

APPENDIX N

STATISTICAL ANALYSES

Supplemental Figures

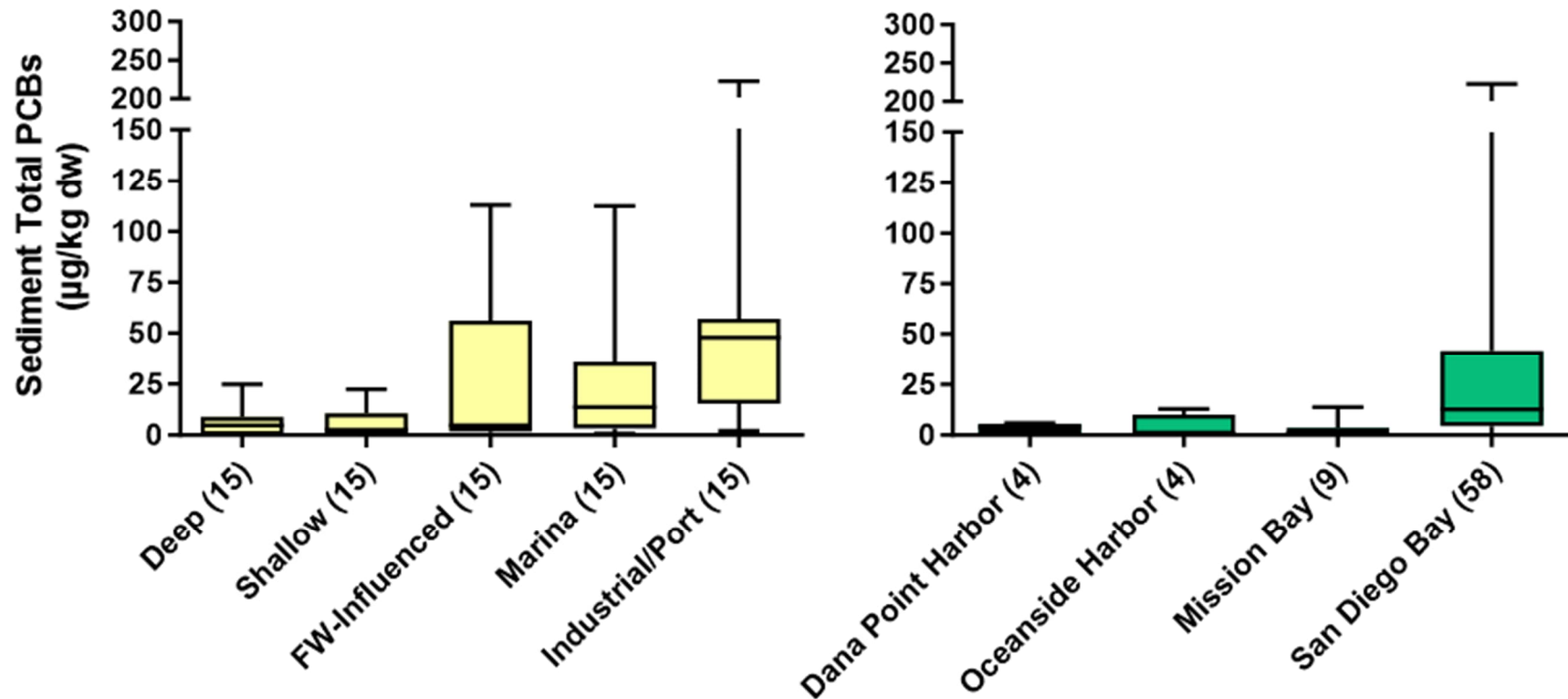


Figure N-1. Comparisons of Sediment Total PCB Concentrations Among Strata and Harbors

Box plots show the median, quartiles, and range of values. The number of stations (n) is shown in parentheses.

Total PCBs include all reported congeners (PCB-3, 5, 8, 15, 18, 27, 28, 29, 31, 33, 37, 44, 49, 52, 56(60), 66, 70, 74, 77, 81, 87, 95, 97, 99, 101, 105, 110, 114, 118, 119, 123, 126, 128, 137, 138, 141, 149, 151, 153, 156, 157, 158, 167, 168+132, 169, 170, 174, 177, 180, 183, 187, 189, 194, 195, 199(200), 201, 203, 206, and 209). Note that this list is a subset of the total 209 PCB congeners.

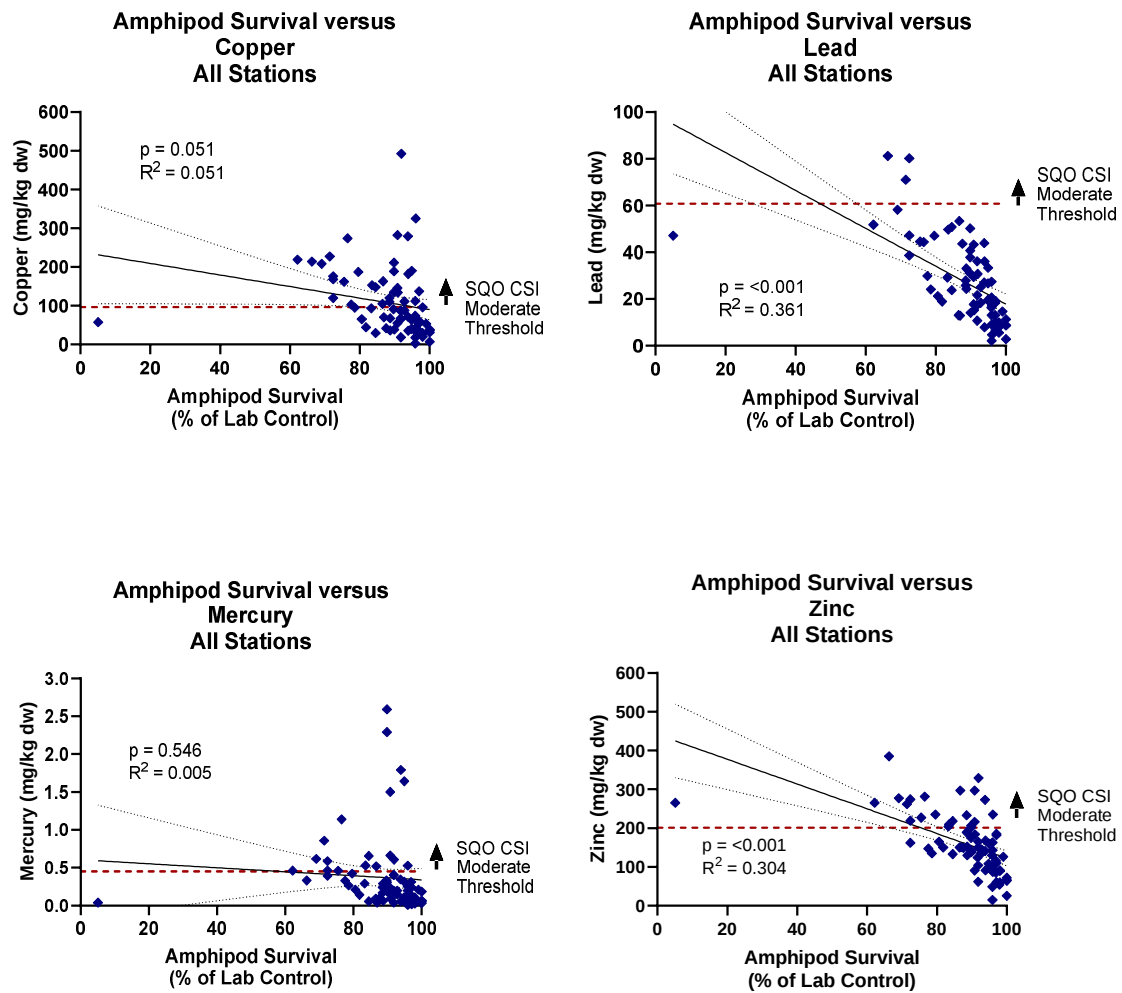


Figure N-2. Linear Regression Analyses Between Amphipod Survival and Select Trace Metal Concentrations

