

# **2015 Bainbridge Basin Marine Sediment Monitoring**



## **Sediment Quality Triad Data Summary**

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## Results

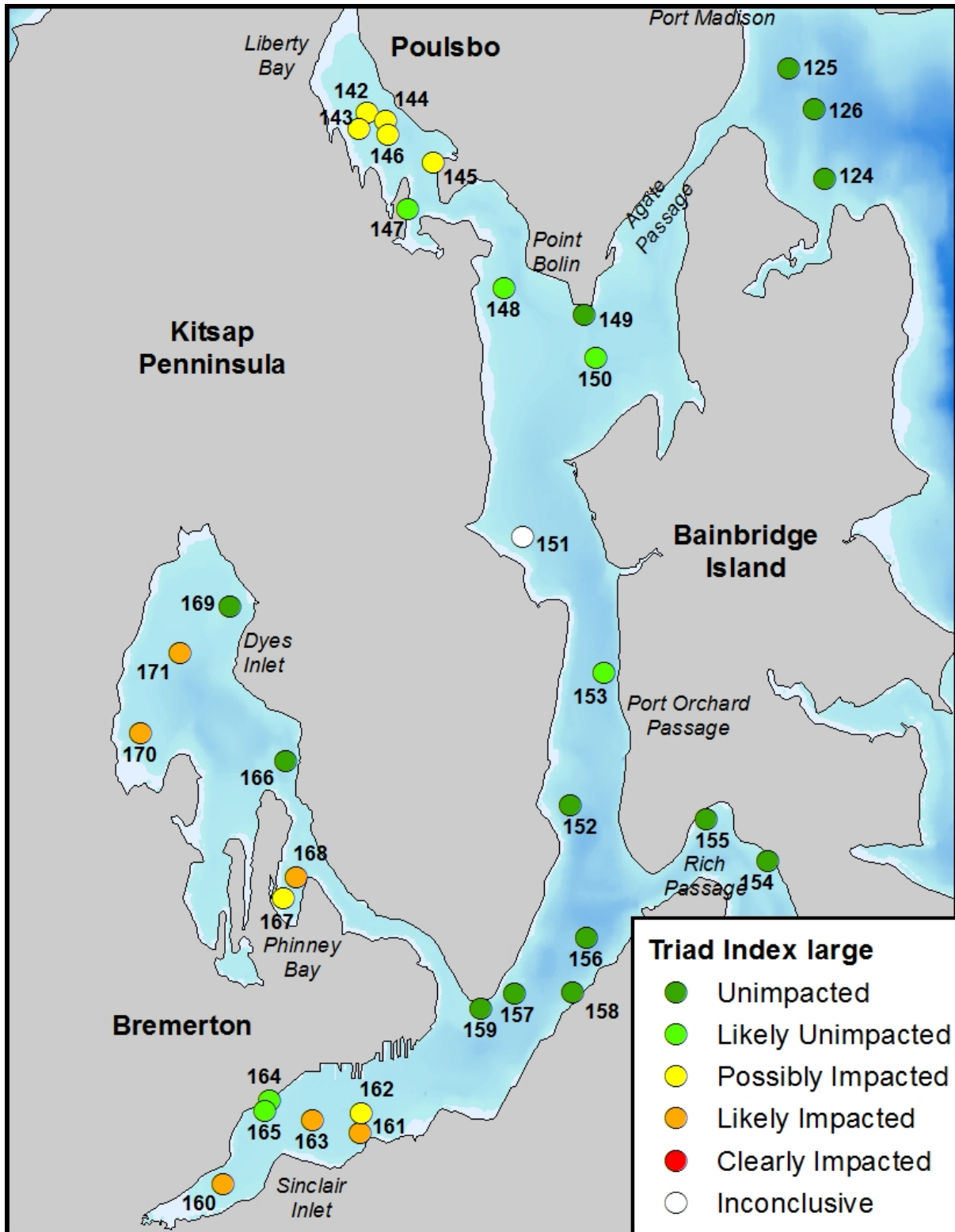
Sediment Triad Quality Index categories identified for stations in the 2015 Bainbridge Basin sediment survey.

