

NELHA Water Quality Laboratory

Seawater Return Trench 4

1/28/1992 - 6/30/2025

Site ID	Date (M/D/Y)	Time (2400)	Tide (ft) (cycle)	PO ₄ ³⁻ (μM) (μg P/L)	NO ₃ ⁻ & NO ₂ ⁻ (μM) (μg N/L)	NH ₄ ⁺ & NH ₃ (μM) (μg N/L)	Si (μM) (μg Si/L)	TDP (μM) (μg P/L)	TDN (μM) (μg N/L)	Turbidity (NTU)	Salinity (PSU)	Chloride (mg/L)	Temp. (°C)	pH (unit)	DO (ppm)	Chl a (μg/L)	ORP (mV)
SRT 4s	1/28/92	705	0.6 Low	1.8 54	60.2 843	0.1 0.7	478 13425	1.9 59	63 880								
SRT 4s	4/20/92	1146	-0.1 Low	2.6 82	56.3 789	0.1 0.7	508 14267	2.9 91	61 853	TSS 1.36 mg/L	15.51	8584	19.8	8.21		6.57	
SRT 4s	5/20/92	1059	0.1 Low	0.6 20	31.6 443	0.3 4.6	601 16879	1.0 30	39 550	TSS 5.31 mg/L	14.86	8225	24.1	8.03		2.39	
SRT 4s	6/24/92	1053	1.3 Flood	2.1 64	50.3 705	0.5 7.3	586 16458	2.3 72	59 831	TSS 0.57 mg/L	15.67	8672	25.5	8.50		30.0	
SRT 4s	7/30/92	1000	-0.1 Low	2.0 62	50.4 706	1.3 18.8	525 14731	2.2 68	55 767	0.38*	16.31	9027	24.5	8.02	7.70	6.55	
SRT 4s	8/31/92	1005	1.2 Ebb	2.0 62	44.0 616	1.1 14.9	570 16009	2.2 67	48 674	0.55	16.58		24.6	8.06	8.48	5.27	
SRT 4s	9/23/92	1041	1.0 Flood	2.0 61	303 4243	46.5 651.3	585 16430	2.0 62	403 5639	1.64	15.57	8616	24.9	7.59	ND	1.13	
SRT 4s	10/28/92	1059	0.8 Ebb							0.94	15.95	8829	24.1	8.10	8.19	3.84	
SRT 4s	11/18/92	1121	1.6 High	2.0 63	61.0 855	0.2 2.2	577 16205	2.5 76	137 1919	0.75	15.23	8431	23.9	8.15	9.11	13.1	
SRT 4s	12/28/92	811	1.7 High	2.9 90	60.6 849	0.3 4.6	654 18368	3.5 107	75 1056	0.84	13.78	7627	20.5	8.02	7.71	0.21	
SRT 4s	1/27/93	1013	0.7 Ebb	2.5 78	69.6 975	0.4 5.7	637 17901	2.7 83	78 1093	1.08	11.46	6345	20.8	7.87	5.95	0.26	
SRT 4s	2/24/93	945	0.4 Ebb	2.7 83	66.8 936	0.2 3.4	615 17284	2.8 85	69 968	0.37	13.53	7487	19.1	7.98	7.29	0.40	
SRT 4s	3/17/93	1010	0.4 Flood	2.5 77	67.6 946	0.3 4.8	642 18028	2.5 79	72 1002	4.0	11.56	6399	21.9	8.06	7.78	1.68	
SRT 4s	4/28/93	938	0.5 High	2.6 82	70.7 990	1.5 20.7	638 17919	2.8 87	77 1080	0.54	11.55	6391	22.3	8.05	7.74	0.28	
SRT 4s	5/26/93	947	0.6 High	1.5 46	20.9 292	0.5 6.4	725 20362	1.7 51	26 365	0.14	34.43	19060	16.0	7.96	6.83	0.24	
SRT 4s	6/29/93	949	0.8 Flood	2.7 84	71.3 998	1.5 21.3	655 18396	2.9 90	78 1095	0.77	11.58	6411	22.9	8.08	7.79	0.36	
SRT 4s	9/1/93	952	0.3 Low	2.8 86	68.1 954	0.1 1.5	660 18536	2.9 90	90 1256	0.29	11.61	6425	23.9	8.08	7.31	0.10	
SRT 4s	10/27/93	941	0.6 Low	2.8 88	73.2 1025	0.8 10.6	610 17132	2.9 90	76 1071	0.98	10.59	5860	22.5	8.00	6.73	0.08	
SRT 4s	2/8/94	945	0.2 Low	3.0 93	68.9 965	0.5 7.3	580 16290	3.0 94	80 1116	0.15	12.70	7028	21.7	8.00	7.55	0.09	
SRT 4s	6/22/94	939	-0.2 Low	2.4 75	63.8 894	0.8 10.8	568 15939	2.5 77	69 963	0.88	12.84	7105	23.5	8.09	8.21	7.72	
SRT 4s	7/26/94	1043	0.7 Ebb	1.3 42	19.2 269	0.3 3.9	43 1202	1.6 49	25 347	0.07	34.48	19084	17.4	7.98	1.60	0.00	
SRT 4s	10/26/94	857	1.8 High	2.9 91	75.4 1056	1.0 13.6	589 16537	3.1 96	80 1114	0.25	11.50	6366	22.7	8.05	7.30	1.26	
SRT 4s	1/25/95	1048	0.8 High	3.4 105	76.8 1076	0.0 0.0	535 15017	3.4 105	56 786	0.06	13.65	7557	20.7	8.08	7.74	0.00	
SRT 4s	5/10/95	630	-0.1 Low	3.3 102	99.0 1387	0.2 3.1	543 15259	3.3 102	88 1233	0.16	12.70	7027	19.6	8.07	7.08	0.14	
SRT 4s	9/13/95	710	1.8 High	3.3 103	74.6 1045	0.4 5.7	539 15124	3.4 106	78 1093	0.19	13.90	7696	20.8	7.99	6.72	0.04	
SRT 4s	11/7/95	1131	0.5 Flood	1.2 36	16.5 231	0.6 8.0	48 1344	1.3 40	23 315	0.09	34.23	18948	19.3	8.09	2.56	0.03	
SRT 4s	1/31/96	956	0.4 Flood	3.1 95	94.0 1317	0.9 11.9	473 13276	3.1 97	98 1379	1.83	12.68	7018	23.4	8.06	6.77	0.36	
SRT 4s	6/18/96	1221	0.3 Flood	2.6 81	58.7 823	8.7 122.1	370 10386	2.8 85	65 911	0.16	31.38	17370	23.0	8.03	8.13	0.18	
SRT 4s	8/6/96	1226	1.6 Ebb	2.1 65	68.8 963	0.3 4.2	499 14019	2.5 77	72 1010	0.63	14.58	8073	29.3	8.32	9.89	2.63	
SRT 4s	10/7/96	903	1.1 Flood	2.9 91	88.5 1239	0.6 8.3	598 16809	3.1 95	93 1308	0.12	11.17	6181	23.5	7.96	6.97	0.00	
SRT 4s	1/15/97	1103	1.0 Ebb	3.8 116	179 2510	0.3 3.9	513 14411	3.8 116	182 2551	0.10	12.64	6996	22.4	7.99	7.05	0.13	
SRT 4s	4/30/97	912	0.5 Flood	1.5 46	17.7 248	0.4 5.9	42 1168	2.5 77	21 290	0.13	34.22	18943	17.8	8.05	3.39	0.08	
SRT 4s	7/14/97	1047	1.4 Flood	1.0 31	87.2 1221	0.1 0.7	574 16132	1.7 53	97 1354	0.77	11.16	6175	25.5	8.43	10.86	13.7	
SRT 4s	10/14/97	1112	0.8 Flood	3.0 93	111 1551	0.1 1.0	597 16761	3.3 102	112 1564	0.65	10.39	5751	26.2	8.42	9.12	7.49	
SRT 4s	3/11/98	1304	0.6 Flood	3.4 104	84.5 1184	0.1 2.0	576 16183	3.6 110	89 1243	0.25	12.25	6782	26.3	8.18	8.93	6.67	
SRT 4s	4/15/98	1152	0.0 Low	2.8 85	77.2 1081	0.2 2.2	563 15812	3.0 93	82 1154	0.42	12.95	7167	24.8	8.23	9.44	7.47	
SRT 4s	7/15/98	945	1.3 High	1.7 54	67.8 950	0.2 2.1	562 15781	2.0 61	71 1000	0.94	13.84	7658	24.5	8.40	10.25	11.2	
SRT 4s	10/14/98	954	1.6 Flood	3.1 97	92.5 1296	0.1 0.7	571 16037	3.3 103	94 1310	0.27	12.54	6943	24.9	8.39	9.76	8.34	
SRT 4s	3/3/99	954	0.3 Ebb	3.4 105	77.1 1080	0.6 8.1	533 14970	3.5 107	85 1191	0.15	14.46	8003	22.3	8.00	8.74	1.04	
SRT 4s	4/14/99	947	-0.2 Flood	3.1 97	65.1 912	0.6 7.7	423 11869	3.3 101	68 954	0.10	19.24	10650	19.7	7.94	6.55	0.09	

