

2012 Port Gardner Bay Marine Sediment Monitoring



Sediment Toxicity Data Summary

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Results and Statistical Summaries

Amphipod Survival

Results of amphipod survival tests for 30 sediment samples from the 2012 Port Gardner Bay survey.

Data are expressed as mean percent survival and as percentage of control response.

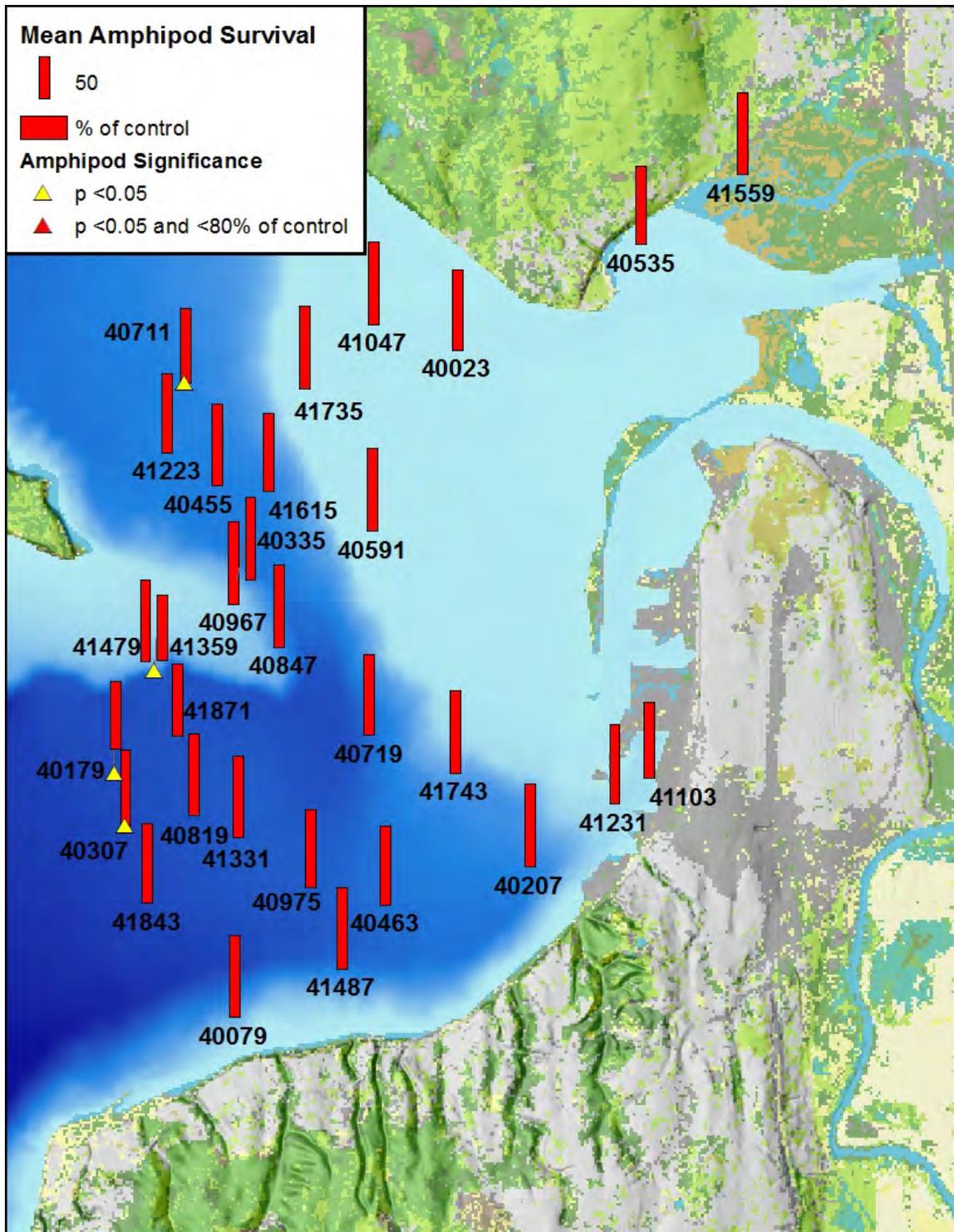
Tests were performed with *Eohaustorius estuarius*.

* = Results statistically significant (t-test, $\alpha = 0.05$).

