DEPARTMENT OF
ECOLOGY
State of Washington

2014 Addendum to Quality Assurance Project Plan

The Puget Sound Ecosystem Monitoring Program: Sediment Monitoring at Long-term Stations and in Admiralty Inlet and Commencement Bay

January 2014

Publication No. 14-03-102

Publication Information

Addendum

This addendum is on the Department of Ecology's website at
https://fortress.wa.gov/ecy/publications/SummaryPages/1403102.html

This addendum is an annual addition and update to an original Quality Assurance Project Plan. The addendum is not a correction (errata) to the original plan.

Data for this project will be available on Ecology's Environmental Information Management (EIM) website at www.ecy.wa.gov/eim/index.htm. Search Study IDs: PSAMP_LT (for Long-term program); PSAMP_SP (for Regional program); UWI2014 (for Urban Bays program).

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Ecology's Activity Tracker code for this addendum is 01-900.

Original Publication

Quality Assurance Project Plan: The Puget Sound Assessment and Monitoring Program: Sediment Monitoring Component

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2014 Addendum to Quality Assurance Project Plan

The Puget Sound Ecosystem Monitoring Program: Sediment Monitoring at Long-term Stations and in Admiralty Inlet and Commencement Bay

January 2014

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Signatures are not available on the Internet version.
EAP: Environmental Assessment Program
EIM: Environmental Information Management database

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Ongoing Sediment Monitoring Programs

The Washington State Department of Ecology (Ecology) Marine Sediment Monitoring Team (MSMT) will conduct sediment sampling in April and June, 2014, as part of the Puget Sound Ecosystem Monitoring Program (PSEMP)[1]. The PSEMP Sediment Component consists of three annual monitoring programs, including the:

1. Long-term[2] − Conducted at ten stations located throughout Puget Sound and sampled annually each April since 1989 (or longer).
2. Regional[3] − Forty stations sampled within one of eight geographic regions annually each June since 1997. Sampling rotates among the regions over a ten-year period. A new set of randomly-selected stations are sampled each time a region is revisited.
3. Urban Bays[4] − Thirty randomly-selected stations sampled within one of six urban bays annually each June since 2007. Sampling rotates among the bays over a six-year period. The same set of randomly-selected stations is sampled each time an urban bay is revisited.

The goal of each is to characterize sediment quality through measurement of chemical contamination, toxicity as determined by laboratory testing, and benthic invertebrate community characteristics; and to determine changes in these parameters over time.

April 2014 sampling will be conducted at the ten usual PSEMP Long-Term monitoring stations. June 2014 PSEMP Regional sampling will be conducted in the Admiralty Inlet region, while Urban Bays sampling will occur in Commencement Bay.

This addendum to the 2009 PSEMP Sediment Monitoring Component Quality Assurance Project Plan (QAPP) (Dutch et al., 2009) provides details about sampling locations, parameters, and sampling/analysis schedules for each of the three 2014 sampling programs. All other quality assurance elements, including sampling methods, quality control, and data management, are as described in Dutch et al., 2009 and remain unchanged for the Long-term, Regional, and Urban Bays sampling programs.

April 2014 – Long-Term Sediment Monitoring

Purpose: To continue monitoring benthic invertebrate community structure and associated sediment quality at ten sentinel monitoring stations representing a variety of habitat types located throughout Puget Sound.

Station Locations: Ten Long-term PSEMP stations located throughout Puget Sound (Figure 1, Table 1).

Parameters Sampled: Field measurements, macroinvertebrate abundance, grain size, total organic carbon (Table 2).

Project Schedule: Outlined in Table 3.

[1] Formerly known as the "Puget Sound Assessment and Monitoring Program (PSAMP)"
[2] Formerly known as "Long-term/Temporal"
[3] Formerly known as "Spatial/Temporal"
[4] An expansion of Ecology's "Urban Waters Initiative"

June 2014 – Regional and Urban Bays Sediment Monitoring

Sampling in June 2014 will be conducted for Ecology's PSEMP Regional and Urban Bays monitoring efforts. A total of seventy stations will be sampled for these two projects, with sampling occurring in the Admiralty Inlet region and in Commencement Bay, respectively. Details are given below.

Regional Monitoring – Admiralty Inlet

Purpose: To characterize sediment quality in the PSEMP Admiralty Inlet sediment monitoring region and to determine change over time.

Station Locations: Forty randomly selected locations in the Admiralty Inlet Sediment Monitoring Region (Figure 2, Table 4). Locations for three additional stations in Port Townsend have also been selected and will be sampled if funding is available. This would provide a subset of thirty random stations in Port Townsend. These data could then be analyzed separately from the region as an additional Urban Bays focus study. Twenty alternate station locations are available in case a station location cannot be sampled (Figure 3, Table 5).

Parameters Sampled: Field measurements, toxicity, macroinvertebrate abundance, grain size, total organic carbon, metals, and organic chemical contaminants (Table 6).