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1/28/1992 - 6/30/2025

Site ID	Date (M/D/Y)	Time (2400)	Tide (ft) (cycle)	PO ₄ ³⁻ (μM) (μg P/L)	NO ₃ ⁻ & NO ₂ ⁻ (μM) (μg N/L)	NH ₄ ⁺ & NH ₃ (μM) (μg N/L)	Si (μM) (μg Si/L)	TDP (μM) (μg P/L)	TDN (μM) (μg N/L)	Turbidity (NTU)	Salinity (PSU)	Chloride (mg/L)	Temp. (°C)	pH (unit)	DO (ppm)	Chl a (μg/L)	ORP (mV)
SRT 4s	8/24/99	950	0.7 Flood	2.6 81	68.9 965	0.2 2.4	645 18118	2.9 90	71 1001	0.45	12.93	7158	25.2	8.28	8.78	8.37	
SRT 4s	10/12/99	1011	0.9 Ebb	3.4 106	77.5 1085	0.6 8.7	549 15422	3.6 112	81 1136	0.15	12.79	7081	24.3	8.10	7.67	0.29	
SRT 4s	3/1/00	1015	0.4 Flood	3.6 113	81.5 1142	0.3 4.8	564 15837	3.6 112	85 1192	0.24	19.49	10787	23.1	8.22	7.78	0.46	
SRT 4s	4/24/00	1039	0.3 Ebb	3.0 94	78.1 1094	0.1 1.7	564 15835	3.1 96	79 1108	0.15	13.40	7419	24.0	8.15	8.14	3.39	
SRT 4s	8/1/00	1000	0.0 Low	2.9 90	76.3 1069	0.1 1.3	536 15043	3.1 96	80 1121	0.26	15.03	8321	26.1	8.16	8.21	4.41	
SRT 4s	12/20/00	935	0.9 Flood	3.8 116	104 1452	1.1 15.7	571 16048	4.0 122	111 1561	0.22	11.90	6584	22.7	8.11	7.17	0.38	
SRT 4s	2/27/01	958	0.6 Ebb	2.9 90	85.6 1199	0.1 1.7	542 15211	3.1 96	87 1215	0.24	13.19	7303	23.4	8.17	8.35	1.16	
SRT 4s	5/9/01	1006	-0.2 Low	2.9 90	82.7 1158	0.4 4.9	504 14152	3.2 99	85 1188	0.22	14.72	8146	24.3	8.12	8.12	4.81	
SRT 4s	9/11/01	1050	2.1 High	2.9 91	87.8 1230	0.3 3.8	544 15284	3.0 92	93 1300	0.22	12.77	7070	26.7	8.14	7.99	3.25	
SRT 4s	10/31/01	1009	0.4 Low	3.3 103	89.3 1250	1.0 13.7	577 16205	3.5 107	87 1218	0.12	12.52	6932	24.9	8.07	7.84	1.24	
SRT 4s	1/15/02	958	0.7 Ebb	3.6 113	105 1472	1.3 18.5	536 15054	3.7 113	107 1497	0.10	14.04	7773	21.9	8.06	7.39	0.99	
SRT 4s	5/28/02	1022	-0.2 Low	4.3 133	57.9 810	0.8 11.8	406 11391	4.6 143	64 889	0.79	17.70	9796	26.3	8.37	11.38	7.21	
SRT 4s	9/17/02	1025	1.2 Flood	4.5 138	108 1509	0.3 3.8	568 15961	4.8 147	98 1369	0.15	12.91	7148	25.5	8.08	7.68	1.72	
SRT 4s	12/16/02	1105	0.6 Flood	4.7 145	99.9 1399	0.3 4.1	548 15396	5.3 163	109 1525	0.21	12.47	6901	24.3	8.14	7.47	1.28	
SRT 4s	1/30/03	1040	0.1 Flood	4.8 148	122 1709	0.7 9.1	516 14498	5.0 155	152 2133	0.17	14.57	8065	24.2	8.08	7.17	3.85	
SRT 4s	5/28/03	948	0.3 Flood	5.4 168	114 1591	0.2 3.2	524 14720	5.6 174	126 1758	0.30	13.50	7471	25.4	8.25	8.25	2.83	
SRT 4s	9/18/03	1016	1.7 Flood	6.7 207	140 1965	0.7 9.9	522 14672	7.1 220	146 2041	0.10	12.41	6871	26.4	8.11	7.19	0.18	
SRT 4s	11/6/03	936	0.6 Flood	7.3 225	134 1878	1.2 16.4	549 15405	7.5 232	172 2412	0.11	12.63	6993	24.4	8.23		1.24	
SRT 4s	11/14/03	1007	1.7 Ebb										23.8		6.84		
SRT 4s	1/29/04	951	0.9 Ebb	12.5 387	465 6515	1.7 23.8	704 19758	12.2 378	477 6677	0.24	12.04	6664	22.4	8.40	6.87	0.47	
SRT 4s	6/1/04	822	-0.2 Flood	6.1 189	140 1965	0.1 0.8	534 15003	6.6 206	147 2065	0.51	11.42	6321	24.5	8.20	7.48	0.11	
SRT 4s	9/29/04	906	0.7 Ebb	9.2 285	129 1807	0.5 7.1	508 14276	9.8 302	142 1986	0.26	12.85	7113	24.4	8.10	7.04	2.23	
SRT 4s	12/2/04	929	1.9 Ebb	9.2 286	165 2308	0.4 5.9	534 15006	9.5 295	176 2465	0.58	11.82	6543	23.8	8.12	6.71	2.42	
SRT 4s	1/19/05	920	0.5 Flood	10.3 318	247 3462	0.2 2.1	497 13970	10.7 330	275 3846	0.17	11.82	6544	22.9	8.40	6.56	1.89	
SRT 4s	5/31/05	912	0.5 Flood	5.7 175	114 1594	0.2 3.2	507 14234	5.6 174	118 1646	0.25	12.45	6891	23.6	8.27	7.67	1.14	
SRT 4s	8/2/05	1013	0.6 Flood	11.4 353	159 2233	0.1 1.0	510 14324	11.8 366	163 2287	0.21	14.69	8129	24.9	8.27	7.29	1.49	
SRT 4s	11/1/05	845	0.7 Ebb	4.8 149	105 1467	1.6 22	474 13321	5.1 158	112 1567	0.46	11.36	6290	25.2	8.15	6.71	0.38	
SRT 4s	1/30/06	850	0.9 Ebb	2.4 73	36 502	19.8 277	175 4926	2.7 84	53 743	0.41	27.93	15458	23.1	7.77	5.72	0.34	
SRT 4s	5/25/06	1042	0.5 Flood	1.1 33	3 42	16.8 235	4 112	1.6 50	29 412	0.45	34.73	19224	26.8	7.95	7.22	0.96	
SRT 4s	7/27/06	1010	0.2 Low	0.9 28	3 41	13.5 189	17 486	2.0 61	34 480	1.29	34.47	19082	26.8	8.29	10.23	3.37	
SRT 4s	10/31/06	1041	1.8 Flood	2.0 62	9 124	36.5 511	3 88	2.9 89	63 879	0.47	34.86	19296	28.2	7.71	8.65	1.10	
SRT 4s	1/17/07	1017	0.2 Low	1.0 32	3 44	15.3 214	3 96	1.8 55	29 412	1.36	34.77	19247	25.7	8.04	7.73	4.90	
SRT 4s	6/26/07	942	0.8 Flood	1.3 40	7 99	15.1 212	6 158	2.3 72	32 453	0.33	34.65	19177	26.7	7.92	6.87	0.87	
SRT 4s	9/24/07	1348	2.0 Flood	3.2 98	51 718	7.3 103	441 12380	3.4 106	75 1056	1.01	33.58	18587	27.0	8.12	4.27	2.75	
SRT 4s	12/11/07	1048	0.8 Ebb	2.5 78	84 1182	1.2 16	299 8401	3.2 100	112 1563	0.84	13.71	7589	26.1	8.97	11.24	6.40	
SRT 4s	1/29/08	1101	0.6 Ebb	1.9 58	58 815	1.2 16	231 6479	2.7 85	80 1118	n/a	19.91	11021	26.7	8.36	13.67	21.89	
SRT 4s	2/28/08	951	0.4 Ebb	1.5 48	70 976	1.6 23	402 11286	2.0 61	76 1068	1.04	20.71	11464	26.7	8.36	11.84	38.44	
SRT 4s	2/28/08	2259	1.5 Ebb	2.4 74	85 1190	2.2 31	451 12673	2.4 73	88 1232	1.44	17.24	9543	26.1	8.48	15.07	39.93	
SRT 4s	4/2/08	1023	0.2 Flood	2.9 90	36 502	4.0 56	476 13380	2.0 61	94 1321	1.26	15.34	8491	24.6	8.28	8.40	20.13	
SRT 4s	4/16/08	1351	1.3 Flood	1.1 35	43 602	0.2 3	445 12493	2.7 83	64 893	0.99	15.45	8552	28.5	8.47	11.32	10.32	