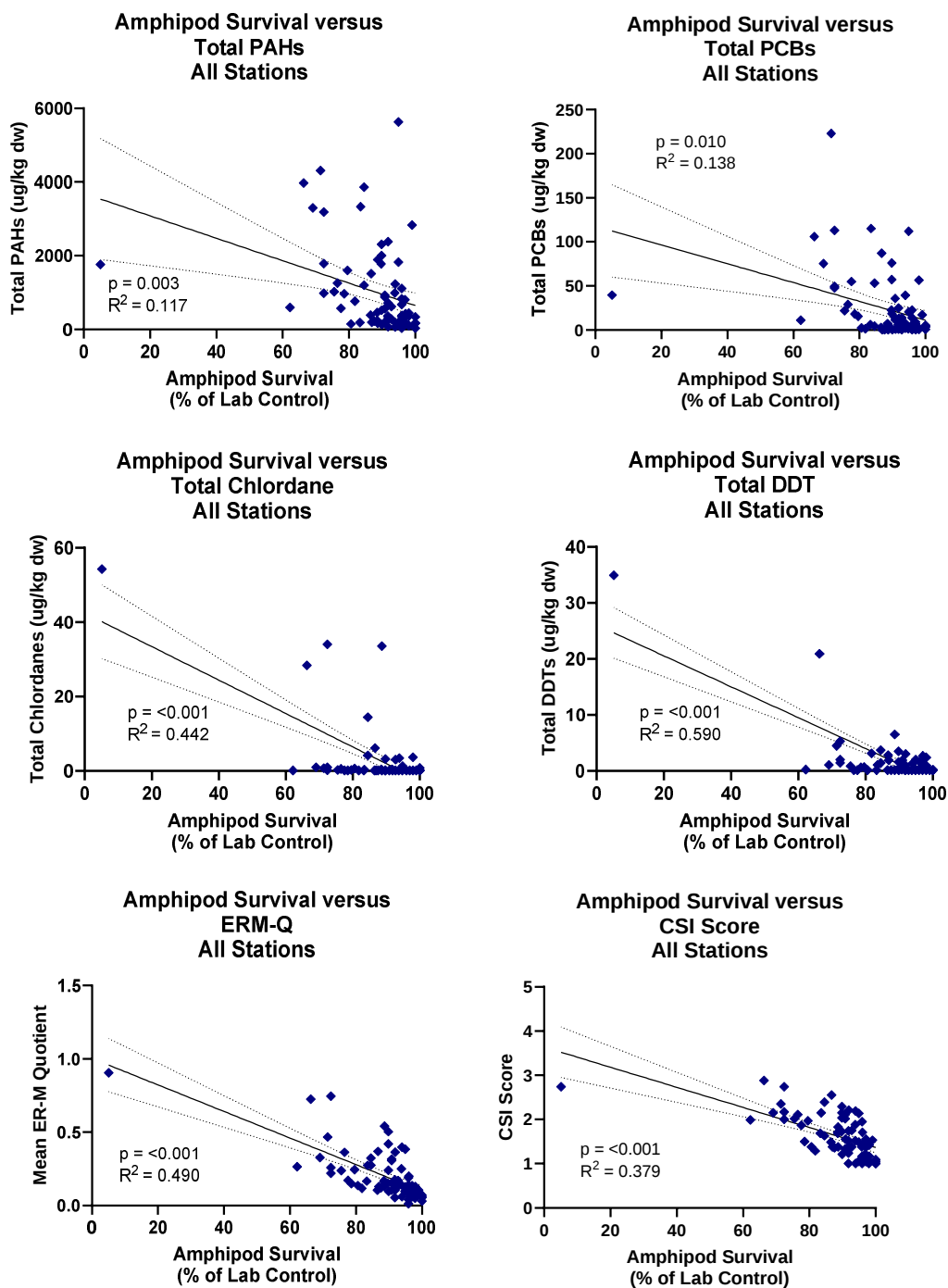


Figure N-3. Linear Regression Analyses Between Amphipod Survival, Select Organic Constituents, and Integrated ER-M Quotient and SQO CSI Scores

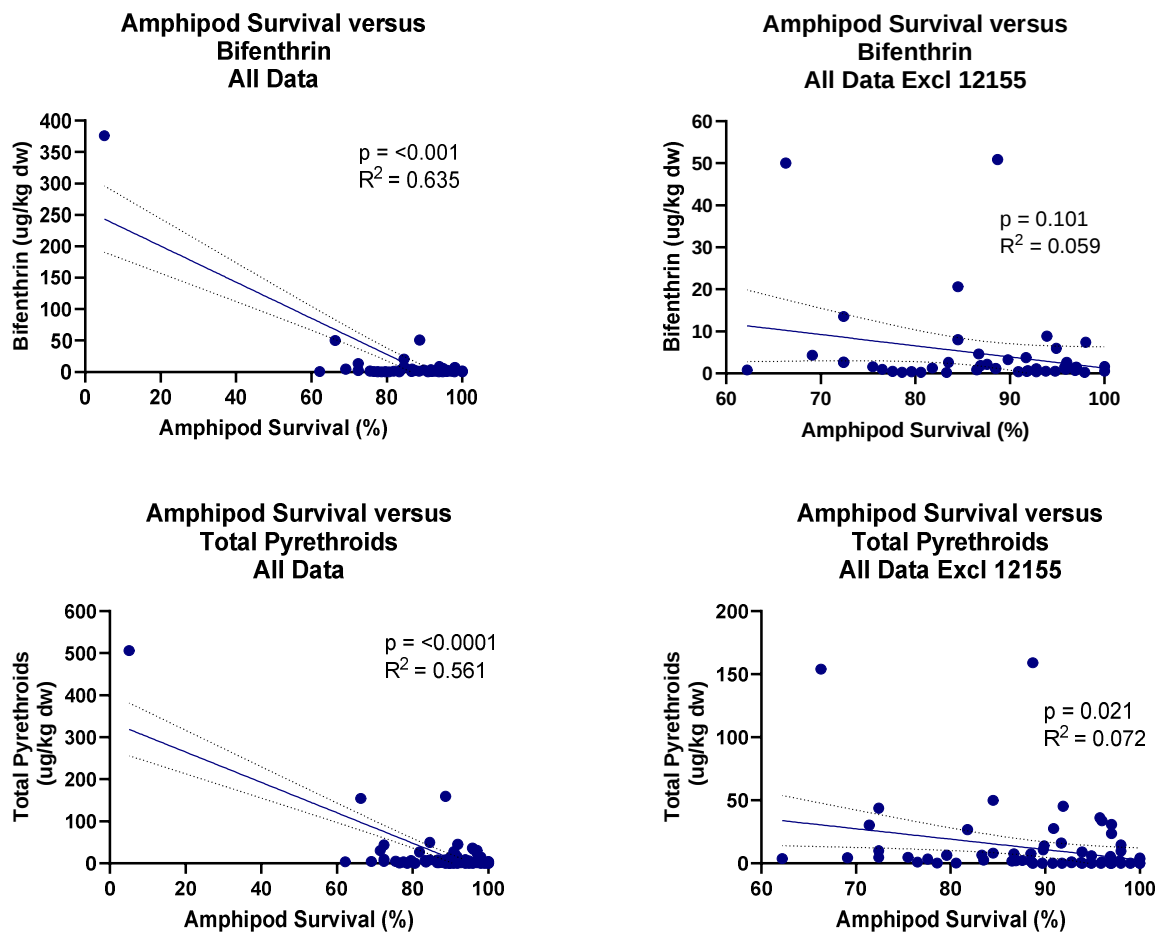


Figure N-4. Linear Regression Analyses Between Amphipod Survival, Total Pyrethroids, and Bifenthrin

Statistical Comparisons for Chemistry and Indices by Strata (2023 Only)

Water Column Dissolved Copper (untransformed) – Kruskal-Wallis with Dunn's Multiple Comparisons Test

Kruskal-Wallis test

P value	<0.0001
Exact or approximate P value?	Approximate
P value summary	****
Do the medians vary signif. (P < 0.05)?	Yes
Number of groups	5
Kruskal-Wallis statistic	27.77

Data summary

Number of treatments (columns)	5
Number of values (total)	75

Dunn's multiple comparisons test	Mean rank diff.	Significant?	Summary	Adjusted P Value
Deep (15) vs. Shallow (15)	-5.200	No	ns	>0.9999
Deep (15) vs. FW-Influenced (15)	-10.53	No	ns	>0.9999
Deep (15) vs. Marina (15)	-37.87	Yes	****	<0.0001
Deep (15) vs. Industrial/Port (15)	-19.07	No	ns	0.1658
Shallow (15) vs. FW-Influenced (15)	-5.333	No	ns	>0.9999
Shallow (15) vs. Marina (15)	-32.67	Yes	***	0.0004
Shallow (15) vs. Industrial/Port (15)	-13.87	No	ns	0.8143
FW-Influenced (15) vs. Marina (15)	-27.33	Yes	**	0.0059
FW-Influenced (15) vs. Industrial/Port (15)	-8.533	No	ns	>0.9999
Marina (15) vs. Industrial/Port (15)	18.80	No	ns	0.1816

Water Column Total PAHs (log transformed) – One-way ANOVA

ANOVA summary

F	0.5103
P value	0.7283
P value summary	ns
Significant diff. among means ($P < 0.05$)?	No
R squared	0.02833

Data summary

Number of treatments (columns)	5
Number of values (total)	75

Sediment Arsenic (untransformed) – One-way ANOVA with Tukey's Multiple Comparisons Test

ANOVA summary

F	3.346
P value	0.0145
P value summary	*
Significant diff. among means (P < 0.05)?	Yes
R squared	0.1605