Project Schedule: Outlined in Table 7.

Urban Bays Monitoring – Commencement Bay

Purpose: To characterize current sediment quality in Commencement Bay and to compare these data to 1999 baseline and 2008 data to determine change over time.

Station Locations: Thirty random locations, originally selected and sampled in 1999, will be resampled in Commencement Bay (Figure 4, Table 8). Twenty five alternate station locations are proposed in case a station location cannot be sampled (Figure 5, Table 9).

Parameters Sampled: Field measurements, toxicity, macroinvertebrate abundance, grain size, total organic carbon, metals, and organic chemical contaminants (Table 6).

Project Schedule: Outlined in Table 7.

2014 Budget

The budget for each of the projects is provided in Table 10.

Additional information about the Long-term, Regional, and Urban Bays sediment monitoring programs are found at: www.ecy.wa.gov/programs/eap/sediment/.

Future Sediment Monitoring

Future monitoring locations and sampling dates for the Long-term, Regional, and Urban Bays programs listed above are indicated in the schedule in Table 11.

For further information or comments, contact Maggie Dutch at 360-407-6021 or margaret.dutch@ecy.wa.gov.

Literature Cited

Dutch, M., V. Partridge, S. Weakland, K. Welch, and E. Long. 2009. Quality Assurance Project Plan: The Puget Sound Assessment and Monitoring Program Sediment Monitoring Component. Washington State Department of Ecology Publication 09-03-121. 98 pp.

Figures and Tables

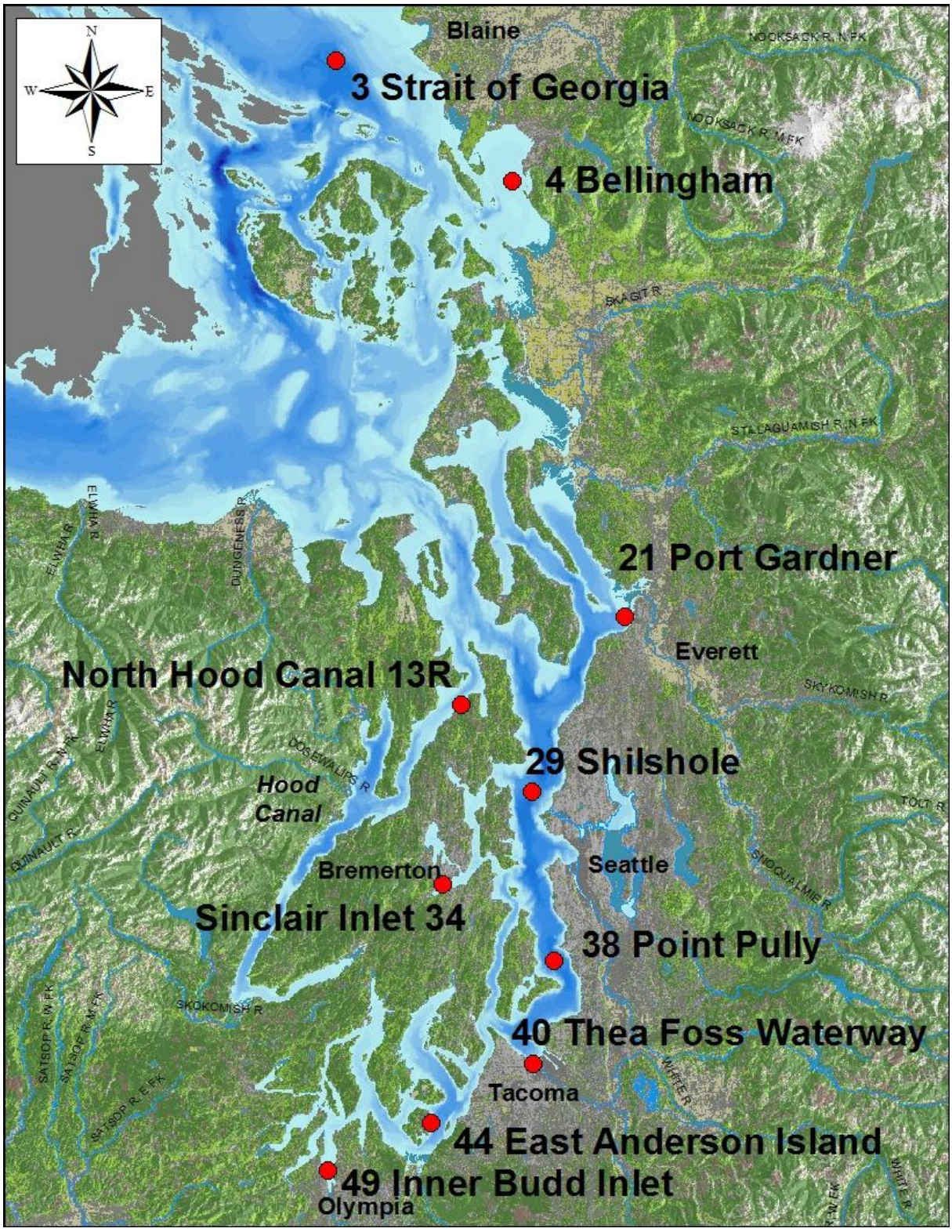

Figure 1. 2014 PSEMP Long-Term Sediment Monitoring Program stations in Puget Sound.