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1/28/1992 - 6/30/2025

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SRT 4s	5/23/08	1012	0.0 Ebb	3.0 94	69 962	1.0 14	641 17990	3.1 95	80 1123	0.64	15.44	8546	25.1	8.37	7.92	0.11	
SRT 4s	6/12/08	1022	1.0 Flood	2.8 88	68 948	3.2 46	487 13688	2.9 89	77 1076	0.38	14.05	7777	24.5	7.91	7.22	5.45	
SRT 4s	7/18/08	935	-0.1 Low	3.1 97	69 967	1.1 15	494 13886	3.0 92	84 1182	0.52	17.32	9587	25.4	7.97	5.72	1.25	
SRT 4s	8/13/08	1039	0.7 Flood	3.6 111	73 1016	0.7 10	435 12231			1.68	14.74	8159	26.3	8.08	7.40	11.48	
SRT 4s	9/4/08	1045	1.3 Ebb	3.0 93	69 964	0.6 8	409 11501	5.1 157	103 1445	1.40	15.26	8447	25.8	8.15	6.42	1.53	
SRT 4s	10/20/08	1054	2.0 Ebb	4.2 129	85 1187	0.4 6	425 11927			0.87	16.85	9327	26.7	7.84	6.86	0.78	
SRT 4s	11/6/08	1039	1.8 High	5.8 180	135 1894	1.3 18	498 13990	9.3 288	287 4017	0.54	15.41	8530	25.7	8.28	8.06	0.69	
SRT 4s	1/2/08	1053	1.0 Ebb	2.7 83	40 566	0.1 2	72 2015	2.4 76	39 550	0.16	34.72	19218	11.7	7.85	9.51	0.98	
SRT 4s	1/12/09	1033	0.3 Ebb	2.8 87	40 557	0.1 2	71 1983	0.4 12	41 578	0.18	34.73	19224	11.3	7.84	9.03	0.06	
SRT 4s	2/20/09	941	0.3 Low	2.5 77	47 659	0.4 6	77 2162	2.3 72	41 575	0.15	34.62	19163	9.9	7.57	9.18	0.38	
SRT 4s	3/30/09	1440	0.3 Flood	2.1 65	41 571	0.5 8	75 2116	12.7 393	198 2775	0.24	34.49	19091	11.3	7.52	9.49	0.19	
SRT 4s	4/27/09	1109	-0.2 Flood	2.5 77	39 543	1.7 24	74 2076	3.3 102	53 736	0.07	34.37	19025	12.1	7.97	9.25	0.07	
SRT 4s	5/14/09	1432	0.5 Flood	3.0 93	40 554	1.9 26	67 1875	2.8 85	43 600	0.31	34.73	19224	11.9	7.40	8.81	0.08	
SRT 4s	6/10/09	840	0.2 Ebb	2.5 78	37 516	1.9 26	65 1830	3.1 96	47 657	0.09	34.45	19069	11.9	7.48	8.58	0.03	
SRT 4s	7/10/09	845	0.5 Ebb	2.7 83	39 541	1.9 26	72 2008	3.2 101	22 314	0.13	34.91	19324	10.1	7.68	9.58	0.17	
SRT 4s	8/27/09	909	1.8 Flood	2.2 67	30 419	1.3 19	52 1471	2.0 62	33 456	0.11	34.52	19108	11.0	7.66	6.70	0.10	
SRT 4s	9/17/09	1225	0.3 Flood	3.0 92	38 528	0.5 7	63 1758	2.9 90	42 591	0.54	34.59	19146	8.7	7.55	9.98	0.06	
SRT 4s	10/22/09	908	1.8 Ebb	2.4 75	42 588	1.0 15	184 5158	2.6 82	47 655	0.47	18.96	10495	25.8	7.65	3.09	5.91	
SRT 4s	11/19/09	856	1.7 Ebb	5.1 158	93 1309	4.6 64	356 9994	5.0 154	102 1431	0.50	16.47	9117	24.3	7.72	3.50	2.00	
SRT 4s	12/7/09	830	2.0 High	7.2 224	61 854	5.6 78	334 9367	7.0 218	71 996	0.52	23.33	12914	23.9	7.75	1.75	2.47	
SRT 4s	1/4/10	1416	0.0 Low	1.1 33	12 169	0.6 8	32 894	2.3 70	16 231	0.29	34.88	19307	19.4	8.16	9.61	0.60	
SRT 4s	2/2/10	1353	-0.2 Low	1.7 52	24 339	1.4 20	49 1388	2.0 61	27 384	0.33	34.65	19180	16.7	8.01	8.43	0.34	
SRT 4s	3/10/10	1308	0.7 High	1.7 53	25 344	0.2 3	51 1445	1.9 59	28 397	0.11	32.55	18017	16.8	7.96	7.84	0.89	
SRT 4s	4/5/10	958	0.4 High	1.9 58	24 340	2.2 31	74 2084	2.0 63	28 388	0.15	34.66	19185	15.5	8.08	7.94	0.15	
SRT 4s	5/12/10	1252	1.5 Flood	4.6 141	98 1372	1.5 21	454 12757	4.2 129	98 1371	0.30	17.55	9714	22.6	8.13	7.43	0.15	
SRT 4s	6/21/10	1018	1.3 Flood	1.7 52	24 334	0.7 10	55 1551	2.0 61	28 396	0.30	34.61	19158	16.0	7.92	7.45	1.07	
SRT 4s	7/12/10	1011	-0.1 Low	1.8 57	24 333	0.9 13	55 1554	2.0 62	27 384	0.90	34.81	19268	17.3	7.91	7.74	7.24	
SRT 4s	8/2/10	1219	1.3 Ebb	1.5 47	16 223	0.4 5.8	51 1434	1.5 47	20 281	0.13	34.53	19113	17.6	8.13	12.71	0.14	
SRT 4s	9/2/10	1143	1.9 Flood	1.7 52	22 313	0.4 6.2	44 1237	1.9 60	26 366	0.11	34.05	18848	17.3	7.99	8.39	0.24	
SRT 4s	10/19/10	1123	1.2 Flood	1.3 40	22 302	0.0 0.3	45 1250	1.4 45	24 341	0.21	34.69	19202	17.3	8.02	8.05	0.07	
SRT 4s	11/3/10	1001	0.6 Flood	1.8 56	21 300	1.1 15.5	48 1337	2.0 61	26 369	0.86	34.63	19169	17.4	7.98	7.52	5.50	
SRT 4s	12/6/10	937	0.7 Ebb	1.4 42	23 317	0.7 9.8	50 1392	1.8 57	27 381	0.13	34.47	19080	16.6	7.93	7.74	0.17	
SRT 4s	1/26/11	1014	0.8 Ebb	2.4 73	31 430	0.2 3.1	65 1833	2.6 82	37 515	0.16	34.54	19119	14.7	7.78	7.13	0.25	
SRT 4s	4/13/11	1014	0.4 Flood	1.7 52	24 331	0.4 5.0	53 1493	1.6 50	27 380	0.16	34.67	19191	16.3	7.93	7.26	0.14	
SRT 4s	7/18/11	935	0.6 Ebb	1.6 49	17 240	0.5 7.2	42 1185	1.7 52	23 327	25.6	34.45	19069	18.5	7.86	9.08	5.76	
SRT 4s	10/5/11	956	1.6 Flood	2.5 77	44 615	0.4 5.5	211 5925	3.1 96	52 723	1.25	27.78	15377	19.7	7.95	9.31	2.45	
SRT 4s	1/17/12	830	0.7 Flood	1.4 44	18 256	0.4 5.0	39 1088	1.7 54	23 315	0.29	34.54	19119	16.8	7.93	7.20	0.15	
SRT 4s	4/19/12	1043	0.3 Flood	1.7 53	22 310	0.7 9.7	45 1265	1.9 59	25 355	0.46	34.57	19135	15.5	7.94	8.22	0.08	
SRT 4s	7/9/12	1140	1.1 Ebb	1.8 55	28 386	0.3 3.7	59 1662	3.3 101	137 1915	1.50	35.29	19534	15.2	7.90	9.26	0.58	
SRT 4s	10/8/12	1047	1.8 High	0.8 26	11 148	0.2 3.2	33 918	1.2 39	18 257	0.26	35.05	19401	22.0	8.22	10.20	1.67	