Data summary

Number of treatments (columns)	5
Number of values (total)	75

Tukey's multiple comparisons test	Mean Diff.	95.00% CI of diff.	Significant?	Summary	Adjusted P Value
Deep (15) vs. Shallow (15)	-2.157	-4.815 to 0.5013	No	ns	0.1664
Deep (15) vs. FW-Influenced (15)	-1.963	-4.621 to 0.6953	No	ns	0.2457
Deep (15) vs. Marina (15)	-3.167	-5.825 to -0.5093	Yes	*	0.0115
Deep (15) vs. Industrial/Port (15)	-2.801	-5.459 to -0.1433	Yes	*	0.0338
Shallow (15) vs. FW-Influenced (15)	0.1940	-2.464 to 2.852	No	ns	0.9996
Shallow (15) vs. Marina (15)	-1.011	-3.669 to 1.647	No	ns	0.8238
Shallow (15) vs. Industrial/Port (15)	-0.6447	-3.303 to 2.013	No	ns	0.9603
FW-Influenced (15) vs. Marina (15)	-1.205	-3.863 to 1.453	No	ns	0.7108
FW-Influenced (15) vs. Industrial/Port (15)	-0.8387	-3.497 to 1.819	No	ns	0.9021
Marina (15) vs. Industrial/Port (15)	0.3660	-2.292 to 3.024	No	ns	0.9952

Sediment Cadmium (untransformed) – One-way ANOVA

ANOVA summary

F	2.315
P value	0.0658
P value summary	ns
Significant diff. among means ($P < 0.05$)?	No
R squared	0.1168

Data summary

Number of treatments (columns)	5
Number of values (total)	75

Sediment Chromium (untransformed) – One-way ANOVA with Tukey's Multiple Comparisons Test

ANOVA summary

F	5.326
P value	0.0008
P value summary	***
Significant diff. among means (P < 0.05)?	Yes
R squared	0.2333

Data summary

Number of treatments (columns)	5
Number of values (total)	75

Tukey's multiple comparisons test	Mean Diff.	95.00% CI of diff.	Significant?	Summary	Adjusted P Value
Deep (15) vs. Shallow (15)	-8.679	-22.65 to 5.292	No	ns	0.4169
Deep (15) vs. FW-Influenced (15)	-6.553	-20.52 to 7.418	No	ns	0.6839
Deep (15) vs. Marina (15)	-16.43	-30.40 to -2.455	Yes	*	0.0131
Deep (15) vs. Industrial/Port (15)	-20.55	-34.52 to -6.575	Yes	***	0.0010
Shallow (15) vs. FW-Influenced (15)	2.127	-11.84 to 16.10	No	ns	0.9930
Shallow (15) vs. Marina (15)	-7.747	-21.72 to 6.224	No	ns	0.5324
Shallow (15) vs. Industrial/Port (15)	-11.87	-25.84 to 2.104	No	ns	0.1334
FW-Influenced (15) vs. Marina (15)	-9.873	-23.84 to 4.098	No	ns	0.2870
FW-Influenced (15) vs. Industrial/Port (15)	-13.99	-27.96 to -0.02241	Yes	*	0.0494
Marina (15) vs. Industrial/Port (15)	-4.120	-18.09 to 9.851	No	ns	0.9218

Sediment Copper (untransformed) – Welch's ANOVA with Dunnett's T3 Multiple Comparisons Test

Welch's ANOVA test

W (DFn, DFd)	12.31 (4.000, 33.64)
P value	<0.0001
P value summary	****
Significant diff. among means (P < 0.05)?	Yes
Welch's ANOVA test	
W (DFn, DFd)	12.31 (4.000, 33.64)

Data summary

Number of treatments (columns)	5
Number of values (total)	75

Dunnett's T3 multiple comparisons test	Mean Diff.	95.00% CI of diff.	Below threshold?	Summary	Adjusted P Value
Deep (15) vs. Shallow (15)	-13.60	-45.77 to 18.57	No	ns	0.8831
Deep (15) vs. FW-Influenced (15)	-33.22	-88.35 to 21.90	No	ns	0.4952
Deep (15) vs. Marina (15)	-153.7	-251.5 to -55.94	Yes	**	0.0012
Deep (15) vs. Industrial/Port (15)	-92.44	-144.4 to -40.48	Yes	***	0.0002
Shallow (15) vs. FW-Influenced (15)	-19.62	-74.07 to 34.83	No	ns	0.9395
Shallow (15) vs. Marina (15)	-140.1	-237.5 to -42.73	Yes	**	0.0028
Shallow (15) vs. Industrial/Port (15)	-78.84	-130.4 to -27.32	Yes	**	0.0012
FW-Influenced (15) vs. Marina (15)	-120.5	-224.5 to -16.49	Yes	*	0.0164
FW-Influenced (15) vs. Industrial/Port (15)	-59.22	-124.9 to 6.508	No	ns	0.0997
Marina (15) vs. Industrial/Port (15)	61.29	-41.24 to 163.8	No	ns	0.5108

Sediment Lead (untransformed) – One-way ANOVA with Tukey’s Multiple Comparisons Test

ANOVA summary

F	5.749
P value	0.0005
P value summary	***
Significant diff. among means (P < 0.05)?	Yes
R squared	0.2473

Data summary

Number of treatments (columns)	5
Number of values (total)	75

Tukey's multiple comparisons test	Mean Diff.	95.00% CI of diff.	Significant?	Summary	Adjusted P Value
Deep (15) vs. Shallow (15)	-8.015	-24.14 to 8.107	No	ns	0.6347
Deep (15) vs. FW-Influenced (15)	-15.49	-31.61 to 0.6341	No	ns	0.0656
Deep (15) vs. Marina (15)	-13.81	-29.93 to 2.311	No	ns	0.1278
Deep (15) vs. Industrial/Port (15)	-26.45	-42.57 to -10.32	Yes	***	0.0002
Shallow (15) vs. FW-Influenced (15)	-7.473	-23.59 to 8.649	No	ns	0.6934
Shallow (15) vs. Marina (15)	-5.796	-21.92 to 10.33	No	ns	0.8515
Shallow (15) vs. Industrial/Port (15)	-18.43	-34.55 to -2.309	Yes	*	0.0170
FW-Influenced (15) vs. Marina (15)	1.677	-14.45 to 17.80	No	ns	0.9984
FW-Influenced (15) vs. Industrial/Port (15)	-10.96	-27.08 to 5.164	No	ns	0.3253
Marina (15) vs. Industrial/Port (15)	-12.63	-28.76 to 3.487	No	ns	0.1939

Sediment Mercury (untransformed) – Kruskal-Wallis with Dunn’s Multiple Comparisons Test

Kruskal-Wallis test

P value	0.0008
Exact or approximate P value?	Approximate
P value summary	***
Do the medians vary signif. (P < 0.05)?	Yes
Number of groups	5
Kruskal-Wallis statistic	18.94

Data summary

Number of treatments (columns)	5
Number of values (total)	75

Dunn's multiple comparisons test	Mean rank diff.	Significant?	Summary	Adjusted P Value
Deep (15) vs. Shallow (15)	-9.167	No	ns	>0.9999
Deep (15) vs. FW-Influenced (15)	1.400	No	ns	>0.9999
Deep (15) vs. Marina (15)	-20.57	No	ns	0.0976
Deep (15) vs. Industrial/Port (15)	-26.17	Yes	*	0.0101
Shallow (15) vs. FW-Influenced (15)	10.57	No	ns	>0.9999
Shallow (15) vs. Marina (15)	-11.40	No	ns	>0.9999
Shallow (15) vs. Industrial/Port (15)	-17.00	No	ns	0.3266
FW-Influenced (15) vs. Marina (15)	-21.97	No	ns	0.0578
FW-Influenced (15) vs. Industrial/Port (15)	-27.57	Yes	**	0.0053
Marina (15) vs. Industrial/Port (15)	-5.600	No	ns	>0.9999

Sediment Nickel (untransformed) – One-way ANOVA with Tukey's Multiple Comparisons Test

ANOVA summary

F	2.780
P value	0.0333
P value summary	*
Significant diff. among means (P < 0.05)?	Yes
R squared	0.1371

Data summary

Number of treatments (columns)	5
Number of values (total)	75

Tukey's multiple comparisons test	Mean Diff.	95.00% CI of diff.	Significant?	Summary	Adjusted P Value
Deep (15) vs. Shallow (15)	-1.821	-6.689 to 3.047	No	ns	0.8324
Deep (15) vs. FW-Influenced (15)	-2.981	-7.849 to 1.887	No	ns	0.4319
Deep (15) vs. Marina (15)	-5.043	-9.911 to -0.1748	Yes	*	0.0386
Deep (15) vs. Industrial/Port (15)	-4.523	-9.391 to 0.3445	No	ns	0.0810
Shallow (15) vs. FW-Influenced (15)	-1.160	-6.028 to 3.708	No	ns	0.9627
Shallow (15) vs. Marina (15)	-3.222	-8.090 to 1.646	No	ns	0.3520
Shallow (15) vs. Industrial/Port (15)	-2.703	-7.571 to 2.165	No	ns	0.5311
FW-Influenced (15) vs. Marina (15)	-2.062	-6.930 to 2.806	No	ns	0.7592
FW-Influenced (15) vs. Industrial/Port (15)	-1.543	-6.411 to 3.325	No	ns	0.9006
Marina (15) vs. Industrial/Port (15)	0.5193	-4.349 to 5.387	No	ns	0.9982

Sediment Zinc (untransformed) – One-way ANOVA with Tukey's Multiple Comparisons Test