Table 1. Locations (latitude/longitude) for the 2014 PSEMP Long-Term Sediment Monitoring Program stations.

Station	Location	Target (NAD 83, decimal degrees)	
		Latitude	Longitude
3	Strait of Georgia	48.87025	-122.97842
4	Bellingham	48.68397	-122.53820
21	Everett	47.98547	-122.24283
29	Shilshole	47.70075	-122.45403
34	Sinclair Inlet	47.54708	-122.66208
38	Point Pully	47.42833	-122.39363
40	Commencement Bay	47.26130	-122.43730
44	East Anderson Island	47.16133	-122.67358
49	Budd Inlet	47.07997	-122.91347
13R	North Hood Canal	47.83758	-122.62895

Table 2. Parameters measured in sediments for the 2014 PSEMP Long-Term Sediment Monitoring Program.

Field Measurements

Sediment temperature
Salinity of overlying water

Macroinvertebrate Abundance

Total Abundance
Major Taxa Abundance
Taxa Richness
Pielou's Evenness
Swartz's Dominance Index

Related Parameters

Grain size
Total organic carbon

Table 3. Proposed schedule for completing the 2014 PSEMP Long-Term Sediment Monitoring Program field and laboratory work, EIM data entry, and reports.

Field and laboratory work		
Field work completed		April 2014
Laboratory analyses completed		Total Organic Carbon – July 2014 Grain size – September 2014 Taxonomy – March 2015
Environmental Information System (EIM) system		
EIM Study ID: PSAMP_LT		
Product	Due date	Lead Staff
EIM data loaded	April 2015	Sandra Weakland
EIM QA	May 2015	Maggie Dutch
EIM complete	June 2015	Sandra Weakland
Final report: 2015 PSEMP Long-Term Monitoring		
Author lead		Valerie Partridge
Schedule		
Summary statistics, tables and figures generated and posted to web		As it becomes available: July 2014 – March 2015
Draft due to supervisor		Not applicable: PSEMP Long-Term report published every 5th year; next report after 2015 sampling
Draft due to client/peer reviewer		
Draft due to external reviewer		
Final (all reviews done) due to publications coordinator		
Final report due on web		

Figure 2. 2014 PSEMP Regional Monitoring Program – Forty target sediment monitoring stations in the Admiralty Inlet region.

Locations for three additional stations in Port Townsend are also given, pending additional funding.

Table 4. Target locations (latitude/longitude) for Ecology's 2014 PSEMP Regional Monitoring Program – Forty stations in the Admiralty Inlet region.

Locations for three additional stations in Port Townsend are also given, pending additional funding.

STATION	STRATA	LOCATION	Station Location (NAD 83, decimal degrees)	
			LATITUDE	LONGITUDE
Target Stations				
51	Urban	Port Townsend	48.08703	-122.74665
83	Urban	South Port Townsend	48.03590	-122.73901
106	Urban	South Port Townsend	48.04692	-122.76379
107	Urban	South Port Townsend	48.04017	-122.74352
108	Urban	South Port Townsend	48.06980	-122.76533
109	Urban	Port Townsend	48.11082	-122.72876
110	Urban	Port Townsend	48.11500	-122.72402
111	Urban	Port Townsend	48.10293	-122.75001
115	Urban	Port Townsend	48.07414	-122.75433
211	Urban	South Port Townsend	48.05708	-122.74356
331	Urban	South Port Townsend	48.04122	-122.75049
395	Urban	Port Townsend	48.09298	-122.74470
459	Urban	Port Townsend	48.08782	-122.75795
491	Urban	Port Townsend	48.07224	-122.78094
523	Urban	Port Townsend	48.11633	-122.71801
587	Urban	South Port Townsend	48.05826	-122.75355
651	Urban	Port Townsend	48.10907	-122.74260
681	Urban	Port Townsend	48.09958	-122.78419
715	Urban	Port Townsend	48.09378	-122.77678
747	Urban	Port Townsend	48.09374	-122.79092
779	Urban	Port Townsend	48.08072	-122.75165
841	Urban	Port Townsend	48.11856	-122.70000
843	Urban	South Port Townsend	48.06093	-122.75781
873	Urban	Port Townsend	48.12002	-122.71042
907	Urban	Port Townsend	48.10568	-122.75630
971	Urban	Port Townsend	48.08279	-122.77108
1003	Urban	South Port Townsend	48.06337	-122.76926
783	Passage	South Admiralty Inlet	47.94347	-122.48283
1443	Passage	South Admiralty Inlet	47.96579	-122.50916
1571	Passage	South Admiralty Inlet	47.96000	-122.50122