NELHA Water Quality Laboratory

Seawater Return Trench 4

1/28/1992 - 6/30/2025

Site ID	Date (M/D/Y)	Time (2400)	Tide (ft) (cycle)	PO ₄ ³⁻ (μM) (μg P/L)	NO ₃ ⁻ & NO ₂ ⁻ (μM) (μg N/L)	NH ₄ ⁺ & NH ₃ (μM) (μg N/L)	Si (μM) (μg Si/L)	TDP (μM) (μg P/L)	TDN (μM) (μg N/L)	Turbidity (NTU)	Salinity (PSU)	Chloride (mg/L)	Temp. (°C)	pH (unit)	DO (ppm)	Chl a (μg/L)	ORP (mV)
SRT 4s	1/3/13	1020	1.2 Ebb	1.2 37	16 227	0.6 7.8	31 877	1.5 46	23 329	0.18	34.87	19301	17.5	8.25	11.23	0.85	
SRT 4s	4/1/13	1031	0.4 Ebb	1.3 40	17 240	0.4 5.4	37 1034	1.6 51	21 299	0.67	34.68	19196	19.1	8.06	7.90	0.65	
SRT 4s	7/8/13	1004	-0.1 Low	1.7 53	22 313	1.3 18.0	46 1285	1.9 58	35 486	0.48	34.87	19301	17.9	7.87	6.96	0.03	
SRT 4s	10/10/13	1119	1.7 Ebb	2.0 62	26 360	0.6 8.9	51 1432	2.2 67	30 420	0.72	34.77	19246	14.8	7.90	6.62	0.25	
SRT 4s	1/22/14	910	0.7 High	1.3 41	20 275	0.9 12.2	43 1211	1.6 50	30 417	0.61	34.95	19346	16.2	7.89	6.26	38.89	
SRT 4s	4/9/14	1057	0.7 Flood	1.4 44	22 306	1.3 18.1	49 1371	1.7 52	27 373	0.16	34.64	19174	16.4	7.85	6.20	0.15	
SRT 4s	7/16/14	1109	0.5 Ebb	1.5 47	24 337	1.8 24.6	39 1092	1.7 53	27 375	0.32	34.98	19362	17.4	7.92	7.25	0.08	
SRT 4s	10/15/14	1144	1.5 Ebb	1.5 46	32 450	1.9 26.1	40 1114	1.4 42	21 288	0.35	34.84	19285	18.0	7.93	6.24	0.12	
SRT 4s	2/3/15	812	0.5 Ebb	7.0 217	47 653	1.0 13.7	65 1832	6.0 187	23 326	8.22	34.88	19307	16.3	7.77	6.65	21.87	
SRT 4s	5/5/15	1709	2.0 High	1.3 41	19 270	1.9 27.0	32 906	1.7 52	30 418	0.61	34.57	19135	17.3	7.99	8.53	0.05	
SRT 4s	7/10/15	1016	1.4 Flood	1.5 46	25 350	0.5 7.1	39 1083	1.3 41.3	35 485	0.32	34.52	19108	19.7	8.06	9.95	1.18	
SRT 4s	11/5/15	1049	1.6 Flood	1.5 47	22 302	0.9 12.9	36 1014	1.8 56	31 436	0.24	34.35	19014	19.3	7.92	7.53	0.85	
SRT 4s	1/19/16	849	-0.2 Low	1.6 49	28 393	0.4 5.7	49 1378	2.1 64	39 553	0.61	34.24	18953	16.3	7.89	6.40	1.55	
SRT 4s	4/12/16	1053	0.2 Ebb	1.6 48	27 376	0.8 10.6	38 1069	2.2 67	30 417	1.19	34.69	19202	16.9	8.07	7.57	10.81	
SRT 4s	7/14/16	1045	1.4 Flood	1.2 37	16 229	0.6 8.0	32 913	1.7 53	24 343	0.38	34.52	19108	21.5	8.17	8.95	0.75	
SRT 4s	10/20/16	943	1.7 Ebb	1.8 56	29 399	0.5 7.1	59 1668	3.0 94	42 587	5.07	34.61	19158	19.4	8.08	7.11	4.05	
SRT 4s	2/23/17	1110	0.6 Flood	0.5 16	10 134	0.0 0.6	35 983	0.9 29	17 238	1.84	33.33	18449	21.1	8.13	8.45	23.19	
SRT 4s	4/10/17	1114	0.2 Flood	0.8 24	11 147	0.2 2.2	29 809	1.0 32	21 288	1.35	35.02	19384	20.4	8.21	9.67	49.71	
SRT 4s	7/13/17	957	0.4 Ebb	1.1 35	14 196	0.1 2.1	33 937	1.4 44	18 254	0.99	34.81	19268	19.5	7.99	6.46	9.76	
SRT 4s	10/12/17	905	2.0 High	1.3 40	18 250	0.2 3.5	39 1082	1.5 48	20 283	0.43	34.50	19097	19.5	7.92	6.95	0.38	
SRT 4s	1/11/18	940	1.0 Flood	1.7 53	28 394	0.0 0.3	61 1710	2.2 67	30 424	0.80	34.54	19119	11.8	7.78	8.04	11.01	
SRT 4s	4/24/18	946	0.7 Flood	2.0 62	29 401	5.2 72.2	62 1731	2.2 68	36 507	0.31	34.52	19108	14.5	7.77	8.19	0.20	
SRT 4s	7/12/18	1125	0.5 Flood	2.0 61	22 306	0.0 0.1	61 1719	2.2 69	29 411	0.29	33.26	18410	18.9	8.08	9.94	1.05	
SRT 4s	10/11/18	1052	0.4 Low	1.8 54	25 344	2.2 31.2	71 2000	2.3 72	35 490	0.69	32.74	18122	18.4	8.00	6.29	0.94	
SRT 4s	1/15/19	1056	1.2 High	2.2 69	28 393	0.1 1.1	69 1936	2.4 74	31 437	0.45	34.67	19191	13.6	7.80	9.13	1.38	
SRT 4s	4/25/19	1021	0.4 Ebb	2.2 68	31 437	7.1 99.6	67 1879	2.3 71	40 554	0.43	35.54	19672	13.4	7.39	9.69	0.10	
SRT 4s	7/17/19	1059	0.2 Flood	2.8 86	44 623	0.0 0.5	144 4052	3.1 97	47 657	0.50	31.48	17425	18.4	7.97	11.25	1.52	
SRT 4s	10/8/19	1400	1.9 High	4.1 127	99 1389	0.6 8.0	308 8642	4.3 132	104 1463	0.36	21.82	12078	23.9	7.92	8.06	0.16	
SRT 4s	1/9/20	1058	0.5 Low	5.3 163	120 1682	-0.2 -2.4	389 10937	5.5 172	121 1700	0.48	20.12	11137	21.4	7.91	6.76	0.46	
SRT 4s	5/21/20	1200	0.7 Flood	3.8 117	86 1208	1.4 20.2	341 9564	4.1 127.6	94 1323	0.63	17.86	9886	26.1	8.20	9.37	1.76	
SRT 4s	7/14/02	1132	0.4 High	4.1 128	88 1235	0.5 7.6	435 12231	4.0 125	84 1178	0.70	15.10	8358	27.3	8.43	12.85	3.23	
SRT 4s	10/14/20	1125	0.4 Flood	2.7 85	38 537	1.1 15.8	296 8326	2.9 90	60 843	3.00	16.18	8956	30.2	8.98	21.49	5.57	
SRT 4s	1/14/02	1115	0.3 Low	2.8 87	35 493	0.2 3.3	90 2531	2.5 78	42 583	2.72	34.26	18964	11.8	8.03	10.37	11.1	
SRT 4s	4/13/21	1136	0.0 Flood	4.1 128	83 1168	7.3 102.5	261 7344	4.4 137.4	110 1534	8.14	16.95	9382	27.8	8.98	23.02	4.84	
SRT 4s	7/1/21	1520	0.7 Low	3.2 98	53 744	1.8 25.0	245 6894	3.3 101	79 1101	1.81	18.16	10052	28.9	9.08	18.91	12.4	
SRT 4s	10/19/21	1424	1.7 High	5.8 180	97 1356	1.3 17.9	308 8654	5.7 177	115 1606	0.73	17.52	9698	28.0	8.56	16.19	0.82	
SRT 4s	2/3/22	1036	0.3 Ebb	6.1 189	116 1620	1.0 14.3	281 7899	6.4 198	138 1938	0.90	20.07	11109	21.7	8.17	8.66	4.73	
SRT 4s	4/12/22	1119	0.8 Flood	1.6 49	24 339	1.0 13.6	176 4934	2.2 68.3	46 648	2.64	25.01	13844	27.0	8.66	18.62	138	
SRT 4s	7/21/22	1130	1.5 High	1.4 42	20 285	0.5 7.4	46 1292	1.3 41.7	28 392	1.06	34.75	19235	17.3	8.10	11.10	3.84	
SRT 4s	10/12/22	1027	0.2 Low	3.4 107	55 777	1.5 20.4	352 9872	3.6 110.0	70 976	2.78	18.51	10246	26.2	8.36	13.95	11.9	