Station	Location	Chemistry Index	Toxicity Index	Benthic Index	Triad Index
124	Port Madison	Minimum exposure	Non-Toxic	Unaffected	Unimpacted
125	Port Madison	Minimum exposure	Non-Toxic	Unaffected	Unimpacted
126	Port Madison	Minimum exposure	Non-Toxic	Unaffected	Unimpacted
142	Liberty Bay	Minimum exposure	Moderate	Adversely Affected	Possibly impacted
143	Liberty Bay	Minimum exposure	Moderate	Adversely Affected	Possibly impacted
144	Liberty Bay	Minimum exposure	Moderate	Adversely Affected	Possibly impacted
145	Liberty Bay	Low exposure	Low	Adversely Affected	Possibly impacted
146	Liberty Bay	Minimum exposure	Moderate	Adversely Affected	Possibly impacted
147	Liberty Bay	Minimum exposure	Non-Toxic	Adversely Affected	Likely unimpacted
148	Southeast of Keyport	Minimum exposure	Non-Toxic	Adversely Affected	Likely unimpacted
149	North Port Orchard Pt. Bolin	Minimum exposure	Non-Toxic	Unaffected	Unimpacted
150	North Port Orchard	Minimum exposure	Non-Toxic	Adversely affected	Likely unimpacted
151	North Port Orchard E. of Brownsville	Minimum exposure	Low	Adversely affected	Inconclusive
152	Port Orchard Illahee	Minimum exposure	Non-Toxic	Unaffected	Unimpacted
153	Port Orchard	Minimum exposure	Non-Toxic	Adversely Affected	Likely unimpacted
154	Rich Pass Pleasant Beach	Minimum exposure	Non-Toxic	Unaffected	Unimpacted
155	Rich Pass Lynwood Center	Minimum exposure	Non-Toxic	Unaffected	Unimpacted
156	South Port Orchard	Minimum exposure	Non-Toxic	Unaffected	Unimpacted
157	South Port Orchard East Bremerton	Minimum exposure	Non-Toxic	Unaffected	Unimpacted
158	South Port Orchard	Minimum exposure	Non-Toxic	Unaffected	Unimpacted
159	South Port Orchard Pt. Herron	Minimum exposure	Non-Toxic	Unaffected	Unimpacted
160	Sinclair Inlet	Low exposure	Moderate	Adversely Affected	Likely impacted
161	Sinclair Inlet	Low exposure	Moderate	Adversely Affected	Likely impacted
162	Sinclair Inlet	Low exposure	Low	Adversely Affected	Possibly impacted
163	Sinclair Inlet	Low exposure	Moderate	Adversely Affected	Likely impacted
164	Sinclair Inlet	Low exposure	Non-Toxic	Adversely Affected	Likely unimpacted
165	Sinclair Inlet	Low exposure	Non-Toxic	Adversely Affected	Likely unimpacted

Station	Location	Chemistry Index	Toxicity Index	Benthic Index	Triad Index
166	Dyes Inlet Tracyton	Minimum exposure	Non-Toxic	Unaffected	Unimpacted
167	Phinney Bay	Low exposure	Low	Adversely Affected	Possibly impacted
168	Phinney Bay	Low exposure	Moderate	Adversely Affected	Likely impacted
169	Dyes Inlet SE of Silverdale	Minimum exposure	Non-Toxic	Unaffected	Unimpacted
170	Dyes Inlet N. Chico Bay	Low exposure	Moderate	Adversely Affected	Likely impacted
171	Dyes Inlet	Low exposure	Moderate	Adversely Affected	Likely impacted

Spatial extent of Sediment Triad Quality Index categories for the 2015 Bainbridge Basin survey.

Chemistry Index	Toxicity Index	Benthic Index	Triad Index	Spatial extent (% of Area)
Minimum exposure	Non-Toxic	Adversely Affected	Unaffected	55.33
Low exposure			Likely unimpacted	15.92
				2.75
Minimum exposure	Moderate			3.49
Low exposure	Low			3.73
	Moderate			14.64
Minimum exposure	Low		Inconclusive	4.15



Spatial patterns of sediment condition in the 2015 Bainbridge Basin sediment survey, as measured with the Sediment Quality Triad Index.

*The numbers on the map are the station identifications.*

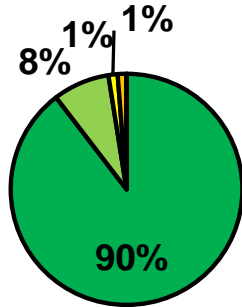
Incidence and spatial extent of sediment condition in the 2015 Bainbridge Basin sediment survey, as measured with the Sediment Quality Triad Index.

Sediment Triad Index Category	Stations		Area	
	No.	(%)	km <sup>2</sup>	(%)
Bainbridge Basin	33	(100.0)	81.9	(100.0)
Unimpacted	13	(39.4)	45.3	(55.3)
Likely unimpacted	6	(18.2)	15.3	(18.7)
Possibly impacted	7	(21.2)	5.9	(7.2)
Likely impacted	6	(18.2)	12.0	(14.6)
Clearly impacted	0	(0.0)	0.0	(0.0)
Inconclusive	1	(3.0)	3.4	(4.2)

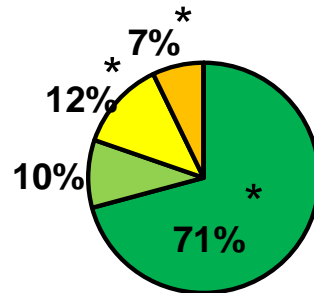
## Comparison of Sediment Quality Triad Index Categories by Year

Estimated spatial extent (percent of area) and 95% confidence intervals for each of the SQTI categories for the Bainbridge Basin in 2015, compared to 1998 and 2009.