** = Results statistically significant and mean survival <80% of control.

| Station | Mean amphipod survival (%) | Mean amphipod survival (% of control) | Statistical significance |
|---------|----------------------------|---------------------------------------|--------------------------|
| 40023 | 93 | 97 | |
| 40079 | 97 | 100 | |
| 40179 | 77 | 81 | * |
| 40207 | 98 | 100 | |
| 40307 | 87 | 92 | * |
| 40335 | 100 | 100 | |
| 40455 | 97 | 100 | |
| 40463 | 91 | 96 | |
| 40535 | 92 | 96 | |
| 40591 | 96 | 100 | |
| 40711 | 87 | 91 | * |
| 40719 | 94 | 99 | |
| 40819 | 94 | 99 | |
| 40847 | 96 | 100 | |
| 40967 | 100 | 100 | |
| 40975 | 89 | 94 | |
| 41047 | 96 | 100 | |
| 41103 | 89 | 93 | |
| 41223 | 92 | 96 | |
| 41231 | 91 | 96 | |
| 41331 | 96 | 100 | |
| 41359 | 76 | 80 | * |
| 41479 | 96 | 100 | |
| 41487 | 94 | 99 | |
| 41559 | 98 | 100 | |
| 41615 | 90 | 95 | |

| Station | Mean amphipod survival (%) | Mean amphipod survival (% of control) | Statistical significance |
|---------|----------------------------|---------------------------------------|--------------------------|
| 41735 | 98 | 100 | |
| 41743 | 97 | 100 | |
| 41843 | 92 | 97 | |
| 41871 | 84 | 88 | |



Spatial patterns in sediment toxicity determined with the amphipod *Eohaustorius estuarius* (control-corrected % survival) in the 2012 Port Gardner Bay survey.

The numbers on the map are the station identifications.

Urchin Fertilization

All data rejected due to laboratory errors

Toxicity

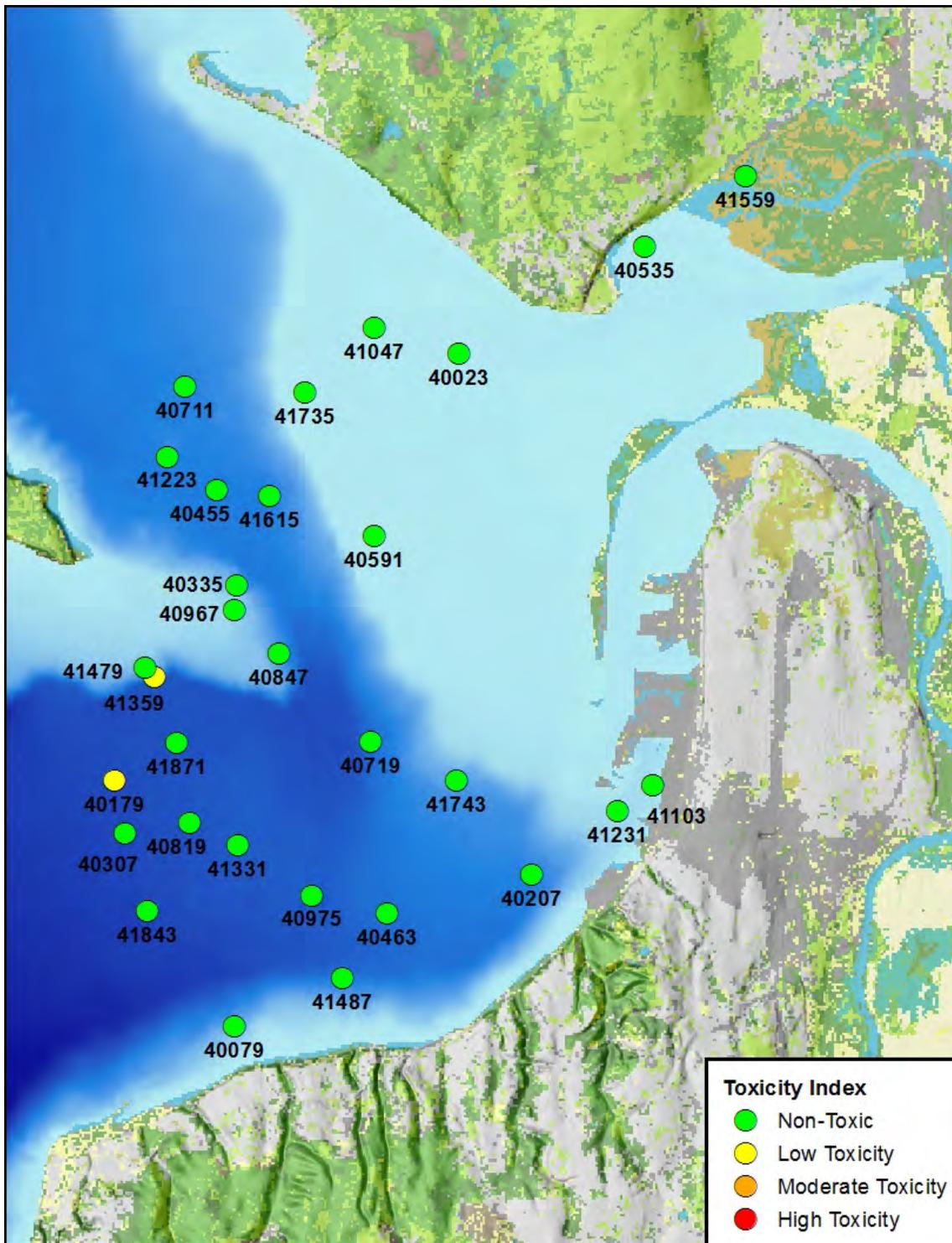
Estimated incidence and spatial extent of toxicity in the 2012 Port Gardner Bay survey.