STATION	STRATA	LOCATION	Station Location (NAD 83, decimal degrees)	
			LATITUDE	LONGITUDE
Target Stations				
1807	Passage	South Admiralty Inlet	47.95031	-122.46564
2063	Passage	South Admiralty Inlet	47.92748	-122.44844
2155	Passage	South Admiralty Inlet	48.00681	-122.67887
2319	Passage	South Admiralty Inlet	47.97828	-122.48377
2831	Passage	South Admiralty Inlet	47.96113	-122.48716
2923	Passage	South Admiralty Inlet	47.99932	-122.69079
3147	Passage	South Admiralty Inlet	47.99685	-122.71470
3179	Passage	South Admiralty Inlet	47.99307	-122.68410
3187	Passage	South Admiralty Inlet	47.99923	-122.56672
3203	Passage	South Admiralty Inlet	47.98708	-122.56160
Three additional target stations, pending additional funding				
1035	Urban	Port Townsend	48.11441	-122.70946
1099	Urban	South Port Townsend	48.05709	-122.74259
1163	Urban	Port Townsend	48.11653	-122.73067

Figure 3. 2014 PSEMP Regional Monitoring Program – Twenty alternate stations in the Admiralty Inlet region.

Table 5. Alternate locations (latitude/longitude) for Ecology's 2014 PSEMP Regional Monitoring Program – Twenty stations in the Admiralty Inlet region.

STATION	STRATA	LOCATION	Station Location (NAD 83, decimal degrees)	
			LATITUDE	LONGITUDE
Alternate Stations				
1227	Urban	Port Townsend	48.09172	-122.74250
1259	Urban	Port Townsend	48.09005	-122.78896
1291	Urban	Port Townsend	48.10324	-122.70217
1385	Urban	Port Townsend	48.12270	-122.73301
1419	Urban	Port Townsend	48.09857	-122.75687
1483	Urban	Port Townsend	48.07894	-122.75988
1515	Urban	Port Townsend	48.07015	-122.77175
1547	Urban	Port Townsend	48.11157	-122.71790
1611	Urban	South Port Townsend	48.05199	-122.76208
1675	Urban	Port Townsend	48.10728	-122.70744
3343	Passage	South Admiralty Inlet	47.97606	-122.50084
3855	Passage	South Admiralty Inlet	47.95061	-122.47886
4239	Passage	South Admiralty Inlet	47.94629	-122.45556
4623	Passage	South Admiralty Inlet	47.94501	-122.46297
4879	Passage	South Admiralty Inlet	47.94314	-122.47790
4971	Passage	South Admiralty Inlet	48.01112	-122.70659
5135	Passage	South Admiralty Inlet	47.92764	-122.45539
5235	Passage	South Admiralty Inlet	48.00325	-122.56960
5391	Passage	South Admiralty Inlet	47.97182	-122.48602
5539	Passage	South Admiralty Inlet	47.97574	-122.50805

Table 6. Sediment parameters measured for the 2014 PSEMP Regional and Urban Bays Sediment Monitoring Programs.

Field Measurements

Sediment temperature
Salinity of overlying water

Toxicity Parameters

Amphipod Survival (solid phase)
Urchin Fertilization (porewater)

Macroinvertebrate Abundance

Total Abundance
Major Taxa Abundance
Taxa Richness
Pielou's Evenness
Swartz's Dominance Index

Related Parameters
Grain Size
Total organic carbon

Metals

Priority Pollutant Metals
Arsenic
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Selenium
Silver
Zinc

Element
Tin

Organics

Chlorinated Alkenes
Hexachlorobutadiene

Chlorinated and Nitro-Substituted Phenols
Pentachlorophenol

Chlorinated Aromatic Chemicals
1,2,4-Trichlorobenzene
1,2-Dichlorobenzene
1,3-Dichlorobenzene
1,4-Dichlorobenzene
2-Chloronaphthalene
Hexachlorobenzene

Chlorinated Pesticides
2,4'-DDD
2,4'-DDE
2,4'-DDT
4,4'-DDD
4,4'-DDE
4,4'-DDT
Aldrin
Cis-Chlordane (Alpha-Chlordane)
Dieldrin
Endosulfan I
Endosulfan II
Endosulfan Sulfate
Endrin
Endrin Aldehyde
Endrin Ketone
Gamma-BHC (Lindane)
Heptachlor
Heptachlor Epoxide
Mirex
Oxychlordane
Toxaphene
Trans-Chlordane (Gamma)

Polynuclear Aromatic Hydrocarbons

LPAHs
1,6,7-Trimethylnaphthalene
1-Methylnaphthalene
1-Methylphenanthrene
2,6-Dimethylnaphthalene
2-Methylnaphthalene
2-Methylphenanthrene
Acenaphthene
Acenaphthylene
Anthracene
Biphenyl
Dibenzothiophene
Fluorene
Naphthalene
Phenanthrene
Retene
Calculated values:
total LPAHs