ANOVA summary

F	6.524
P value	0.0002
P value summary	***
Significant diff. among means (P < 0.05)?	Yes
R squared	0.2716

Data summary

Number of treatments (columns)	5
Number of values (total)	75

Tukey's multiple comparisons test	Mean Diff.	95.00% CI of diff.	Significant?	Summary	Adjusted P Value
Deep (15) vs. Shallow (15)	-53.15	-121.0 to 14.74	No	ns	0.1947
Deep (15) vs. FW-Influenced (15)	-81.83	-149.7 to -13.94	Yes	*	0.0103
Deep (15) vs. Marina (15)	-109.9	-177.8 to -42.00	Yes	***	0.0002
Deep (15) vs. Industrial/Port (15)	-97.69	-165.6 to -29.80	Yes	**	0.0013
Shallow (15) vs. FW-Influenced (15)	-28.67	-96.56 to 39.22	No	ns	0.7612
Shallow (15) vs. Marina (15)	-56.73	-124.6 to 11.16	No	ns	0.1447
Shallow (15) vs. Industrial/Port (15)	-44.54	-112.4 to 23.35	No	ns	0.3610
FW-Influenced (15) vs. Marina (15)	-28.06	-95.95 to 39.83	No	ns	0.7753
FW-Influenced (15) vs. Industrial/Port (15)	-15.87	-83.76 to 52.02	No	ns	0.9653
Marina (15) vs. Industrial/Port (15)	12.19	-55.70 to 80.08	No	ns	0.9868

Sediment Total PAHs (untransformed) – Kruskal-Wallis with Dunn’s Multiple Comparisons Test

Kruskal-Wallis test

P value	0.0014
Exact or approximate P value?	Approximate
P value summary	**
Do the medians vary signif. (P < 0.05)?	Yes
Number of groups	5
Kruskal-Wallis statistic	17.75

Data summary

Number of treatments (columns)	5
Number of values (total)	75

Dunn's multiple comparisons test	Mean rank diff.	Significant?	Summary	Adjusted P Value
Deep (15) vs. Shallow (15)	9.100	No	ns	>0.9999
Deep (15) vs. FW-Influenced (15)	-7.600	No	ns	>0.9999
Deep (15) vs. Marina (15)	-9.500	No	ns	>0.9999
Deep (15) vs. Industrial/Port (15)	-22.83	Yes	*	0.0412
Shallow (15) vs. FW-Influenced (15)	-16.70	No	ns	0.3586
Shallow (15) vs. Marina (15)	-18.60	No	ns	0.1943
Shallow (15) vs. Industrial/Port (15)	-31.93	Yes	***	0.0006
FW-Influenced (15) vs. Marina (15)	-1.900	No	ns	>0.9999
FW-Influenced (15) vs. Industrial/Port (15)	-15.23	No	ns	0.5560
Marina (15) vs. Industrial/Port (15)	-13.33	No	ns	0.9385

Sediment Total SQO LPAHs (untransformed) – Kruskal-Wallis with Dunn's Multiple Comparisons Test

Kruskal-Wallis test

P value	0.0157
Exact or approximate P value?	Approximate
P value summary	*
Do the medians vary signif. (P < 0.05)?	Yes
Number of groups	5
Kruskal-Wallis statistic	12.23

Data summary

Number of treatments (columns)	5
Number of values (total)	75

Dunn's multiple comparisons test	Mean rank diff.	Significant?	Summary	Adjusted P Value
Deep (15) vs. Shallow (15)	11.07	No	ns	>0.9999
Deep (15) vs. FW-Influenced (15)	-5.533	No	ns	>0.9999
Deep (15) vs. Marina (15)	-2.333	No	ns	>0.9999
Deep (15) vs. Industrial/Port (15)	-16.20	No	ns	0.4178
Shallow (15) vs. FW-Influenced (15)	-16.60	No	ns	0.3698
Shallow (15) vs. Marina (15)	-13.40	No	ns	0.9221
Shallow (15) vs. Industrial/Port (15)	-27.27	Yes	**	0.0061
FW-Influenced (15) vs. Marina (15)	3.200	No	ns	>0.9999
FW-Influenced (15) vs. Industrial/Port (15)	-10.67	No	ns	>0.9999
Marina (15) vs. Industrial/Port (15)	-13.87	No	ns	0.8143

Sediment Total SQO HPAHs (untransformed) – Kruskal-Wallis with Dunn's Multiple Comparisons Test

Kruskal-Wallis test

P value	0.0029
Exact or approximate P value?	Approximate
P value summary	**
Do the medians vary signif. (P < 0.05)?	Yes
Number of groups	5
Kruskal-Wallis statistic	16.05

Data summary

Number of treatments (columns)	5
Number of values (total)	75

Dunn's multiple comparisons test	Mean rank diff.	Significant?	Summary	Adjusted P Value
Deep (15) vs. Shallow (15)	10.80	No	ns	>0.9999
Deep (15) vs. FW-Influenced (15)	-6.000	No	ns	>0.9999
Deep (15) vs. Marina (15)	-8.200	No	ns	>0.9999
Deep (15) vs. Industrial/Port (15)	-19.93	No	ns	0.1225
Shallow (15) vs. FW-Influenced (15)	-16.80	No	ns	0.3477
Shallow (15) vs. Marina (15)	-19.00	No	ns	0.1696
Shallow (15) vs. Industrial/Port (15)	-30.73	Yes	**	0.0011
FW-Influenced (15) vs. Marina (15)	-2.200	No	ns	>0.9999
FW-Influenced (15) vs. Industrial/Port (15)	-13.93	No	ns	0.7998
Marina (15) vs. Industrial/Port (15)	-11.73	No	ns	>0.9999

Sediment alpha-Chlordane (untransformed) – Kruskal-Wallis with Dunn’s Multiple Comparisons Test

Kruskal-Wallis test

P value	0.0166
Exact or approximate P value?	Approximate
P value summary	*
Do the medians vary signif. (P < 0.05)?	Yes
Number of groups	5
Kruskal-Wallis statistic	12.10

Data summary

Number of treatments (columns)	5
Number of values (total)	75

Dunn's multiple comparisons test	Mean rank diff.	Significant?	Summary	Adjusted P Value
Deep (15) vs. Shallow (15)	2.533	No	ns	>0.9999
Deep (15) vs. FW-Influenced (15)	-14.87	No	ns	0.1263
Deep (15) vs. Marina (15)	0.5333	No	ns	>0.9999
Deep (15) vs. Industrial/Port (15)	-8.200	No	ns	>0.9999
Shallow (15) vs. FW-Influenced (15)	-17.40	Yes	*	0.0351
Shallow (15) vs. Marina (15)	-2.000	No	ns	>0.9999
Shallow (15) vs. Industrial/Port (15)	-10.73	No	ns	0.7177
FW-Influenced (15) vs. Marina (15)	15.40	No	ns	0.0978
FW-Influenced (15) vs. Industrial/Port (15)	6.667	No	ns	>0.9999
Marina (15) vs. Industrial/Port (15)	-8.733	No	ns	>0.9999

Sediment gamma-Chlordane (untransformed) – Kruskal-Wallis with Dunn's Multiple Comparisons Test

Kruskal-Wallis test

P value	0.0022
Exact or approximate P value?	Approximate
P value summary	**
Do the medians vary signif. (P < 0.05)?	Yes
Number of groups	5
Kruskal-Wallis statistic	16.74

Data summary

Number of treatments (columns)	5
Number of values (total)	75

Dunn's multiple comparisons test	Mean rank diff.	Significant?	Summary	Adjusted P Value
Deep (15) vs. Shallow (15)	-2.267	No	ns	>0.9999
Deep (15) vs. FW-Influenced (15)	-19.87	Yes	**	0.0086
Deep (15) vs. Marina (15)	-6.900	No	ns	>0.9999
Deep (15) vs. Industrial/Port (15)	-15.97	No	ns	0.0740
Shallow (15) vs. FW-Influenced (15)	-17.60	Yes	*	0.0315
Shallow (15) vs. Marina (15)	-4.633	No	ns	>0.9999
Shallow (15) vs. Industrial/Port (15)	-13.70	No	ns	0.2155
FW-Influenced (15) vs. Marina (15)	12.97	No	ns	0.2961
FW-Influenced (15) vs. Industrial/Port (15)	3.900	No	ns	>0.9999
Marina (15) vs. Industrial/Port (15)	-9.067	No	ns	>0.9999

Sediment Total DDEs (untransformed) – Kruskal-Wallis with Dunn’s Multiple Comparisons Test

Kruskal-Wallis test

P value	0.0010
Exact or approximate P value?	Approximate
P value summary	***
Do the medians vary signif. (P < 0.05)?	Yes
Number of groups	5
Kruskal-Wallis statistic	18.55