| Critical Value Exceeded | Stations | | Area | |
|---|----------|---------|------|---------|
| | No. | (%) | No. | (%) |
| Total Study Area | 0 | (100.0) | 38.1 | (100.0) |
| Amphipod survival (10-day) ¹ | 4 | (13.3) | 5.1 | (13.3) |

¹ Results statistically significant and mean percent survival <80% of control

Incidence and spatial extent of chemical toxicity in the 2012 Port Gardner Bay survey as measured with the Sediment Toxicity Index.

| Sediment Toxicity Index Category | Stations | | Area | |
|----------------------------------|----------|---------|-----------------|---------|
| | No. | (%) | km ² | (%) |
| Everett | 0 | (100.0) | 38.1 | (100.0) |
| Non-Toxic | 28 | (93.3) | 35.6 | (93.3) |
| Low Toxicity | 2 | (6.7) | 2.5 | (6.7) |
| Moderate Toxicity | 0 | (0.0) | 0 | (0.0) |
| High Toxicity | 0 | (0.0) | 0 | (0.0) |



Spatial patterns in Sediment Toxicity Index in the 2012 Port Gardner Bay survey.

The numbers on the map are the station identifications

Comparison with the Region and all of Puget Sound

Incidence and spatial extent of toxicity in the 2012 Port Gardner Bay study area, Whidbey Basin monitoring region, and all of Puget Sound.

| Monitoring Region | Year(s) sampled | Numbers of Samples | Sea Urchin Fertilization Test | | Amphipod Survival Test | | |
|--------------------|-----------------|--------------------|-------------------------------------|----------------------------|--|---------------------------|----------------------------|
| | | | Incidence (% of stations) | Spatial Extent (% of area) | Test Species | Incidence (% of stations) | Spatial Extent (% of area) |
| Port Gardner Bay | 2012 | 30 | No sea urchin test results for 2012 | | <i>Eohaustorius estuarius</i> | 13.3 | 13.3 |
| Whidbey Basin | 1997 | 39 | 25.6 | 6.0 | <i>Ampelisca abdita</i> | 0.0 | 0.0 |
| | 2007 | 40 | 5.0 | 3.3 | No amphipod test results for 2007 | | |
| All of Puget Sound | 1997-2003 | 381 | 10.2 | 4.5 | <i>Ampelisca abdita</i> , <i>Eohaustorius estuarius</i> | 0.3 | 0.05 |

Incidence and spatial extent of toxicity in 2012 Urban Waters Initiative study area, Whidbey Basin monitoring region, and all of Puget Sound as measured with the Sediment Toxicity Index.

| Sediment Toxicity Index Category | Baseline | | | | Second Baseline | | | |
|----------------------------------|------------|----------------|-----------------|----------------|----------------------|---------|-----------------|---------|
| | Stations | | Area | | Stations | | Area | |
| | No. | (%) | km ² | (%) | No. | (%) | km ² | (%) |
| Port Gardner Bay | 30 | (100.0) | 38.1 | (100.0) | Available after 2018 | | | |
| Non-Toxic | 28 | (93.3) | 33.0 | (93.3) | | | | |
| Low Toxicity | 2 | (6.7) | 2.5 | (6.7) | | | | |
| Moderate Toxicity | 0 | (0.0) | 0 | (0.0) | | | | |
| High Toxicity | 0 | (0.0) | 0 | (0.0) | | | | |
| Whidbey Basin | 39 | (100.0) | 338.1 | (100.0) | 40 | (100.0) | 353.3 | (100.0) |
| Non-Toxic | 29 | (74.4) | 317.8 | (94.0) | 37 | (92.5) | 333.4 | (94.2) |
| Low Toxicity | 2 | (5.1) | 19.7 | (5.8) | 1 | (2.5) | 8.2 | (2.3) |
| Moderate Toxicity | 2 | (5.1) | 0.1 | (0.0) | 1 | (2.5) | 11.5 | (3.3) |
| High Toxicity | 6 | (15.4) | 0.5 | (0.1) | 1 | (2.5) | 0.3 | (0.1) |
| Total Study Area | 381 | (100.0) | 2294.1 | (100.0) | Available after 2014 | | | |
| Non-Toxic | 335 | (87.9) | 2182.3 | (95.1) | | | | |
| Low Toxicity | 15 | (3.9) | 35.27 | (1.5) | | | | |
| Moderate Toxicity | 24 | (6.3) | 75.73 | (3.3) | | | | |
| High Toxicity | 7 | (1.8) | 0.78 | (0.0) | | | | |

Laboratory Reports

[Amphipod survival toxicity tests lab report](#)