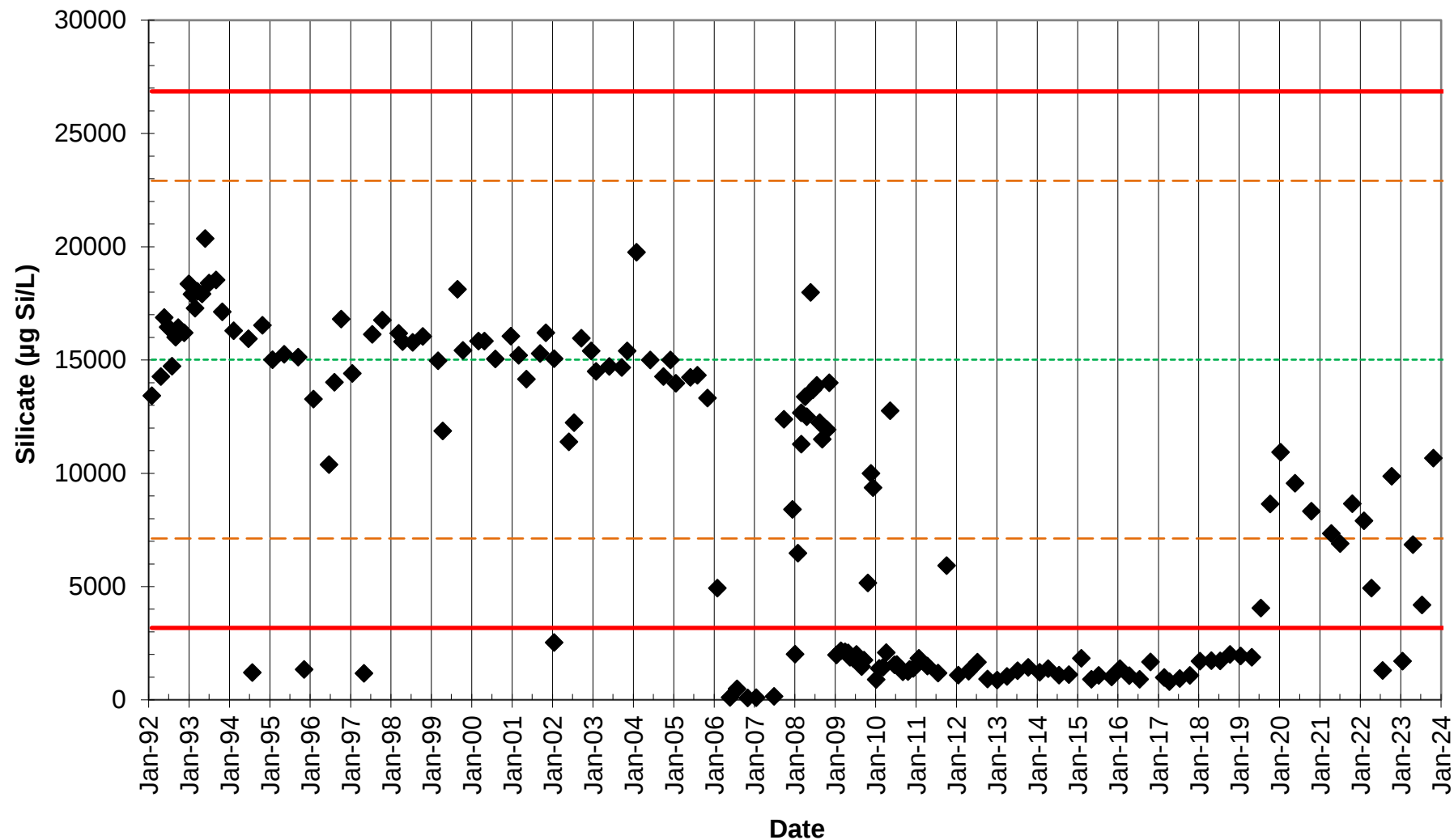
NELHA Water Quality Laboratory

Seawater Return Trench 4

1/28/1992 - 6/30/2025

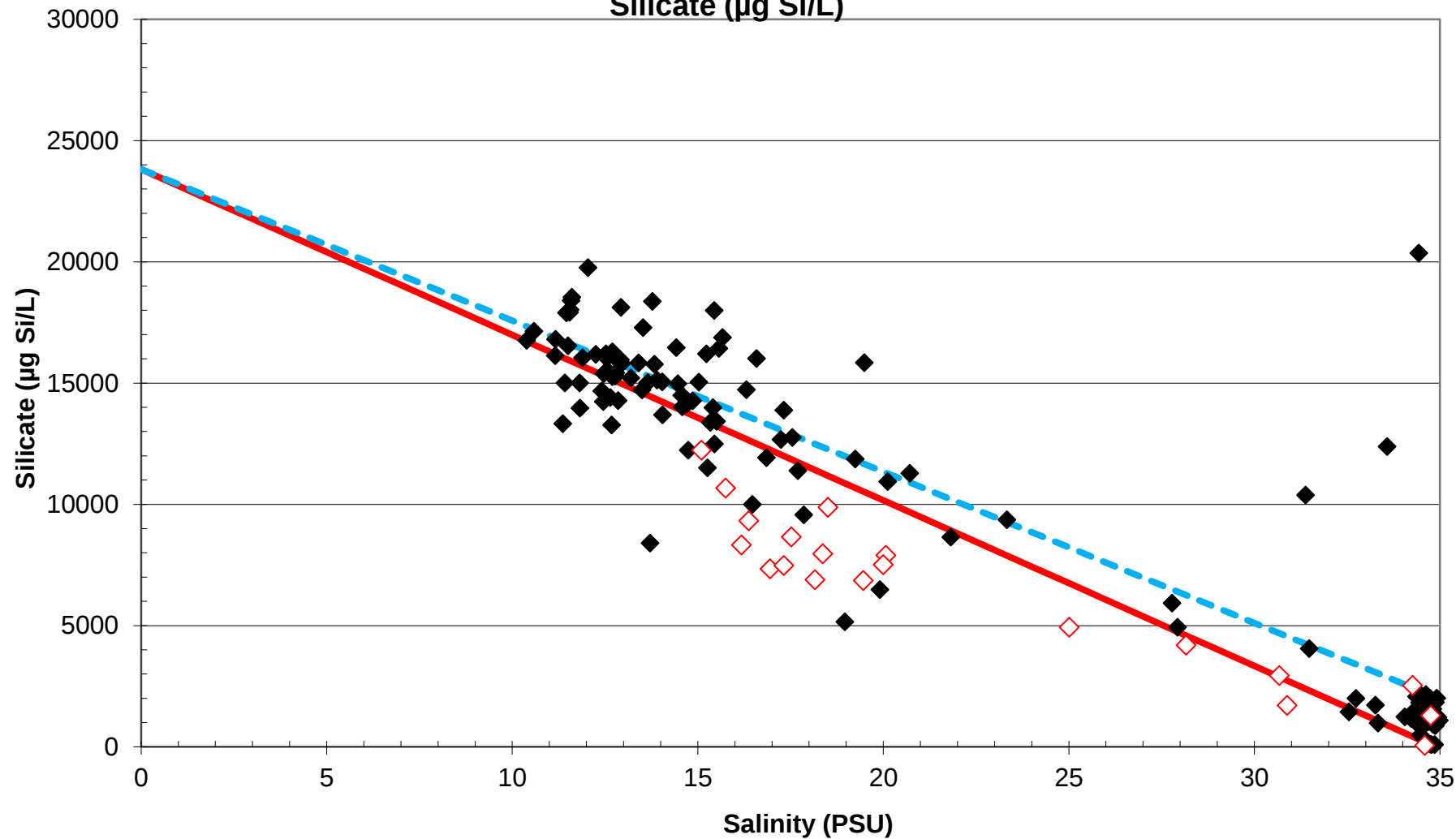
Site ID	Date (M/D/Y)	Time (2400)	Tide (ft) (cycle)	PO ₄ ³⁻ (µM) (µg P/L)	NO ₃ ⁻ & NO ₂ ⁻ (µM) (µg N/L)	NH ₄ ⁺ & NH ₃ (µM) (µg N/L)	Si (µM) (µg Si/L)	TDP (µM) (µg P/L)	TDN (µM) (µg N/L)	Turbidity (NTU)	Salinity (PSU)	Chloride (mg/L)	Temp. (°C)	pH (unit)	DO (ppm)	Chl a (µg/L)	ORP (mV)
SRT 4s	1/17/23	1038	1.0 High	0.8 24	5 76	0.5 7.6	61 1712	0.9 27.6	18 257	6.04	30.88	17093	22.2	8.66	17.64	18.0	
SRT 4s	4/21/23	1115	-0.1 Flood	0.9 28	9 130	1.7 23.9	244 6854	1.3 40.0	35 487	7.99	19.46	10772	29.8	8.92	21.85	23.20	
SRT 4s	7/12/23	1617	1.5 Ebb	2.1 64	38 530	0.8 10.6	149 4189	2.0 62	42 589	1.72	28.16	15587	22.2	8.12	9.66	1.54	
SRT 4s	10/24/23	1629	1.0 Ebb	3.4 104	82 1154	1.6 22.2	380 10666	3.5 108	102 1430	0.50	15.75	8718	28.4	8.59	16.00	0.31	
SRT 4s	1/11/24	1509	1.0 High	2.3 70	56 787	0.3 4.6	267 7509	2.3 70	64 892	0.52	20.00	11071	25.5	8.97	15.45	0.32	108.3
SRT 4s	4/2/24	1549	0.1 Low	2.9 88	85 1186	1.3 18.9	266 7476	2.9 91.1	96 1349	0.68	17.32	9587	28.4	9.05	22.90	0.53	125.8
SRT 4s	7/24/24	1047	0.1 Low	4.3 132	82 1145	2.1 30.1	283 7960	4.5 139	103 1448	1.60	18.37	10168	28.5	8.67	18.10	2.20	153.7
SRT 4s	10/4/24	1034	0.5 Low	7.5 232	117 1643	1.3 18.3	332 9322	7.4 230	107 1505	0.95	16.37	9061	25.5	8.51	13.58	0.61	197.0
SRT 4s	1/7/25	1015	1.4 High	2.2 68	35 489	0.4 6.2	105 2938	2.5 76	44 622	1.04	30.67	16977	15.6	8.02	8.89	9.32	161.5
SRT 4s	4/1/25	1109	-0.3 Low	0.0 1	2 28	0.5 7.0	2 55	0.1 1.6	11 160	2.11	34.59	19146	25.4	9.80	6.62	0.65	138.7
Mean			0.76	2.90 90	61.7 865	1.93 27	304 8538	3.20 99.2	73.1 1024	0.98	23.3	12936	21.5	8.11	8.82	5.04	147.5
Std. Dev.			1	1.95 61	53.9 755	5.28 74	234 6573	2.11 65.3	61.2 857	2.33	9.8	5451	4.82	0.32	3.46	12.95	30.89
Maximum			2.10	12.5 387	465 6515	46.5 651	725 20362	12.7 393	477 6677	25.6	35.5	19672	30.2	9.80	23.0	138.0	197.0
Minimum			-0.32	0.03 1	1.98 28	-0.17 -2	1.97 55.2	0.1 1.6	11.43 160	0.06	10.4	5751	8.65	7.39	1.60	0.00	108.3
n			169	168 168	168 168	168 168	168 168	166 166	166 166	163	169	168	170	169	164	169	6

Seawater Return Trench 4 Silicate ($\mu\text{g Si/L}$)



♦ SRT 4s (n=168, Control Chart 1992 - 2001) +3s (26858 $\mu\text{g Si/L}$) +2s (22911 $\mu\text{g Si/L}$) Mean (15017 $\mu\text{g Si/L}$) -2s (7122 $\mu\text{g Si/L}$) -3s (3175 $\mu\text{g Si/L}$)

Seawater Return Trench 4
Conservative Mixing Model
Silicate ($\mu\text{g Si/L}$)