Data summary

Number of treatments (columns)	5
Number of values (total)	75

Dunn's multiple comparisons test	Mean rank diff.	Significant?	Summary	Adjusted P Value
Deep (15) vs. Shallow (15)	6.433	No	ns	>0.9999
Deep (15) vs. FW-Influenced (15)	-19.60	No	ns	0.1033
Deep (15) vs. Marina (15)	-15.93	No	ns	0.3710
Deep (15) vs. Industrial/Port (15)	-16.90	No	ns	0.2702
Shallow (15) vs. FW-Influenced (15)	-26.03	Yes	**	0.0066
Shallow (15) vs. Marina (15)	-22.37	Yes	*	0.0343
Shallow (15) vs. Industrial/Port (15)	-23.33	Yes	*	0.0227
FW-Influenced (15) vs. Marina (15)	3.667	No	ns	>0.9999
FW-Influenced (15) vs. Industrial/Port (15)	2.700	No	ns	>0.9999
Marina (15) vs. Industrial/Port (15)	-0.9667	No	ns	>0.9999

Sediment Total SQO PCBs (untransformed) – Kruskal-Wallis with Dunn's Multiple Comparisons Test

Kruskal-Wallis test

P value	0.0007
Exact or approximate P value?	Approximate
P value summary	***
Do the medians vary signif. (P < 0.05)?	Yes
Number of groups	5
Kruskal-Wallis statistic	19.20

Data summary

Number of treatments (columns)	5
Number of values (total)	75

Dunn's multiple comparisons test	Mean rank diff.	Significant?	Summary	Adjusted P Value
Deep (15) vs. Shallow (15)	-2.433	No	ns	>0.9999
Deep (15) vs. FW-Influenced (15)	-12.50	No	ns	>0.9999
Deep (15) vs. Marina (15)	-15.83	No	ns	0.4651
Deep (15) vs. Industrial/Port (15)	-30.90	Yes	**	0.0010
Shallow (15) vs. FW-Influenced (15)	-10.07	No	ns	>0.9999
Shallow (15) vs. Marina (15)	-13.40	No	ns	0.9202
Shallow (15) vs. Industrial/Port (15)	-28.47	Yes	**	0.0034
FW-Influenced (15) vs. Marina (15)	-3.333	No	ns	>0.9999
FW-Influenced (15) vs. Industrial/Port (15)	-18.40	No	ns	0.2070
Marina (15) vs. Industrial/Port (15)	-15.07	No	ns	0.5817

Sediment Total Pyrethroids (untransformed) – Kruskal-Wallis with Dunn's Multiple Comparisons Test

Kruskal-Wallis test

P value	<0.0001
Exact or approximate P value?	Approximate
P value summary	****
Do the medians vary signif. (P < 0.05)?	Yes
Number of groups	5
Kruskal-Wallis statistic	27.95

Data summary

Number of treatments (columns)	5
Number of values (total)	75

Dunn's multiple comparisons test	Mean rank diff.	Significant?	Summary	Adjusted P Value
Deep (15) vs. Shallow (15)	-8.300	No	ns	>0.9999
Deep (15) vs. FW-Influenced (15)	-38.33	Yes	****	<0.0001
Deep (15) vs. Marina (15)	-19.20	No	ns	0.1436
Deep (15) vs. Industrial/Port (15)	-23.17	Yes	*	0.0314
Shallow (15) vs. FW-Influenced (15)	-30.03	Yes	**	0.0013
Shallow (15) vs. Marina (15)	-10.90	No	ns	>0.9999
Shallow (15) vs. Industrial/Port (15)	-14.87	No	ns	0.5801
FW-Influenced (15) vs. Marina (15)	19.13	No	ns	0.1470
FW-Influenced (15) vs. Industrial/Port (15)	15.17	No	ns	0.5313
Marina (15) vs. Industrial/Port (15)	-3.967	No	ns	>0.9999

Sediment Total PBDEs (untransformed) – Kruskal-Wallis with Dunn's Multiple Comparisons Test

Kruskal-Wallis test

P value	0.0005
Exact or approximate P value?	Approximate
P value summary	***
Do the medians vary signif. (P < 0.05)?	Yes
Number of groups	5
Kruskal-Wallis statistic	20.13

Data summary

Number of treatments (columns)	5
Number of values (total)	75

Dunn's multiple comparisons test	Mean rank diff.	Significant?	Summary	Adjusted P Value
Deep (15) vs. Shallow (15)	-12.03	No	ns	>0.9999
Deep (15) vs. FW-Influenced (15)	-22.07	Yes	*	0.0344
Deep (15) vs. Marina (15)	-0.7333	No	ns	>0.9999
Deep (15) vs. Industrial/Port (15)	-26.17	Yes	**	0.0052
Shallow (15) vs. FW-Influenced (15)	-10.03	No	ns	>0.9999
Shallow (15) vs. Marina (15)	11.30	No	ns	>0.9999
Shallow (15) vs. Industrial/Port (15)	-14.13	No	ns	0.6098
FW-Influenced (15) vs. Marina (15)	21.33	Yes	*	0.0468
FW-Influenced (15) vs. Industrial/Port (15)	-4.100	No	ns	>0.9999
Marina (15) vs. Industrial/Port (15)	-25.43	Yes	**	0.0075

Sediment Mean ER-M Quotient (untransformed) – Welch's ANOVA with Dunnett's T3 Multiple Comparisons Test

Welch's ANOVA test

W (DFn, DFd)	10.20 (4.000, 32.71)
P value	<0.0001
P value summary	****
Significant diff. among means (P < 0.05)?	Yes
W (DFn, DFd)	10.20 (4.000, 32.71)
P value	<0.0001

Data summary

Number of treatments (columns)	5
Number of values (total)	75

Dunnett's T3 multiple comparisons test	Mean Diff.	95.00% CI of diff.	Below threshold?	Summary	Adjusted P Value
Deep (15) vs. Shallow (15)	-0.03241	-0.08110 to 0.01628	No	ns	0.3929
Deep (15) vs. FW-Influenced (15)	-0.2070	-0.4506 to 0.03671	No	ns	0.1259
Deep (15) vs. Marina (15)	-0.1742	-0.2950 to -0.05347	Yes	**	0.0024
Deep (15) vs. Industrial/Port (15)	-0.1385	-0.2292 to -0.04790	Yes	**	0.0012
Shallow (15) vs. FW-Influenced (15)	-0.1746	-0.4191 to 0.07000	No	ns	0.2638
Shallow (15) vs. Marina (15)	-0.1418	-0.2612 to -0.02243	Yes	*	0.0147
Shallow (15) vs. Industrial/Port (15)	-0.1061	-0.1937 to -0.01856	Yes	*	0.0119
FW-Influenced (15) vs. Marina (15)	0.03274	-0.2247 to 0.2902	No	ns	>0.9999
FW-Influenced (15) vs. Industrial/Port (15)	0.06843	-0.1818 to 0.3186	No	ns	0.9877
Marina (15) vs. Industrial/Port (15)	0.03568	-0.09962 to 0.1710	No	ns	0.9941

Sediment Σ SEM:AVS (untransformed) – Kruskal-Wallis

Kruskal-Wallis test

P value	0.1547
Exact or approximate P value?	Approximate
P value summary	ns
Do the medians vary signif. (P < 0.05)?	No
Number of groups	5
Kruskal-Wallis statistic	6.664

Data summary

Number of treatments (columns)	5
Number of values (total)	75

Chemical Score Index (CSI) Values (untransformed) – Welch's ANOVA with Dunnett's T3 Multiple Comparisons Test

Welch's ANOVA test

W (DFn, DFd)	9.853 (4.000, 34.36)
P value	<0.0001
P value summary	****
Significant diff. among means (P < 0.05)?	Yes
W (DFn, DFd)	9.853 (4.000, 34.36)
P value	<0.0001

Data summary

Number of treatments (columns)	5
Number of values (total)	75

Dunnett's T3 multiple comparisons test	Mean Diff.	95.00% CI of diff.	Below threshold?	Summary	Adjusted P Value
Deep (15) vs. Shallow (15)	-0.1193	-0.4131 to 0.1744	No	ns	0.9053
Deep (15) vs. FW-Influenced (15)	-0.4680	-1.050 to 0.1142	No	ns	0.1713
Deep (15) vs. Marina (15)	-0.5507	-0.9278 to -0.1736	Yes	**	0.0016
Deep (15) vs. Industrial/Port (15)	-0.6380	-1.012 to -0.2642	Yes	***	0.0002
Shallow (15) vs. FW-Influenced (15)	-0.3487	-0.9297 to 0.2324	No	ns	0.4950
Shallow (15) vs. Marina (15)	-0.4313	-0.8108 to -0.05189	Yes	*	0.0185
Shallow (15) vs. Industrial/Port (15)	-0.5187	-0.8948 to -0.1425	Yes	**	0.0029
FW-Influenced (15) vs. Marina (15)	-0.08267	-0.6981 to 0.5328	No	ns	>0.9999
FW-Influenced (15) vs. Industrial/Port (15)	-0.1700	-0.7834 to 0.4434	No	ns	0.9904
Marina (15) vs. Industrial/Port (15)	-0.08733	-0.5247 to 0.3500	No	ns	0.9994

Amphipod % Survival (untransformed) – Kruskal-Wallis with Dunn's Multiple Comparisons Test

Kruskal-Wallis test

P value	0.0001
Exact or approximate P value?	Approximate
P value summary	***
Do the medians vary signif. (P < 0.05)?	Yes
Number of groups	5
Kruskal-Wallis statistic	22.84

