report is adapted from the *2012 State of the Sound* because no new data were available.

Weighted Mean Sediment Chemistry Index (SCI) Scores for 8 Puget Sound Regions



Weighted Mean Sediment Chemistry Index (SCI) Scores for 6 Puget Sound Urban Bays

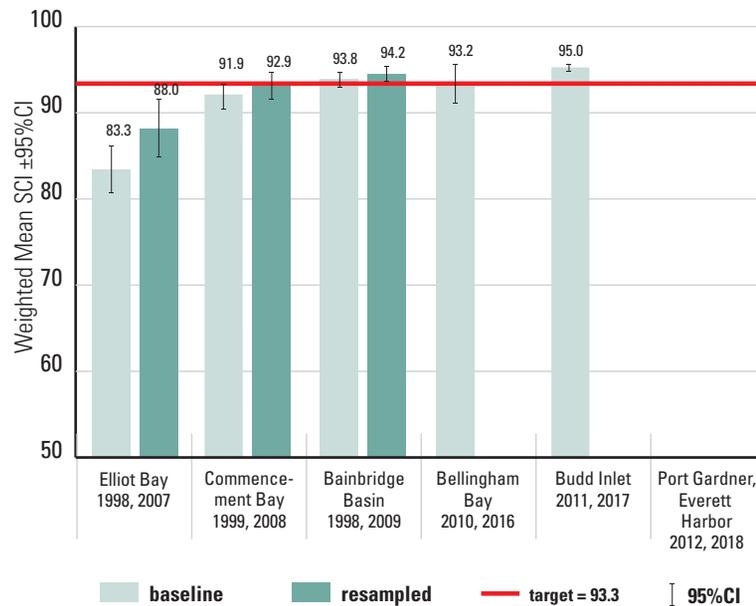


Figure 3.20. Sediment Chemistry Index (SCI), reported for eight regions and six urban bays in Puget Sound. Light bars show results for first round sampling efforts. Dark bars show results for second round re-sampling. Higher values indicate healthier sediments.

Source: Washington State Department of Ecology, Marine Sediment Monitoring Team

Indicator Lead:

Maggie Dutch, Washington State Department of Ecology

For more in-depth information, please see:

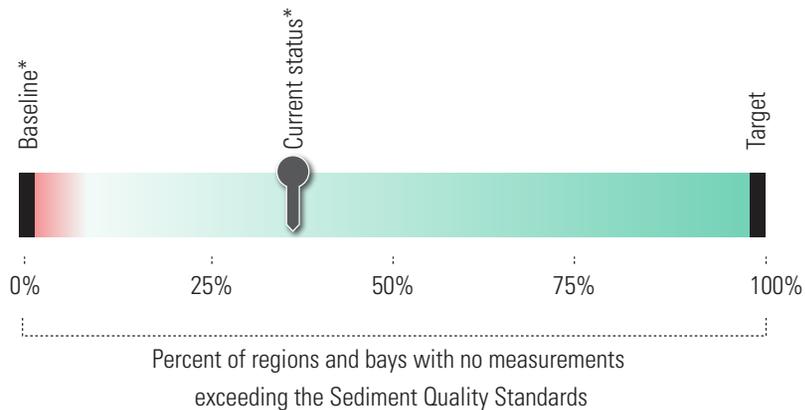
www.psp.wa.gov/vitalsigns/marine_sediment_quality.php

Marine Sediment Quality

Chemical measurements that exceed the Washington State Sediment Quality Standards[†]

Progress Toward the 2020 Target

Have no sediment chemistry measurements exceeding the Sediment Quality Standards (SQS) set for Washington state.



*The baseline is the percentage of the regions and urban bays that were re-sampled and that had chemical measurements meeting the Sediment Quality Standards during the first round of sampling from 1997-1999. The status is the percentage during the second round of sampling from 2004-2011.

Is There Progress Toward the 2020 Target?