HPAHs
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(e)pyrene
Benzo(g,h,i)perylene
Benzo(k)fluoranthene
Chrysene
Dibenzo(a,h)anthracene
Fluoranthene
Indeno(1,2,3-c,d)pyrene
Perylene
Pyrene
Calculated values:
total HPAH
total Benzofluoranthenes

Miscellaneous Extractable Chemicals
Benzoic Acid
Benzyl Alcohol
Beta-coprostanol
Carbazole
Cholesterol
Dibenzofuran
Isophorone

Organonitrogen Chemicals
Caffeine
N-Nitrosodiphenylamine

Phenols
2,4-Dimethylphenol
2-Methylphenol
4-Methylphenol
Phenol
Phenol, 4-Nonyl-

Phthalate Esters
Bis(2-Ethylhexyl) Phthalate
Butylbenzylphthalate
Diethylphthalate
Dimethylphthalate
Di-N-Butylphthalate
Di-N-Octyl Phthalate

Polybrominated Diphenylethers
PBDE-47
PBDE-49
PBDE-66
PBDE-71
PBDE-99
PBDE-100
PBDE-138
PBDE-153
PBDE-154
PBDE-183
PBDE-184
PBDE-191
PBDE-209

Polychlorinated Biphenyls

Aroclors
PCB-1016
PCB-1221
PCB-1232
PCB-1242
PCB-1248
PCB-1254
PCB-1260
PCB-1262
PCB-1268

Congeners
PCB-8
PCB-18
PCB-28
PCB-44
PCB-52
PCB-66
PCB-77
PCB-101
PCB-105
PCB-118
PCB-126
PCB-128
PCB-138
PCB-153
PCB-169
PCB-170
PCB-180
PCB-187
PCB-195
PCB-206
PCB-209

Added in 2009
Bisphenol A
Tri(2-chloroethyl)phosphate (TCEP)
Triclosan
Triethyl citrate

Table 7. Proposed schedule for completing the field and laboratory work, data entry into EIM, and reports for the 2014 PSEMP Regional and Urban Bays Sediment Monitoring Programs.

Field and laboratory work		
Field work completed		June 2014
Laboratory analyses completed		Total Organic Carbon – July 2014 Grain size – September 2014 Chemistry – March 2015 Toxicity – March 2015 Taxonomy – May 2015
Environmental Information System (EIM) system		
EIM Study ID: PSAMP_SP (Regional); PSAMP_UWI (Urban Bays)		
Product	Due date	Lead Staff
EIM data loaded	July 2015	Sandra Weakland
EIM QA	August 2015	Maggie Dutch
EIM complete	September 2015	Sandra Weakland
Final report: 2014 PSEMP Regional, Urban Bays		
Author lead		Valerie Partridge
Schedule		
Summary statistics, graphics, and text generated and posted to web		August (Regional), September (Urban Bays) 2015
Drafts due to supervisor		September (Regional), October (Urban Bays) 2015
Drafts due to client/peer reviewer		October (Regional), November (Urban Bays) 2015
Drafts due to external reviewers		November (Regional), December (Urban Bays) 2015
Final reports (all reviews done) due to publications coordinator		December 2015 (Regional), January 2016 (Urban Bays)
Final reports due on web		January 2016 (Regional), February 2016 (Urban Bays)