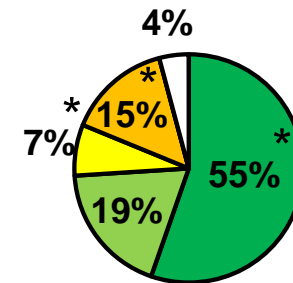
Sediment Quality Triad Index Category	1998			2009			2015		
	Estimate	Confidence limit		Estimate	Confidence limit		Estimate	Confidence limit	
		Lower	Upper		Lower	Upper		Lower	Upper
Unimpacted	90.90	66.70	82.14	70.82*	46.64	69.32	55.34	34.31	56.31
Likely unimpacted	6.58	3.47	7.31	9.52	1.67	13.91	18.68	5.18	25.40
Possibly impacted	1.29	0.00	2.82	12.48	2.74	17.70	7.21	3.11	8.69
Likely impacted	1.22	0.00	2.62	7.18*	0.00	13.00	14.62	3.85	20.09
Clearly impacted	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Inconclusive	0.00	0.00	0.00	0.00	0.00	0.00	4.15	0.00	8.96



1998



2009\*



2015\*

Spatial and temporal patterns in estimated spatial extent (percent of area, shown in pie charts) for the Triad Index categories in the Bainbridge Basin.

\* = significantly different from 1998 (Kincaid, 2005,  $\alpha=0.05$ )

## Comparison with the Region

Incidence and spatial extent of sediment quality in the Bainbridge Basin, Central Puget Sound, and all of Puget Sound, as measured with the Sediment Quality Triad Index.

Sediment Quality Triad Index Category	Baseline				Second Round				Third Round			
	Stations		Area		Stations		Area		Stations		Area	
	No.	(%)	km <sup>2</sup>	(%)	No.	(%)	km <sup>2</sup>	(%)	No.	(%)	km <sup>2</sup>	(%)
<b>Bainbridge Basin</b>	33	(100.0)	81.9	(100.0)	33	(100.0)	81.9	(100.0)	33	(100.0)	81.9	(100.0)
Unimpacted	25	(75.8)	73.3	(89.6)	17	(51.5)	58.0	(70.8)	13	(39.4)	45.3	(55.3)
Likely unimpacted	6	(18.2)	6.5	(7.9)	5	(15.2)	7.8	(9.5)	6	(18.2)	15.3	(18.7)
Possibly impacted	1	(3.0)	1.1	(1.3)	8	(24.2)	10.2	(12.5)	7	(21.2)	5.9	(7.2)
Likely impacted	1	(3.0)	1.0	(1.2)	3	(9.1)	5.9	(7.2)	6	(18.2)	12.0	(14.6)
Clearly impacted	0	(0.0)	0.0	(0.0)	0	(0.0)	0.0	(0.0)	0	(0.0)	0.0	(0.0)
Inconclusive	0	(0.0)	0.0	(0.0)	0	(0.0)	0.0	(0.0)	1	(3.0)	3.4	(4.2)
<b>Central Sound</b>	128	(100.0)	683.9	(100.0)	80	(100.0)	667.4	(100.0)				
Unimpacted	86	(67.2)	636.5	(93.1)	53	(66.3)	480.6	(72.0)				
Likely unimpacted	24	(18.8)	40.2	(5.9)	16	(20.0)	126.9	(19.0)				
Possibly impacted	11	(8.6)	5.1	(0.7)	4	(5.0)	7.5	(1.1)				
Likely impacted	6	(4.7)	1.9	(0.3)	4	(5.0)	5.7	(0.9)				
Clearly impacted	1	(0.8)	0.1	(0.0)	0	(0.0)	0.0	(0.0)				
Inconclusive	0	(0.0)	0.0	(0.0)	3	(3.8)	46.7	(7.0)				
<b>Total Study Area</b>	381	(100.0)	2294.1	(100.0)	368	(100.0)	2207.6	(100.0)				
Unimpacted	231	(60.6)	1501.4	(65.4)	196	(53.3)	1233.6	(55.9)				
Likely unimpacted	105	(27.6)	692.1	(30.2)	113	(30.7)	662.9	(30.0)				
Possibly impacted	24	(6.3)	66.7	(2.9)	22	(6.0)	72.4	(3.3)				
Likely impacted	14	(3.7)	3.0	(0.1)	9	(2.4)	41.7	(1.9)				
Clearly impacted	2	(0.5)	0.2	(0.0)	0	(0.0)	0.0	(0.0)				
Inconclusive	5	(1.3)	30.5	(1.3)	28	(7.6)	197.0	(8.9)				