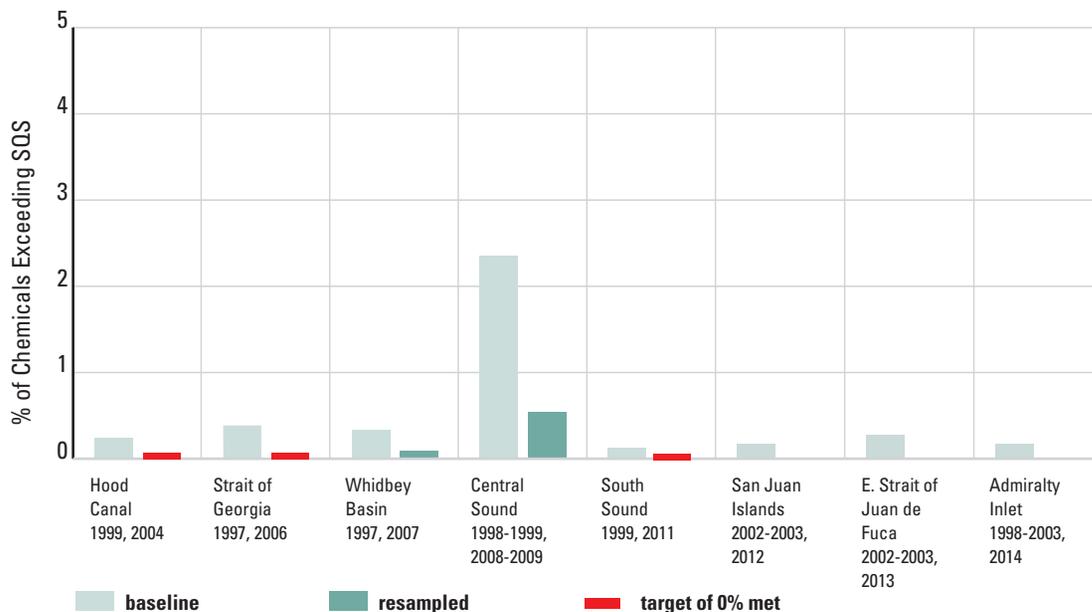
The percent of chemical measures exceeding Sediment Quality Standards (SQS) has declined for most regions and bays, and thus show progress towards meeting their target value.

The percent of individual chemicals exceeding SQS over the past decade was typically small (mostly less than 1 percent), except for Central Sound, Elliott Bay, and Commencement Bay, where the number still never exceeded 5 percent.

In the most recent round of sampling, even fewer chemicals exceeded state SQS compared to the baseline measurements. Three regions dropped to zero and now meet the target value. In Central Puget Sound and Elliott Bay, values declined by more than a percentage point.

[†]This report is adapted from the *2012 State of the Sound* because no new data were available.

Percent of Chemicals Exceeding Sediment Quality Standards (SQS) for 8 Puget Sound Regions



Although the target is not fully met across all of Puget Sound, recent improvements suggest progress toward the target.

Percent of Chemicals Exceeding Sediment Quality Standards (SQS) for 6 Puget Sound Urban Bays

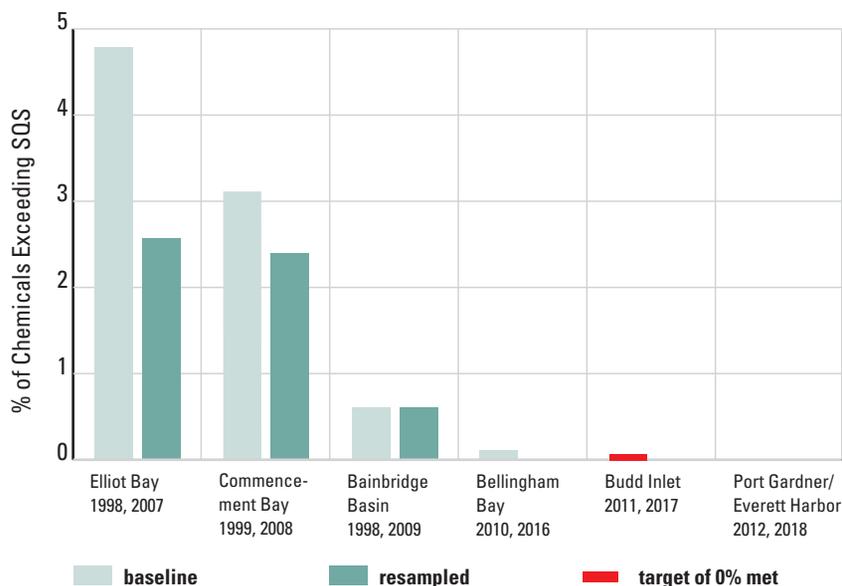


Figure 3.21. Chemicals exceeding the Sediment Quality Standards (SQS) reported for eight regions and six urban bays in Puget Sound. Light bars show results for first round sampling efforts. Dark bars show results for second round re-sampling.
Sources: Washington State Department of Ecology, Marine Sediment Monitoring Team

Indicator Lead:
Maggie Dutch, Washington State Department of Ecology

For more in-depth information, please see:
http://www.psp.wa.gov/vitalsigns/marine_sediment_quality.php

photo opposite page credit: Ian Ruotsala