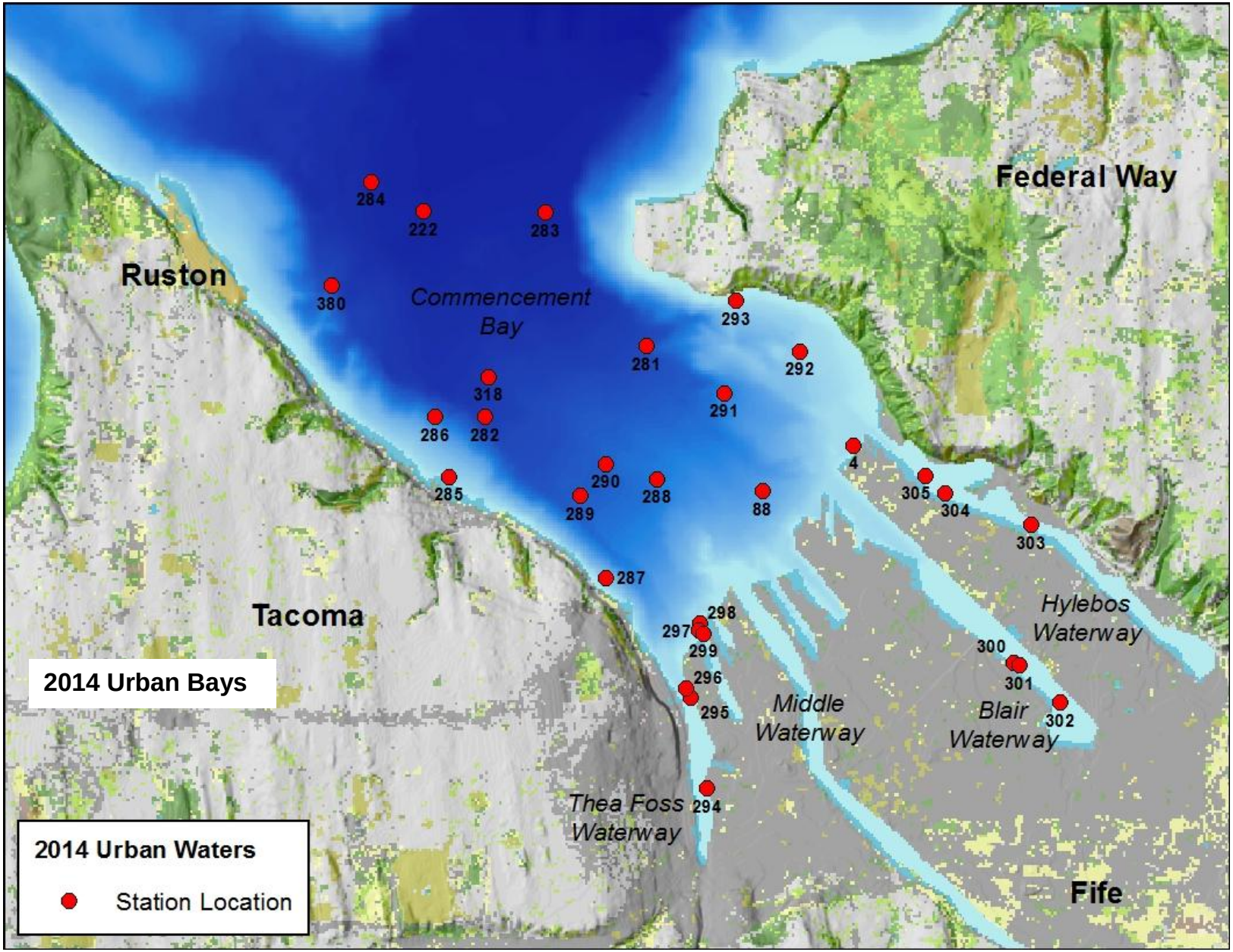

Figure 4. 2014 PSEMP Urban Bays Monitoring Program – Thirty target stations in Commencement Bay.

Table 8. Locations (latitude/longitude) for Ecology's 2014 Urban Bays Monitoring Program – Thirty target stations in Commencement Bay.

STATION	STRATA	LOCATION	Station Location (NAD 83, decimal degrees)	
			LATITUDE	LONGITUDE
Target Stations				
4	Urban	S.E. Commencement Bay	47 16.9836	-122 24.7140
88	Urban	S.E. Commencement Bay	47 16.7010	-122 25.4868
222	Urban	S.E. Commencement Bay	47 18.2964	-122 28.4724
318	Urban	S.E. Commencement Bay	47 17.3334	-122 27.8766
380	Urban	S.E. Commencement Bay	47 17.8470	-122 29.2512
281	Urban	S.E. Commencement Bay	47 17.5372	-122 26.5156
282	Urban	S.E. Commencement Bay	47 17.1003	-122 27.8927
283	Urban	S.E. Commencement Bay	47 18.3070	-122 27.4126
284	Urban	S.E. Commencement Bay	47 18.4631	-122 28.9287
285	Urban	S.E. Commencement Bay	47 16.7425	-122 28.1936
286	Urban	S.E. Commencement Bay	47 17.0923	-122 28.3244
287	Urban	S.E. Commencement Bay	47 16.1733	-122 26.8208
288	Urban	S.E. Commencement Bay	47 16.7600	-122 26.3977
289	Urban	S.E. Commencement Bay	47 16.6480	-122 27.0584
290	Urban	S.E. Commencement Bay	47 16.8400	-122 26.8446
291	Urban	N.E. Commencement Bay	47 17.2721	-122 25.8344
292	Urban	N.E. Commencement Bay	47 17.5280	-122 25.1932
293	Urban	N.E. Commencement Bay	47 17.8160	-122 25.7567
294	Harbor	Thea Foss Waterway	47 14.9497	-122 25.8998
295	Harbor	Thea Foss Waterway	47 15.4829	-122 26.0665
296	Harbor	Thea Foss Waterway	47 15.5314	-122 26.1058
297	Harbor	Middle Waterway	47 15.9167	-122 26.0000
298	Harbor	Middle Waterway	47 15.8750	-122 26.0083
299	Harbor	Middle Waterway	47 15.8583	-122 25.9667
300	Harbor	Blair Waterway	47 15.7304	-122 23.2828
301	Harbor	Blair Waterway	47 15.7179	-122 23.2372
302	Harbor	Blair Waterway	47 15.5052	-122 22.8726
303	Harbor	Hylebos Waterway	47 16.5437	-122 23.1614
304	Harbor	Hylebos Waterway	47 16.7189	-122 23.9059
305	Harbor	Hylebos Waterway	47 16.8190	-122 24.0883