Data summary

Number of treatments (columns)	5
Number of values (total)	75

Dunn's multiple comparisons test	Mean rank diff.	Significant?	Summary	Adjusted P Value
Deep (15) vs. Shallow (15)	13.07	No	ns	>0.9999
Deep (15) vs. FW-Influenced (15)	20.87	No	ns	0.0870
Deep (15) vs. Marina (15)	11.80	No	ns	>0.9999
Deep (15) vs. Industrial/Port (15)	36.43	Yes	****	<0.0001
Shallow (15) vs. FW-Influenced (15)	7.800	No	ns	>0.9999
Shallow (15) vs. Marina (15)	-1.267	No	ns	>0.9999
Shallow (15) vs. Industrial/Port (15)	23.37	Yes	*	0.0330
FW-Influenced (15) vs. Marina (15)	-9.067	No	ns	>0.9999
FW-Influenced (15) vs. Industrial/Port (15)	15.57	No	ns	0.5033
Marina (15) vs. Industrial/Port (15)	24.63	Yes	*	0.0195

Bivalve % Normal Development (untransformed) – Kruskal-Wallis

Kruskal-Wallis test

P value	0.1714
Exact or approximate P value?	Approximate
P value summary	ns
Do the medians vary signif. ($P < 0.05$)?	No
Number of groups	5
Kruskal-Wallis statistic	6.397

Data summary

Number of treatments (columns)	5
Number of values (total)	75

Benthic Infauna Shannon-Wiener Diversity Index (untransformed) – Kruskal-Wallis

Kruskal-Wallis test

P value	0.0592
Exact or approximate P value?	Approximate
P value summary	ns
Do the medians vary signif. ($P < 0.05$)?	No
Number of groups	5
Kruskal-Wallis statistic	9.075

Data summary

Number of treatments (columns)	5
Number of values (total)	75

Benthic Infauna Taxa Richness (log transformed) – One-way ANOVA

ANOVA summary

F	1.125
P value	0.3517
P value summary	ns
Significant diff. among means ($P < 0.05$)?	No
R squared	0.06042

Data summary

Number of treatments (columns)	5
Number of values (total)	75

Benthic Response Index (BRI) (untransformed) – Kruskal-Wallis with Dunn's Multiple Comparisons Test

Kruskal-Wallis test

P value	0.0001
Exact or approximate P value?	Approximate
P value summary	***
Do the medians vary signif. (P < 0.05)?	Yes
Number of groups	5
Kruskal-Wallis statistic	23.23

Data summary

Number of treatments (columns)	5
Number of values (total)	75

Dunn's multiple comparisons test	Mean rank diff.	Significant?	Summary	Adjusted P Value
Deep (15) vs. Shallow (15)	-26.53	Yes	**	0.0086
Deep (15) vs. FW-Influenced (15)	-30.40	Yes	**	0.0013
Deep (15) vs. Marina (15)	-32.73	Yes	***	0.0004
Deep (15) vs. Industrial/Port (15)	-30.00	Yes	**	0.0016
Shallow (15) vs. FW-Influenced (15)	-3.867	No	ns	>0.9999
Shallow (15) vs. Marina (15)	-6.200	No	ns	>0.9999
Shallow (15) vs. Industrial/Port (15)	-3.467	No	ns	>0.9999
FW-Influenced (15) vs. Marina (15)	-2.333	No	ns	>0.9999
FW-Influenced (15) vs. Industrial/Port (15)	0.4000	No	ns	>0.9999
Marina (15) vs. Industrial/Port (15)	2.733	No	ns	>0.9999

Index of Biotic Integrity (IBI) (untransformed) – Kruskal-Wallis with Dunn's Multiple Comparisons Test

Kruskal-Wallis test

P value	0.2600
Exact or approximate P value?	Approximate
P value summary	ns
Do the medians vary signif. (P < 0.05)?	No
Number of groups	5
Kruskal-Wallis statistic	5.278

Data summary

Number of treatments (columns)	5
Number of values (total)	75

Relative Benthic Index (RBI) (untransformed) – Kruskal-Wallis with Dunn's Multiple Comparisons Test

Kruskal-Wallis test

P value	0.1080
Exact or approximate P value?	Approximate
P value summary	ns
Do the medians vary signif. (P < 0.05)?	No
Number of groups	5
Kruskal-Wallis statistic	7.586

Data summary

Number of treatments (columns)	5
Number of values (total)	75

River Invertebrate Prediction and Classification System (RIVPACS) (untransformed) – Kruskal-Wallis with Dunn's Multiple Comparisons Test

Kruskal-Wallis test

P value	0.6242
Exact or approximate P value?	Approximate
P value summary	ns
Do the medians vary signif. ($P < 0.05$)?	No
Number of groups	5
Kruskal-Wallis statistic	2.615

Data summary

Number of treatments (columns)	5
Number of values (total)	75

Statistical Comparisons for Chemistry and Indices by Strata Over Time (2008–2023)

t-test Results Comparing Water Chemistry Metrics between 2008 and 2023

Assessment Metric	Statistical Test	Transformation Prior to Analysis	P-value	Significantly Different?	Significant Increase or Decrease since 2008?
Dissolved Copper	Mann-Whitney	NA	0.0024	Yes	Decrease
Total PAHs	Mann-Whitney	NA	<0.0001	Yes	Decrease

Notes:

NA = not applicable

Water Column Dissolved Copper (log transformed) – Two-way ANOVA (Year and Stratum)Two-way ANOVA
AlphaOrdinary
0.05

Source of Variation	% of total variation	P value	P value summary	Significant?
Interaction	3.011	0.3754	ns	No
Row Factor (Year)	2.666	0.0103	*	Yes
Column Factor (Stratum)	29.28	<0.0001	****	Yes

Tukey's multiple comparisons test	Predicted (LS) mean diff.	95.00% CI of diff.	Below threshold?	Summary	Adjusted P Value
<u>Deep</u>					
2008 vs. 2013	-0.05054	-0.2857 to 0.1846	No	ns	0.9450
2008 vs. 2018	0.2366	-0.002338 to 0.4755	No	ns	0.0534
2008 vs. 2023	0.1317	-0.1073 to 0.3706	No	ns	0.4853
2013 vs. 2018	0.2871	0.05196 to 0.5223	Yes	**	0.0096
2013 vs. 2023	0.1822	-0.05297 to 0.4173	No	ns	0.1896
2018 vs. 2023	-0.1049	-0.3439 to 0.1340	No	ns	0.6681
<u>Shallow</u>					
2008 vs. 2013	0.09926	-0.1439 to 0.3424	No	ns	0.7171
2008 vs. 2018	0.09105	-0.1484 to 0.3305	No	ns	0.7594
2008 vs. 2023	0.1667	-0.07646 to 0.4098	No	ns	0.2891
2013 vs. 2018	-0.008205	-0.2434 to 0.2270	No	ns	0.9997
2013 vs. 2023	0.06744	-0.1715 to 0.3064	No	ns	0.8852
2018 vs. 2023	0.07564	-0.1595 to 0.3108	No	ns	0.8395
<u>FW-Influenced</u>					
2008 vs. 2013	0.1433	-0.09561 to 0.3822	No	ns	0.4090
2008 vs. 2018	0.03826	-0.2049 to 0.2814	No	ns	0.9772
2008 vs. 2023	0.2119	-0.02700 to 0.4509	No	ns	0.1022
2013 vs. 2018	-0.1050	-0.3482 to 0.1381	No	ns	0.6796
2013 vs. 2023	0.06862	-0.1703 to 0.3075	No	ns	0.8799
2018 vs. 2023	0.1737	-0.06949 to 0.4168	No	ns	0.2541
<u>Marina</u>					
2008 vs. 2013	0.02319	-0.2120 to 0.2584	No	ns	0.9942
2008 vs. 2018	0.1210	-0.1142 to 0.3561	No	ns	0.5449
2008 vs. 2023	0.08298	-0.1522 to 0.3181	No	ns	0.7985
2013 vs. 2018	0.09778	-0.1411 to 0.3367	No	ns	0.7155
2013 vs. 2023	0.05979	-0.1791 to 0.2987	No	ns	0.9166
2018 vs. 2023	-0.03798	-0.2769 to 0.2009	No	ns	0.9766
<u>Industrial/Port</u>					
2008 vs. 2013	-0.03375	-0.2769 to 0.2094	No	ns	0.9842
2008 vs. 2018	0.001749	-0.2372 to 0.2407	No	ns	>0.9999
2008 vs. 2023	0.03633	-0.2026 to 0.2753	No	ns	0.9794
2013 vs. 2018	0.03550	-0.2077 to 0.2787	No	ns	0.9817
2013 vs. 2023	0.07008	-0.1731 to 0.3132	No	ns	0.8788

Water Column Total PAHs (log transformed) – Two-way ANOVA (Year and Stratum)

Two-way ANOVA
AlphaOrdinary
0.05

Source of Variation	% of total variation	P value	P value summary	Significant?
Interaction	4.572	0.2204	ns	No
Row Factor (Year)	15.82	<0.0001	****	Yes
Column Factor (Stratum)	7.237	<0.0001	****	Yes