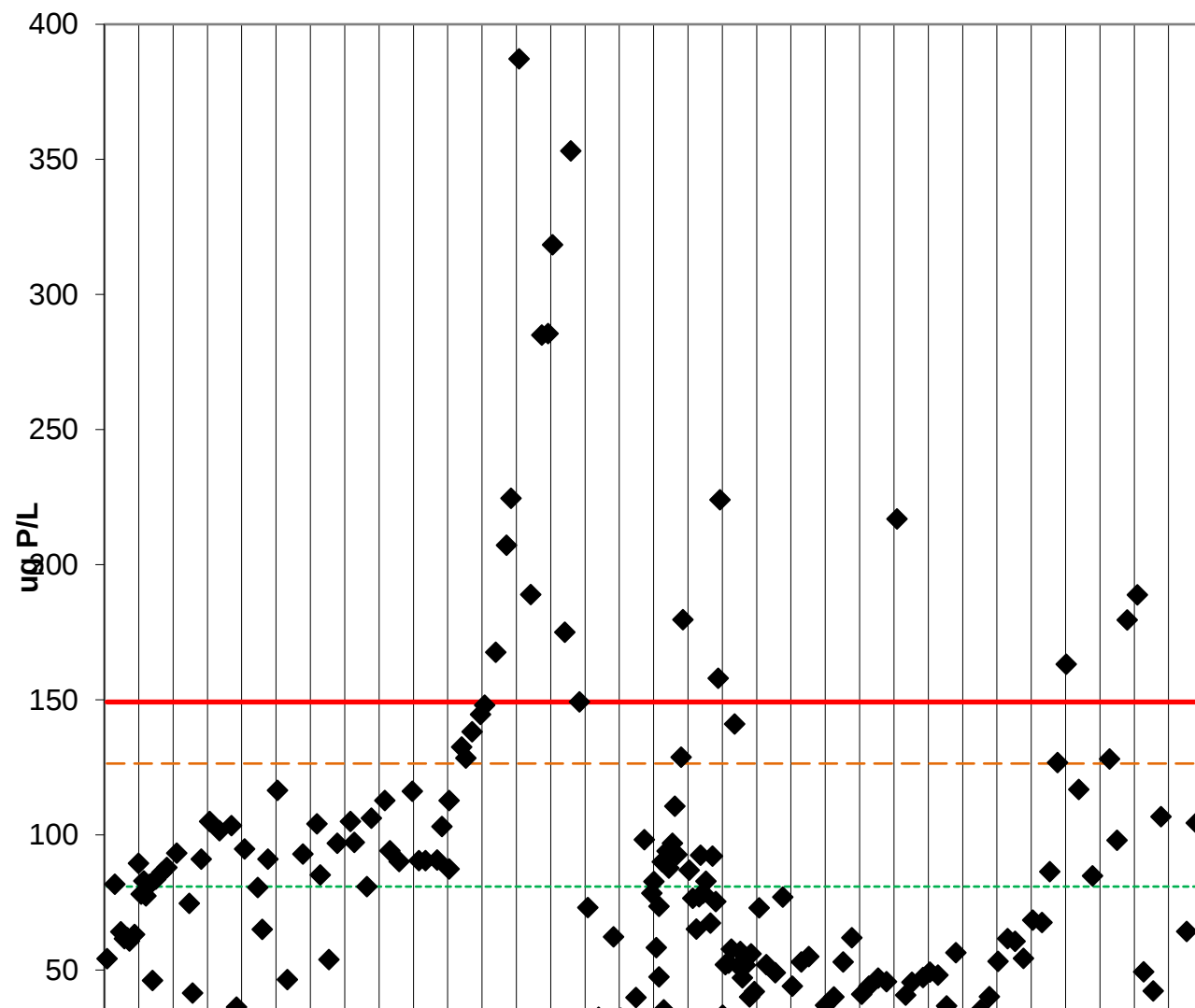
◆ Seawater Return Trench 4, 1992 - 2020

◇ Seawater Return Trench 4, 2020 - 2021

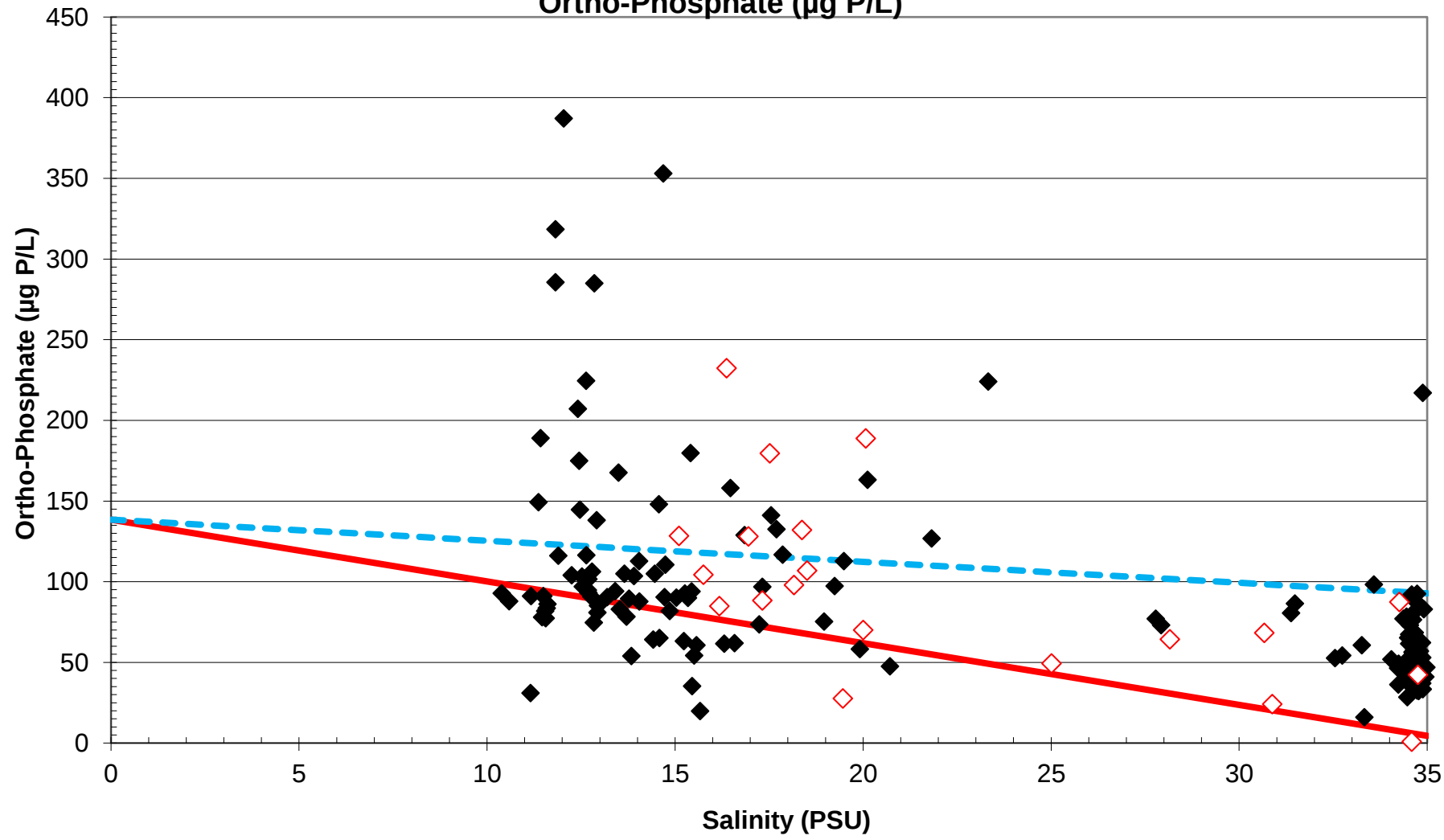
— W1-SSW Mixing Line

- - - W1-DSW Mixing Line

Seawater Return Trench 4 Ortho-Phosphate

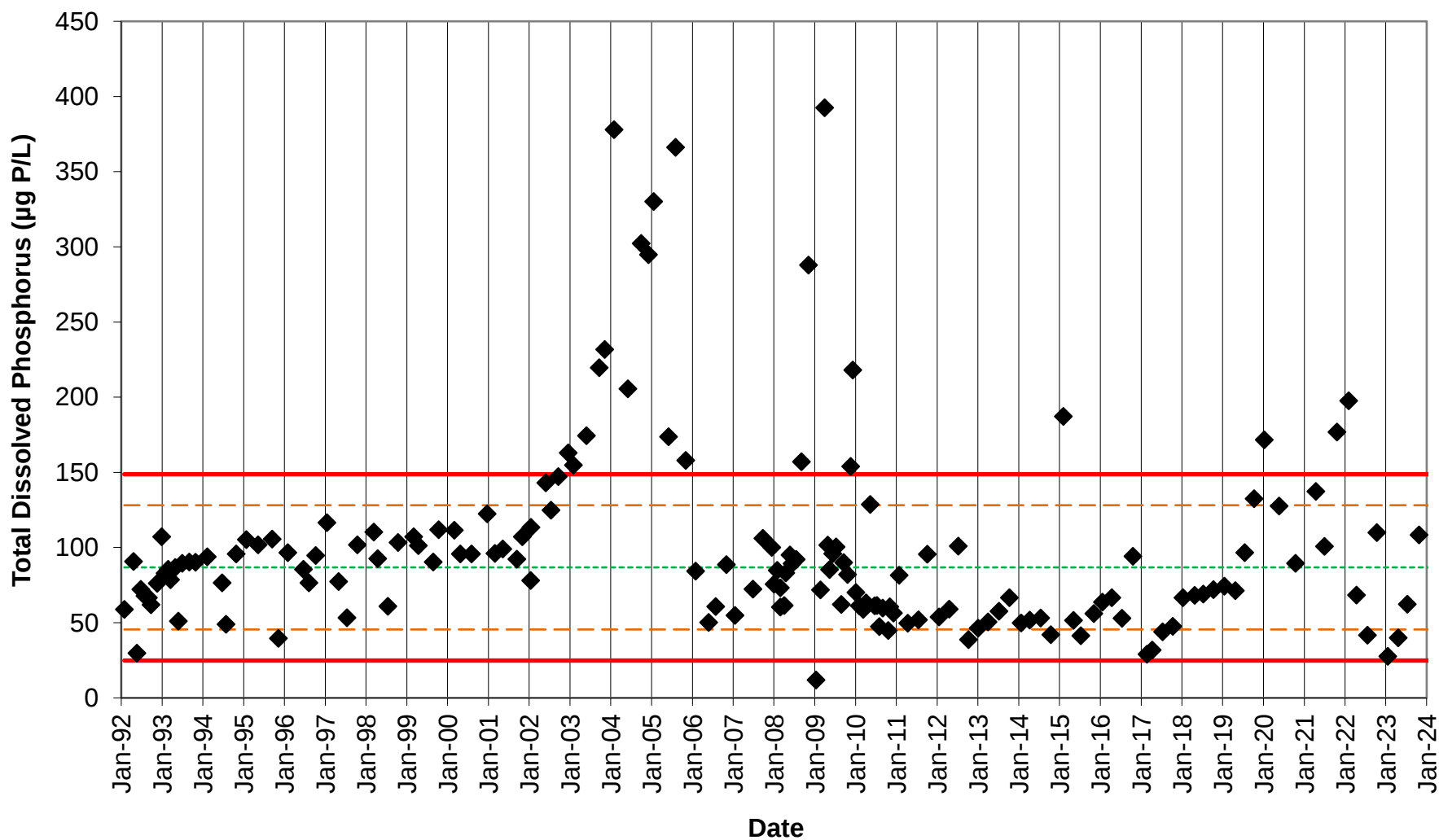


Seawater Return Trench 4
Conservative Mixing Model
Ortho-Phosphate ($\mu\text{g P/L}$)