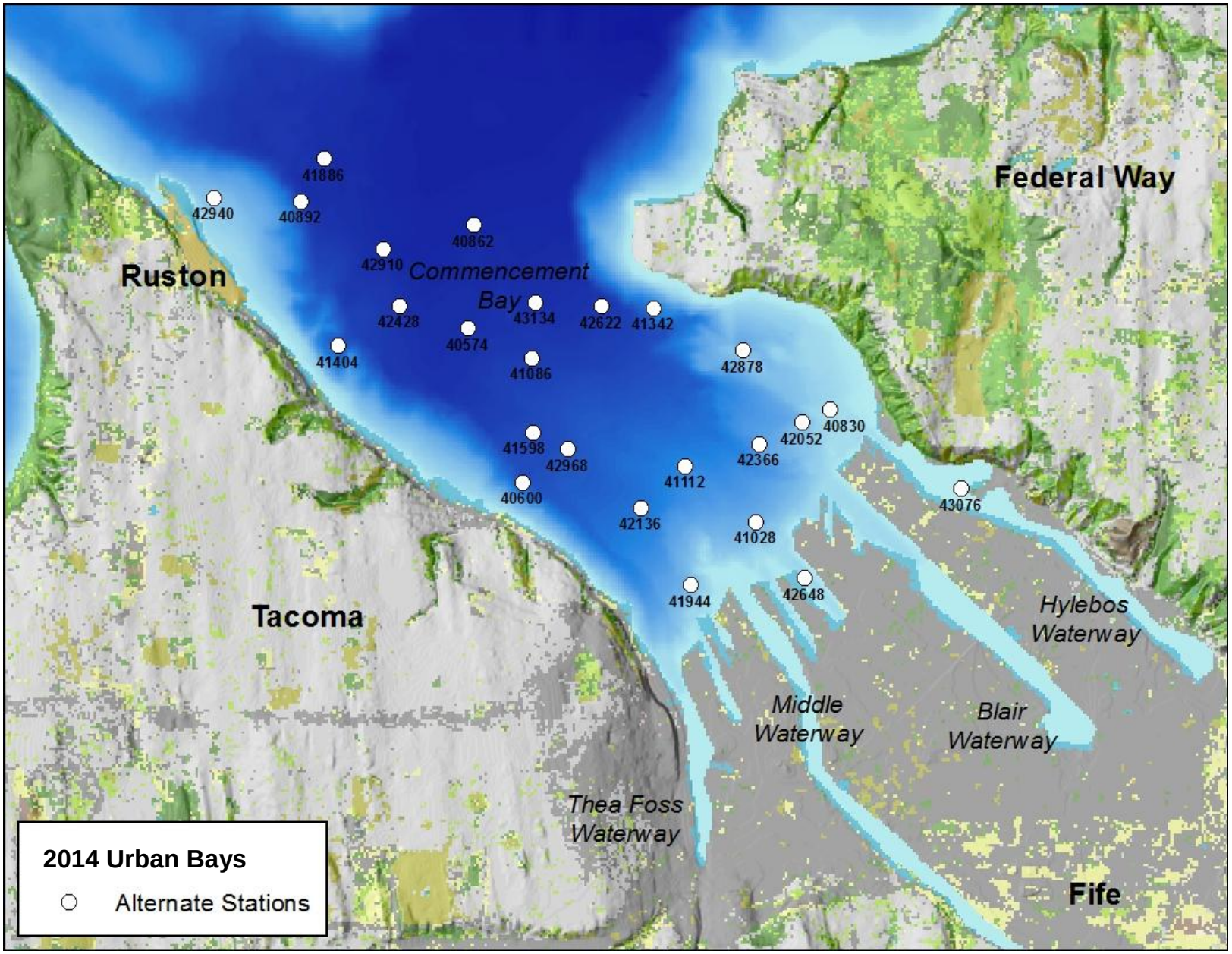

Figure 5. 2014 PSEMP Urban Bays Monitoring Program – Twenty-five alternate stations in Commencement Bays.

Table 9. Alternate locations (latitude/longitude) for Ecology's 2014 Urban Bays Monitoring Program – Twenty-five stations in Commencement Bay.

STATION	Station Location (NAD 83, decimal degrees)	
	LATITUDE	LONGITUDE
Alternate Stations		
40574	47.29369	-122.46756
40600	47.27879	-122.45912
40830	47.28659	-122.41513
40862	47.30381	-122.46706
40892	47.30574	-122.49204
41028	47.27549	-122.42541
41086	47.29095	-122.45829
41112	47.28075	-122.43588
41342	47.29614	-122.44092
41404	47.29168	-122.48623
41598	47.28366	-122.45783
41886	47.30996	-122.48888
41944	47.26913	-122.43457
42052	47.28532	-122.41919
42136	47.27656	-122.44211
42366	47.28309	-122.42531
42428	47.29577	-122.47753
42622	47.29620	-122.44841
42648	47.27008	-122.41820
42878	47.29220	-122.42797
42910	47.30130	-122.48001
42940	47.30588	-122.50464
42968	47.28212	-122.45280
43076	47.27920	-122.39608
43134	47.29642	-122.45791

Table 10. Budget for 2014 Long-term, Regional, and Urban Bays sediment monitoring programs.