Tukey's multiple comparisons test	Predicted (LS) mean diff.	95.00% CI of diff.	Below threshold?	Summary	Adjusted P Value
<u>Deep</u>					
2008 vs. 2013	0.1212	-0.2545 to 0.4969	No	ns	0.8381
2008 vs. 2018	0.4029	0.02101 to 0.7848	Yes	*	0.0342
2008 vs. 2023	0.3990	0.01012 to 0.7879	Yes	*	0.0419
2013 vs. 2018	0.2817	-0.08674 to 0.6502	No	ns	0.1992
2013 vs. 2023	0.2778	-0.09788 to 0.6535	No	ns	0.2253
2018 vs. 2023	-0.003887	-0.3858 to 0.3780	No	ns	>0.9999
<u>Shallow</u>					
2008 vs. 2013	0.1978	-0.1862 to 0.5819	No	ns	0.5430
2008 vs. 2018	0.4255	0.02075 to 0.8303	Yes	*	0.0351
2008 vs. 2023	0.4614	0.04749 to 0.8753	Yes	*	0.0221
2013 vs. 2018	0.2277	-0.1563 to 0.6117	No	ns	0.4189
2013 vs. 2023	0.2635	-0.1301 to 0.6571	No	ns	0.3093
2018 vs. 2023	0.03584	-0.3780 to 0.4497	No	ns	0.9960
<u>FW-Influenced</u>					
2008 vs. 2013	0.2839	-0.07817 to 0.6459	No	ns	0.1804
2008 vs. 2018	0.5880	0.1944 to 0.9816	Yes	***	0.0008
2008 vs. 2023	0.6974	0.3217 to 1.073	Yes	****	<0.0001
2013 vs. 2018	0.3041	-0.08945 to 0.6977	No	ns	0.1912
2013 vs. 2023	0.4135	0.03780 to 0.7892	Yes	*	0.0246
2018 vs. 2023	0.1094	-0.2968 to 0.5156	No	ns	0.8983
<u>Marina</u>					
2008 vs. 2013	-0.1632	-0.5317 to 0.2052	No	ns	0.6613
2008 vs. 2018	0.06345	-0.3471 to 0.4740	No	ns	0.9783
2008 vs. 2023	-0.01998	-0.4305 to 0.3905	No	ns	0.9993
2013 vs. 2018	0.2267	-0.1781 to 0.6315	No	ns	0.4703
2013 vs. 2023	0.1433	-0.2615 to 0.5481	No	ns	0.7965
2018 vs. 2023	-0.08343	-0.5268 to 0.3600	No	ns	0.9620
<u>Industrial/Port</u>					
2008 vs. 2013	0.01851	-0.3499 to 0.3870	No	ns	0.9992
2008 vs. 2018	0.3183	-0.04371 to 0.6804	No	ns	0.1069
2008 vs. 2023	0.5592	0.1656 to 0.9528	Yes	**	0.0017
2013 vs. 2018	0.2998	-0.06863 to 0.6683	No	ns	0.1544
2013 vs. 2023	0.5407	0.1412 to 0.9402	Yes	**	0.0031

t-test Results Comparing Select Sediment Chemistry Metrics between 2008 and 2023

Assessment Metric	Statistical Test	Transformation Prior to Analysis	P-value	Significantly Different?	Significant Increase or Decrease since 2008?
Copper	Mann-Whitney	NA	0.1318	No	NA
Mercury	Unpaired t-test	log(Y+1)	0.2082	No	NA
Zinc	Unpaired t-test	NA	0.4340	No	NA
Total HPAHs	Unpaired t-test	log(Y+1)	0.0250	Yes	Decrease
Total LPAHs	Mann-Whitney	NA	0.0057	Yes	Decrease
Total PCBs (SQO Congeners only)	Mann-Whitney	NA	0.1970	No	NA
Total Pyrethroids	Mann-Whitney	NA	<0.0001	Yes	Increase
Total PBDEs	Mann-Whitney	NA	0.1247	No	NA
Mean ER-M Quotient	Mann-Whitney	NA	0.1774	No	NA
Chemical Score Index (CSI)	Unpaired t-test	NA	0.0079	Yes	Decrease

Notes:

NA = not applicable

For totals in which all individual components were non-detect, the total was included as ½ MDL for statistical comparisons.

Sediment Total HPAHs (log transformed) – Two-way ANOVA (Year and Stratum)Two-way ANOVA
AlphaOrdinary
0.05

Source of Variation	% of total variation	P value	P value summary	Significant?
Interaction	1.593	0.9004	ns	No
Row Factor (Year)	7.362	<0.0001	****	Yes
Column Factor (Stratum)	19.39	<0.0001	****	Yes

Tukey's multiple comparisons test	Predicted (LS) mean diff.	95.00% CI of diff.	Below threshold?	Summary	Adjusted P Value
<u>Deep</u>					
2008 vs. 2013	0.4856	0.01441 to 0.9569	Yes	*	0.0406
2008 vs. 2018	0.4630	-0.01576 to 0.9418	No	ns	0.0622
2008 vs. 2023	0.2723	-0.2064 to 0.7511	No	ns	0.4570
2013 vs. 2018	-0.02264	-0.4939 to 0.4486	No	ns	0.9993
2013 vs. 2023	-0.2133	-0.6845 to 0.2579	No	ns	0.6463
2018 vs. 2023	-0.1907	-0.6694 to 0.2881	No	ns	0.7324
<u>Freshwater-Influenced</u>					
2008 vs. 2013	0.6205	0.1418 to 1.099	Yes	**	0.0051
2008 vs. 2018	0.3717	-0.1155 to 0.8590	No	ns	0.2012
2008 vs. 2023	0.3195	-0.1593 to 0.7983	No	ns	0.3127
2013 vs. 2018	-0.2488	-0.7361 to 0.2384	No	ns	0.5510
2013 vs. 2023	-0.3010	-0.7798 to 0.1777	No	ns	0.3662
2018 vs. 2023	-0.05222	-0.5395 to 0.4350	No	ns	0.9926
<u>Marina</u>					
2008 vs. 2013	0.2829	-0.1883 to 0.7541	No	ns	0.4081
2008 vs. 2018	0.1364	-0.3348 to 0.6076	No	ns	0.8774
2008 vs. 2023	0.008608	-0.4626 to 0.4798	No	ns	>0.9999
2013 vs. 2018	-0.1465	-0.6253 to 0.3323	No	ns	0.8586
2013 vs. 2023	-0.2743	-0.7531 to 0.2045	No	ns	0.4505
2018 vs. 2023	-0.1278	-0.6066 to 0.3510	No	ns	0.9009
<u>Industrial/Port</u>					
2008 vs. 2013	0.5698	0.08253 to 1.057	Yes	*	0.0145
2008 vs. 2018	0.2001	-0.2787 to 0.6789	No	ns	0.7019
2008 vs. 2023	0.3213	-0.1575 to 0.8000	No	ns	0.3079
2013 vs. 2018	-0.3697	-0.8569 to 0.1176	No	ns	0.2054
2013 vs. 2023	-0.2485	-0.7357 to 0.2387	No	ns	0.5521
2018 vs. 2023	0.1212	-0.3576 to 0.5999	No	ns	0.9141
<u>Shallow</u>					
2008 vs. 2013	0.2502	-0.2371 to 0.7374	No	ns	0.5465
2008 vs. 2018	0.1034	-0.3765 to 0.5832	No	ns	0.9446
2008 vs. 2023	0.05275	-0.4345 to 0.5400	No	ns	0.9923
2013 vs. 2018	-0.1468	-0.6180 to 0.3244	No	ns	0.8520
2013 vs. 2023	-0.1974	-0.6762 to 0.2813	No	ns	0.7107
2018 vs. 2023	-0.05062	-0.5218 to 0.4206	No	ns	0.9925

Sediment Total LPAHs (log transformed) – Two-way ANOVA (Year and Stratum)Two-way ANOVA
AlphaOrdinary
0.05

Source of Variation	% of total variation	P value	P value summary	Significant?
Interaction	1.627	0.9349	ns	No
Row Factor (Year)	3.930	0.0044	**	Yes
Column Factor (Stratum)	12.38	<0.0001	****	Yes