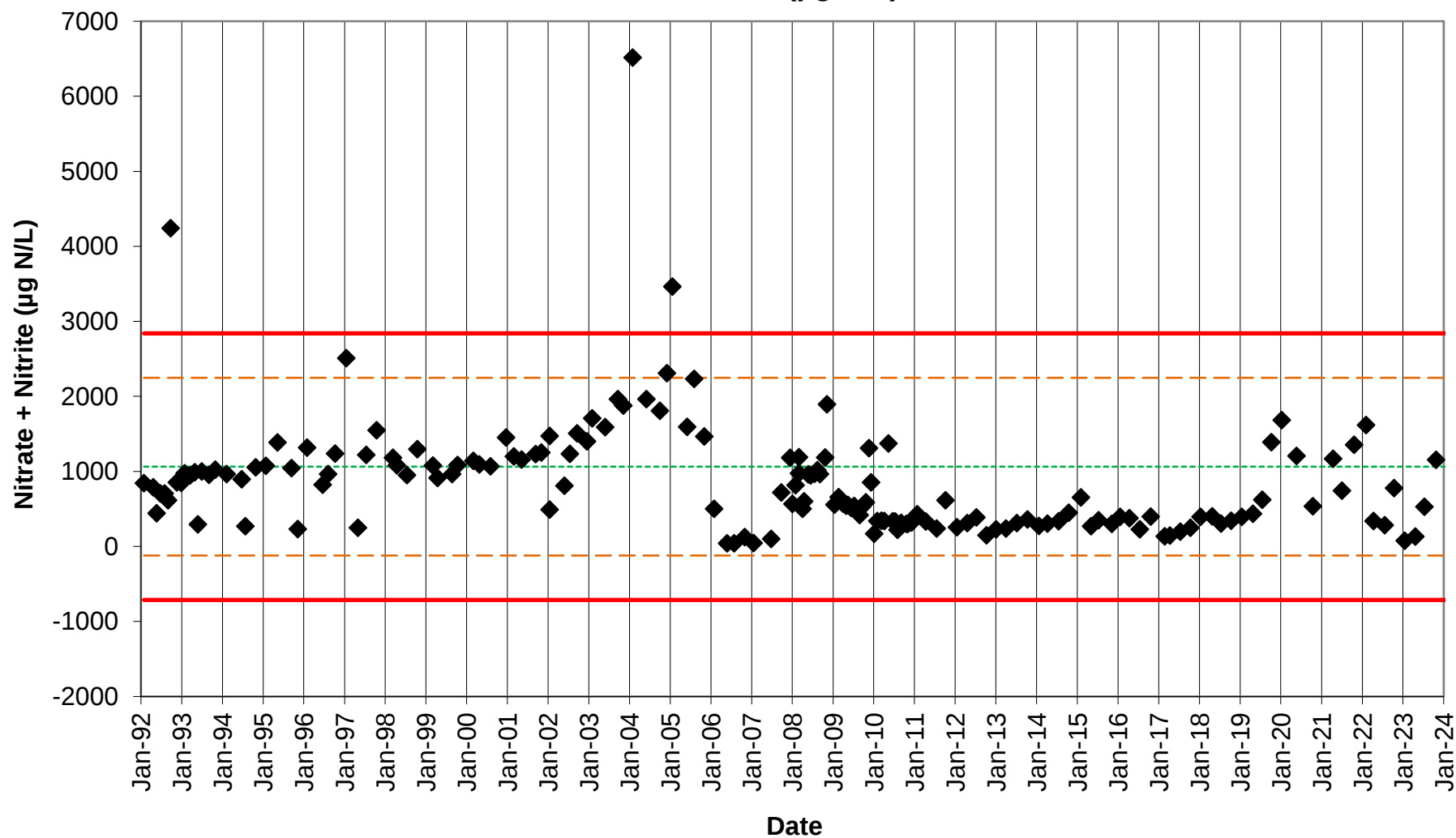
◆ Seawater Return Trench 4, 1992 - 2020 ◇ Seawater Return Trench 4, 2020 - 2021 — W1-SSW Mixing Line - - - W1-DSW Mixing Line

Seawater Return Trench 4 Total Dissolved Phosphorus ($\mu\text{g P/L}$)



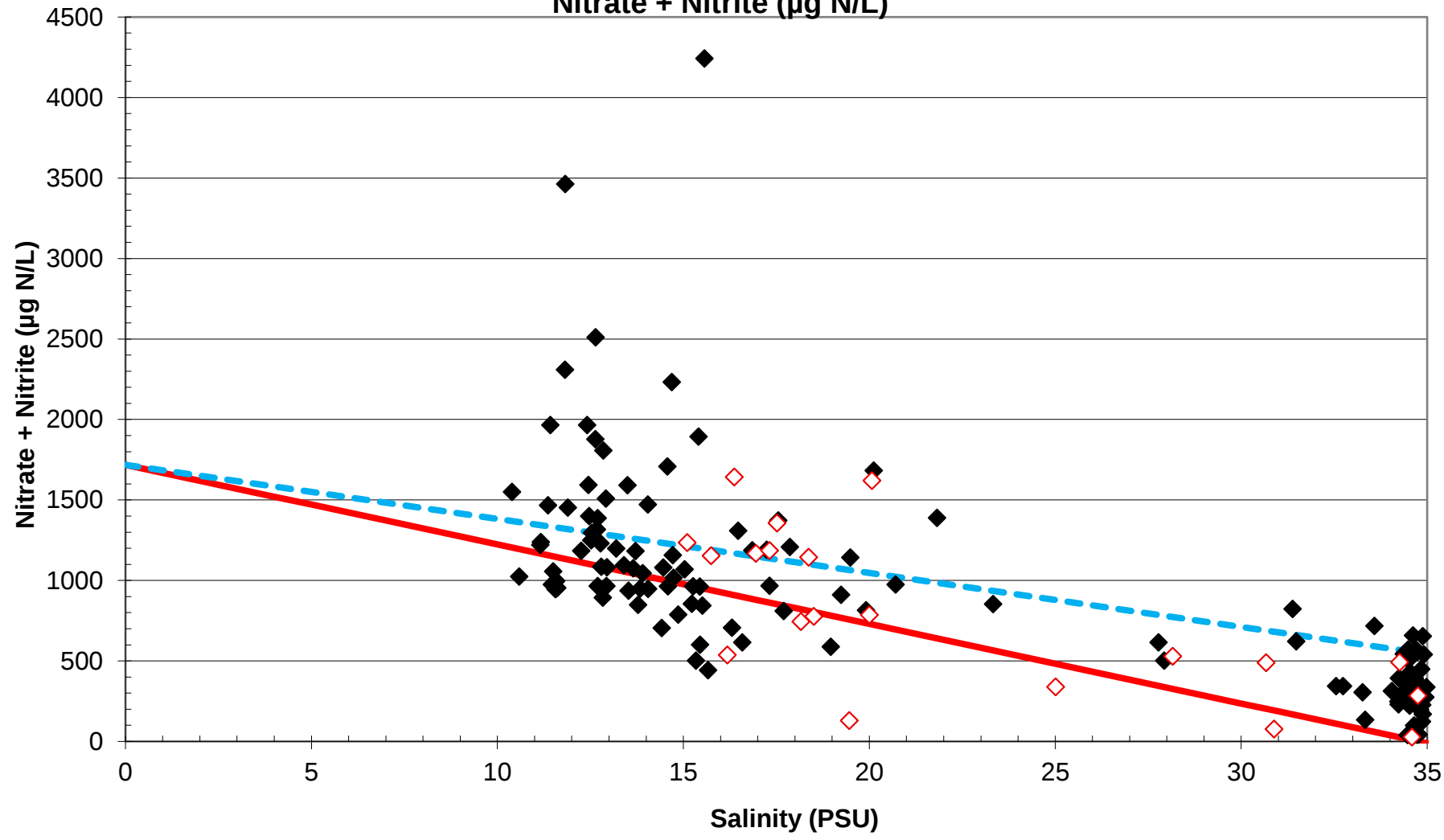
◆ SRT 4s (n=166, Control Chart 1992 - 2001) —+3s (149 $\mu\text{g P/L}$) - -+2s (128 $\mu\text{g P/L}$) - - - Mean (87 $\mu\text{g P/L}$) - - -2s (46 $\mu\text{g P/L}$) —-3s (25 $\mu\text{g P/L}$)

Seawater Return Trench 4 Nitrate + Nitrite ($\mu\text{g N/L}$)



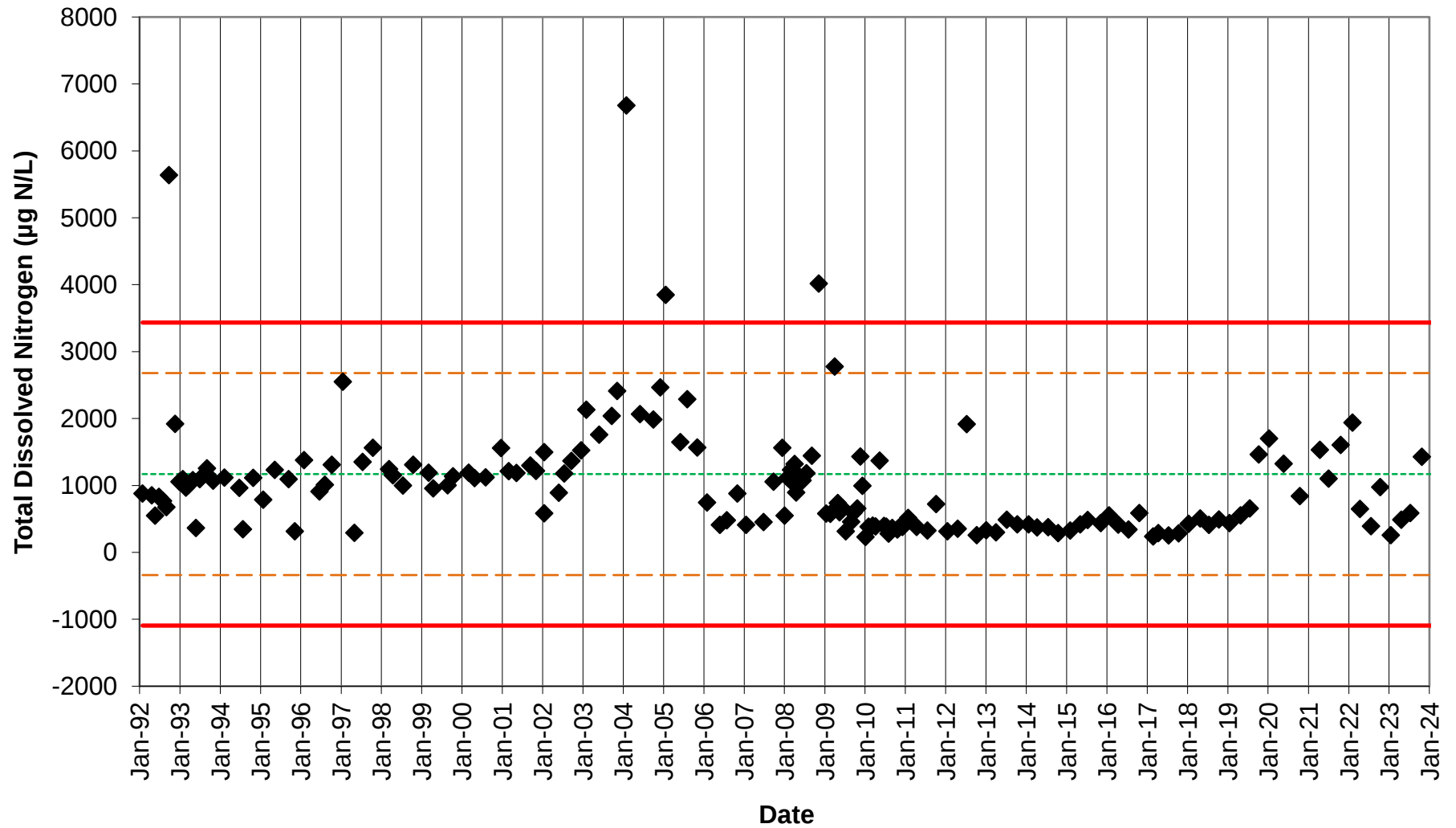
◆ SRT 4s (n=168, Control Chart 1992 - 2001) — +3s (2840 $\mu\text{g N/L}$) - - +2s (2248 $\mu\text{g N/L}$) - - - Mean (1063 $\mu\text{g N/L}$) - - -2s (-121 $\mu\text{g N/L}$) — -3s (-713 $\mu\text{g N/L}$)