Item	Units	Number	$/unit		2014 cost
April PSEMP Long-term					
Total Organic Carbon 104	samples	33	$ 43.60		$ 1,438.80
Research vessel	ship hours	90	$ 160.00		$ 14,400.00
Taxonomy	samples	30	$ 458.00		$ 13,740.00
Grain size	samples	33	$ 80.00		$ 2,640.00
				Total:	**$ 32,218.80**
June PSEMP Regional					
Research Vessel	ship hours	100	$ 160.00		$ 16,000.00
Sample courier	trips	3	$ 425.00		$ 1,275.00
Taxonomy	samples	40	$ 458.00		$ 18,320.00
Grain size	samples	43	$ 80.00		$ 3,440.00
Toxicity					
amphipod - Eohaustorius	samples	40	$ 450.00		$ 18,000.00
urchin fert - porewater	samples	40	$ 450.00		$ 18,000.00
Chemistry					
Total Organic Carbon 104	samples+field dups	43	$ 43.60		$ 1,874.80
Metals	samples+field dups	43	$ 197.00		$ 8,471.00
BNASQS	samples+field dups	43	$ 337.00		$ 14,491.00
PAH	samples+field dups	43	$ 415.00		$ 17,845.00
Pest+aroclors+congeners	samples+field dups	43	$ 348.00		$ 14,964.00
13 PBDEs	samples+field dups	43	$ 190.00		$ 8,170.00
MS/MSD QC	1 ea/batch of 20	4	$ 1,530.60		$ 6,122.40
				Total:	**$ 146,973.20**
June PSEMP Urban Bays					
Research Vessel	ship hours	90	$ 160.00		$ 14,400.00
Sample courier	trips	3	$ 425.00		$ 1,275.00
Taxonomy	samples	30	$ 458.00		$ 13,740.00
Grain size	samples	33	$ 80.00		$ 2,640.00
Toxicity					
amphipod - Eohaustorius	samples	30	$ 450.00		$ 13,500.00
urchin fert - porewater	samples	30	$ 450.00		$ 13,500.00
Chemistry					
Total Organic Carbon 104	samples+field dups	33	$ 43.60		$ 1,438.80
Metals	samples+field dups	33	$ 197.00		$ 6,501.00
BNASQS	samples+field dups	33	$ 337.00		$ 11,121.00
PAH	samples+field dups	33	$ 415.00		$ 13,695.00
Pest+aroclors+congeners	samples+field dups	33	$ 348.00		$ 11,484.00
13 PBDEs	samples+field dups	33	$ 190.00		$ 6,270.00
MS/MSD QC	1 ea/batch of 20	4	$ 1,530.60		$ 6,122.40
				Total:	**$ 115,687.20**

Table 11. Sediment sampling schedule for the PSEMP Regional, Urban Bays, Long-Term, and Focus Study Programs (1997-2026).

	Number of Stations Collected																	Number of Stations Expected													
year sampled:	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Regional Monitoring																														
San Juan Archipelago						90 (81 new +9 old)										40											40			
Eastern Strait of Juan de Fuca																	40											40		
Admiralty Inlet																		43												40
Strait of Georgia and Bellingham	100									40											40									
Whidbey Basin											40											40								
Central Sound (north)		100										30											40							
Central Sound (south)													50											40						
South Sound			100												43										40					
Hood Canal								30												40										
Urban Bays Monitoring																														
Elliott Bay/Lower Duwamish											30						36						30					30		
Commencement Bay												30						30						30						30
Bainbridge Basin, including Sinclair and Dyes Inlets													33						33						33					
Bellingham Bay														30						30						30				
Budd Inlet															30						30						30			
Everett Harbor/Port Gardner																30						30						30		
Long Term Monitoring*	10	10	10	10+	10	10	10	10	10+	10	10	10	10	10+	10	10	10	10	10+	10	10	10	10	10+	10	10	10	10	10+	10
Focus Study/Special Projects														40[1]			30[2]													

* Grain Size/Total Organic Carbon/Benthos collected in triplicate

10+ = Grain Size/Total Organic Carbon/Benthos/Chemistry collected in triplicate

Focus Studies:

40[1] = 2010 - Pharmaceuticals and Personal Care Products, Perfluorinated Chemicals at 10 Long-term stations and at 30 Bellingham Bay stations.
30[2] = 2013 - Pharmaceuticals and Personal Care Products, Perfluorinated Chemicals at 30 Elliott Bay Stations.