Tukey's multiple comparisons test	Predicted (LS) mean diff.	95.00% CI of diff.	Below threshold?	Summary	Adjusted P Value
<u>Deep</u>					
2008 vs. 2013	0.3481	-0.08809 to 0.7842	No	ns	0.1681
2008 vs. 2018	0.2721	-0.1710 to 0.7152	No	ns	0.3877
2008 vs. 2023	0.4343	-0.008838 to 0.8774	No	ns	0.0571
2013 vs. 2018	-0.07595	-0.5121 to 0.3602	No	ns	0.9696
2013 vs. 2023	0.08623	-0.3499 to 0.5224	No	ns	0.9564
2018 vs. 2023	0.1622	-0.2810 to 0.6053	No	ns	0.7801
<u>Freshwater-Influenced</u>					
2008 vs. 2013	0.3360	-0.1071 to 0.7791	No	ns	0.2059
2008 vs. 2018	0.1535	-0.2975 to 0.6045	No	ns	0.8153
2008 vs. 2023	0.2485	-0.1946 to 0.6916	No	ns	0.4697
2013 vs. 2018	-0.1825	-0.6335 to 0.2685	No	ns	0.7227
2013 vs. 2023	-0.08750	-0.5306 to 0.3556	No	ns	0.9566
2018 vs. 2023	0.09498	-0.3560 to 0.5460	No	ns	0.9480
<u>Marina</u>					
2008 vs. 2013	0.1498	-0.2863 to 0.5860	No	ns	0.8112
2008 vs. 2018	0.1248	-0.3114 to 0.5609	No	ns	0.8811
2008 vs. 2023	0.2492	-0.1870 to 0.6853	No	ns	0.4531
2013 vs. 2018	-0.02506	-0.4682 to 0.4181	No	ns	0.9989
2013 vs. 2023	0.09934	-0.3438 to 0.5425	No	ns	0.9382
2018 vs. 2023	0.1244	-0.3187 to 0.5675	No	ns	0.8868
<u>Industrial/Port</u>					
2008 vs. 2013	0.3218	-0.1291 to 0.7728	No	ns	0.2548
2008 vs. 2018	0.2619	-0.1812 to 0.7051	No	ns	0.4223
2008 vs. 2023	0.2705	-0.1727 to 0.7136	No	ns	0.3932
2013 vs. 2018	-0.05992	-0.5109 to 0.3911	No	ns	0.9860
2013 vs. 2023	-0.05138	-0.5024 to 0.3996	No	ns	0.9911
2018 vs. 2023	0.008541	-0.4346 to 0.4517	No	ns	>0.9999
<u>Shallow</u>					
2008 vs. 2013	-0.02777	-0.4787 to 0.4232	No	ns	0.9986
2008 vs. 2018	-0.1110	-0.5551 to 0.3331	No	ns	0.9169
2008 vs. 2023	0.07976	-0.3712 to 0.5307	No	ns	0.9682
2013 vs. 2018	-0.08325	-0.5194 to 0.3529	No	ns	0.9605
2013 vs. 2023	0.1075	-0.3356 to 0.5507	No	ns	0.9233

Sediment Total Pyrethroids (log transformed) – Two-way ANOVA (Year and Stratum)Two-way ANOVA
AlphaOrdinary
0.05

Source of Variation	% of total variation	P value	P value summary	Significant?
Interaction	8.644	<0.0001	****	Yes
Row Factor (Year)	18.66	<0.0001	****	Yes
Column Factor (Stratum)	22.78	<0.0001	****	Yes

Tukey's multiple comparisons test	Predicted (LS) mean diff.	95.00% CI of diff.	Below threshold?	Summary	Adjusted P Value
<u>Deep</u>					
2008 vs. 2013	0.03644	-0.2976 to 0.3704	No	ns	0.9922
2008 vs. 2018	-0.1042	-0.4435 to 0.2351	No	ns	0.8573
2008 vs. 2023	-0.1055	-0.4448 to 0.2339	No	ns	0.8528
2013 vs. 2018	-0.1406	-0.4746 to 0.1934	No	ns	0.6970
2013 vs. 2023	-0.1419	-0.4759 to 0.1921	No	ns	0.6909
2018 vs. 2023	-0.001285	-0.3406 to 0.3380	No	ns	>0.9999
<u>Shallow</u>					
2008 vs. 2013	0.09197	-0.2534 to 0.4373	No	ns	0.9015
2008 vs. 2018	-0.002851	-0.3429 to 0.3372	No	ns	>0.9999
2008 vs. 2023	-0.2190	-0.5643 to 0.1264	No	ns	0.3585
2013 vs. 2018	-0.09482	-0.4288 to 0.2392	No	ns	0.8835
2013 vs. 2023	-0.3109	-0.6503 to 0.02839	No	ns	0.0857
2018 vs. 2023	-0.2161	-0.5501 to 0.1179	No	ns	0.3402
<u>FW-Influenced</u>					
2008 vs. 2013	0.3273	-0.01200 to 0.6667	No	ns	0.0632
2008 vs. 2018	-0.5074	-0.8527 to -0.1620	Yes	**	0.0010
2008 vs. 2023	-0.8163	-1.156 to -0.4770	Yes	****	<0.0001
2013 vs. 2018	-0.8347	-1.180 to -0.4893	Yes	****	<0.0001
2013 vs. 2023	-1.144	-1.483 to -0.8043	Yes	****	<0.0001
2018 vs. 2023	-0.3090	-0.6543 to 0.03638	No	ns	0.0977
<u>Marina</u>					
2008 vs. 2013	0.02386	-0.3101 to 0.3579	No	ns	0.9978
2008 vs. 2018	-0.07531	-0.4093 to 0.2587	No	ns	0.9372
2008 vs. 2023	-0.4995	-0.8335 to -0.1655	Yes	***	0.0008
2013 vs. 2018	-0.09918	-0.4385 to 0.2402	No	ns	0.8743
2013 vs. 2023	-0.5234	-0.8627 to -0.1840	Yes	***	0.0005
2018 vs. 2023	-0.4242	-0.7635 to -0.08486	Yes	**	0.0075
<u>Industrial/Port</u>					
2008 vs. 2013	0.01157	-0.3338 to 0.3569	No	ns	0.9998
2008 vs. 2018	-0.3099	-0.6492 to 0.02944	No	ns	0.0873
2008 vs. 2023	-0.6352	-0.9745 to -0.2959	Yes	****	<0.0001
2013 vs. 2018	-0.3215	-0.6668 to 0.02387	No	ns	0.0783
2013 vs. 2023	-0.6468	-0.9921 to -0.3014	Yes	****	<0.0001

Chemical Score Index (CSI) Values (untransformed) – Two-way ANOVA (Year and Stratum)**Two-way ANOVA**

Alpha

Ordinary

0.05

Source of Variation	% of total variation	P value	P value summary	Significant?
Interaction	0.7038	0.9962	ns	No
Row Factor (Year)	2.925	0.0086	**	Yes
Column Factor (Stratum)	27.13	<0.0001	****	Yes

Tukey's multiple comparisons test	Predicted (LS) mean diff.	95.00% CI of diff.	Below threshold?	Summary	Adjusted P Value
<u>Deep</u>					
2008 vs. 2013	0.1629	-0.2277 to 0.5534	No	ns	0.7033
2008 vs. 2018	0.2640	-0.1328 to 0.6608	No	ns	0.3154
2008 vs. 2023	0.2420	-0.1548 to 0.6388	No	ns	0.3939
2013 vs. 2018	0.1011	-0.2894 to 0.4917	No	ns	0.9086
2013 vs. 2023	0.07912	-0.3114 to 0.4697	No	ns	0.9533
2018 vs. 2023	-0.02200	-0.4188 to 0.3748	No	ns	0.9989
<u>Freshwater-Influenced</u>					
2008 vs. 2013	0.1253	-0.2715 to 0.5221	No	ns	0.8467
2008 vs. 2018	0.1360	-0.2679 to 0.5398	No	ns	0.8203
2008 vs. 2023	0.1947	-0.2021 to 0.5915	No	ns	0.5841
2013 vs. 2018	0.01062	-0.3932 to 0.4144	No	ns	0.9999
2013 vs. 2023	0.06933	-0.3275 to 0.4661	No	ns	0.9693
2018 vs. 2023	0.05871	-0.3451 to 0.4625	No	ns	0.9819
<u>Marina</u>					
2008 vs. 2013	0.1951	-0.1955 to 0.5856	No	ns	0.5694
2008 vs. 2018	0.2171	-0.1735 to 0.6076	No	ns	0.4776
2008 vs. 2023	0.2191	-0.1715 to 0.6096	No	ns	0.4694
2013 vs. 2018	0.02200	-0.3748 to 0.4188	No	ns	0.9989
2013 vs. 2023	0.02400	-0.3728 to 0.4208	No	ns	0.9986
2018 vs. 2023	0.002000	-0.3948 to 0.3988	No	ns	>0.9999
<u>Industrial/Port</u>					
2008 vs. 2013	0.2329	-0.1709 to 0.6367	No	ns	0.4445
2008 vs. 2018	0.04400	-0.3528 to 0.4408	No	ns	0.9918
2008 vs. 2023	0.1573	-0.2395 to 0.5541	No	ns	0.7351
2013 vs. 2018	-0.1889	-0.5927 to 0.2149	No	ns	0.6216
2013 vs. 2023	-0.07557	-0.4794 to 0.3282	No	ns	0.9627
2018 vs. 2023	0.1133	-0.2835 to 0.5101	No	ns	0.8816
<u>Shallow</u>					
2008 vs. 2013	0.2670	-0.1369 to 0.6708	No	ns	0.3211
2008 vs. 2018	0.2424	-0.1553 to 0.6401	No	ns	0.3943
2008 vs. 2023	0.1910	-0.2129 to 0.5948	No	ns	0.6133
2013 vs. 2018	-0.02454	-0.4151 to 0.3660	No	ns	0.9985
2013 vs. 2023	-0.07600	-0.4728 to 0.3208	No	ns	0.9601