Seawater Return Trench 4
Conservative Mixing Model
Nitrate + Nitrite ($\mu\text{g N/L}$)



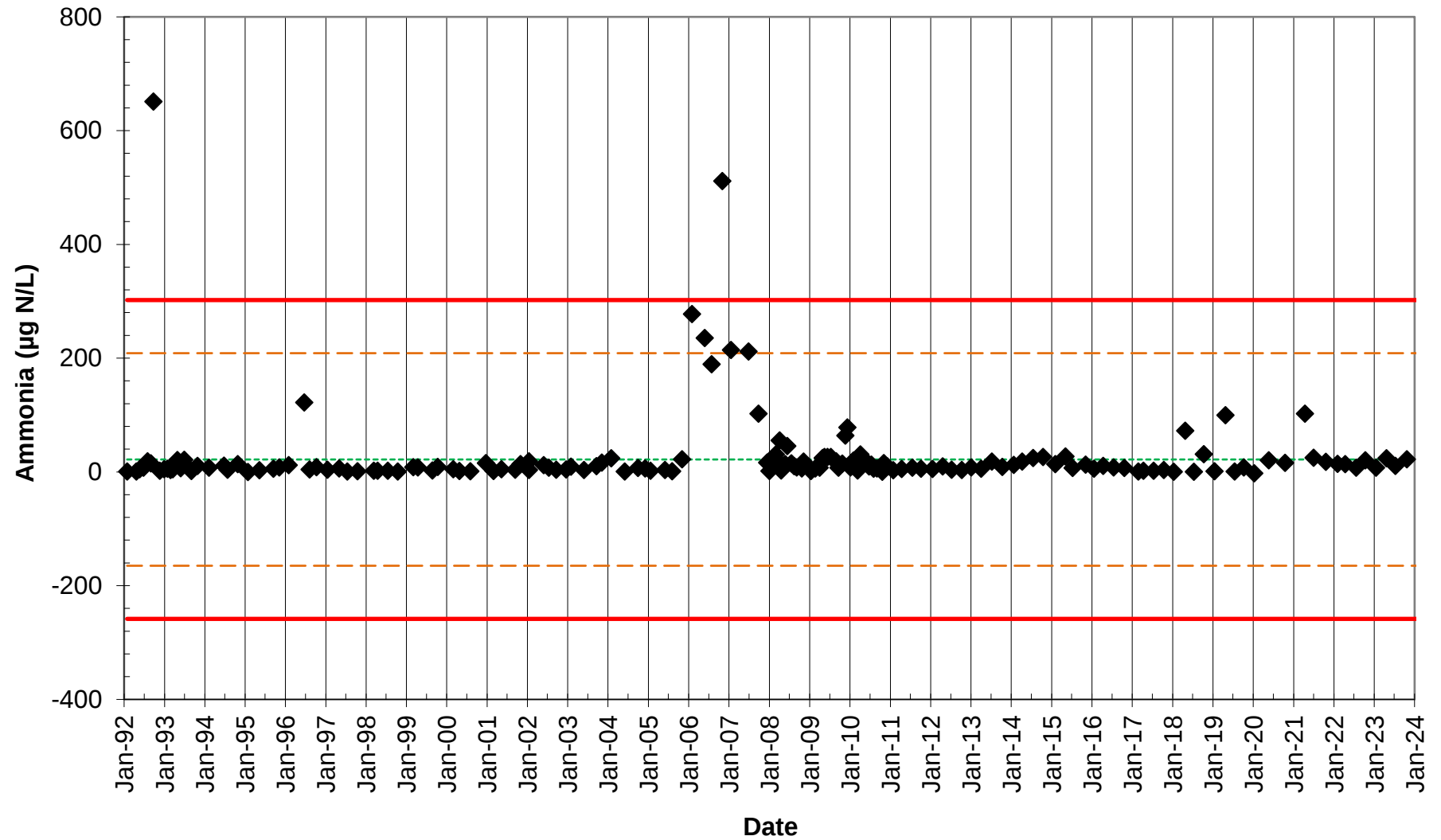
◆ Seawater Return Trench 4, 1992 - 2020 ◇ Seawater Return Trench 4, 2020 - 2021 — W1-SSW Mixing Line - - - W1-DSW Mixing Line

Seawater Return Trench 4 Total Dissolved Nitrogen (µg N/L)



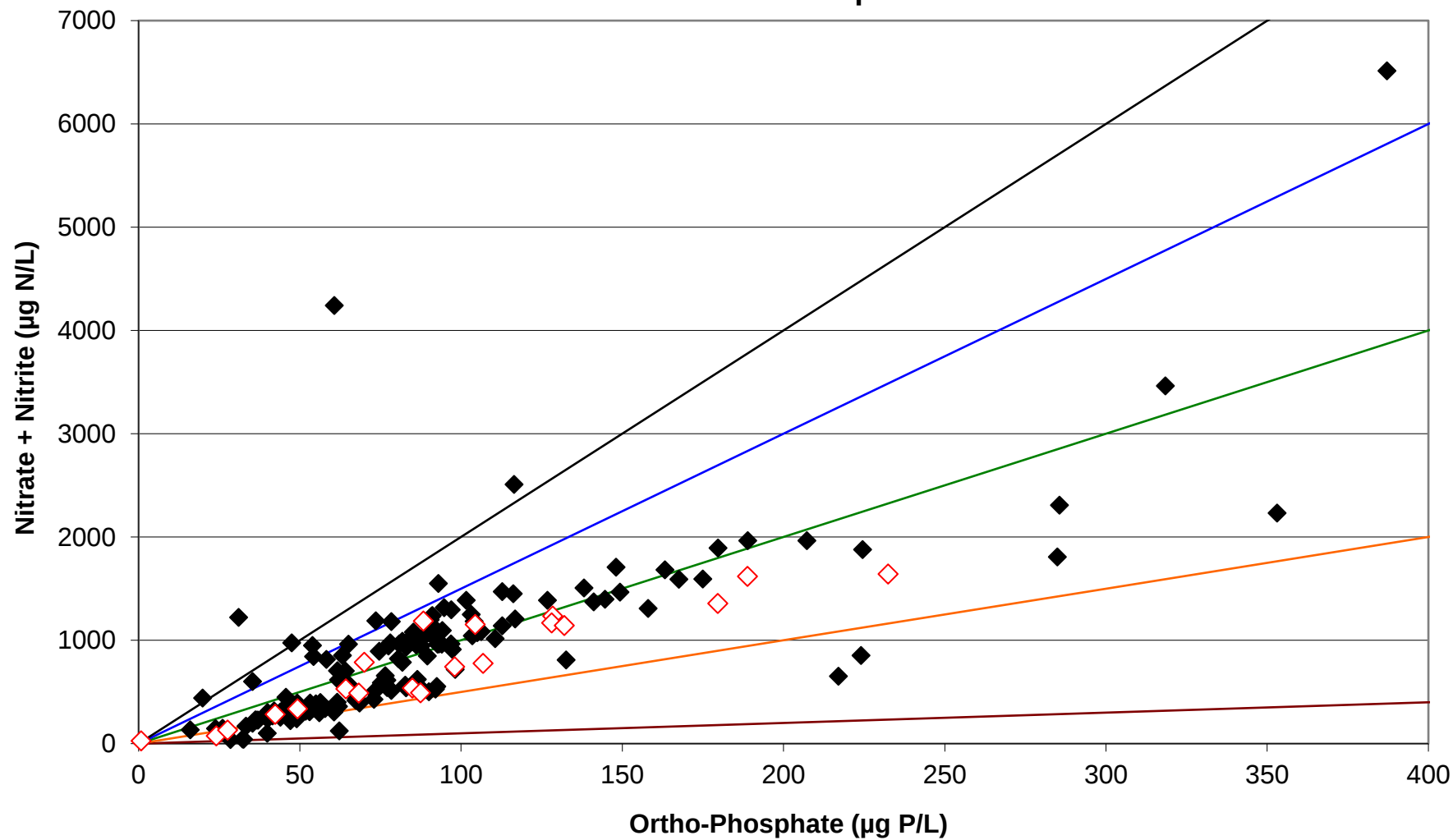
♦ SRT 4s (n=166, Control Chart 1992 - 2001) +3s (3434.1 µg N/L) +2s (2679.3 µg N/L) Mean (1169.9 µg N/L) -2s (-339.5 µg N/L) -3s (-1094.2 µg N/L)

Seawater Return Trench 4 Total Ammonia (µg N/L)



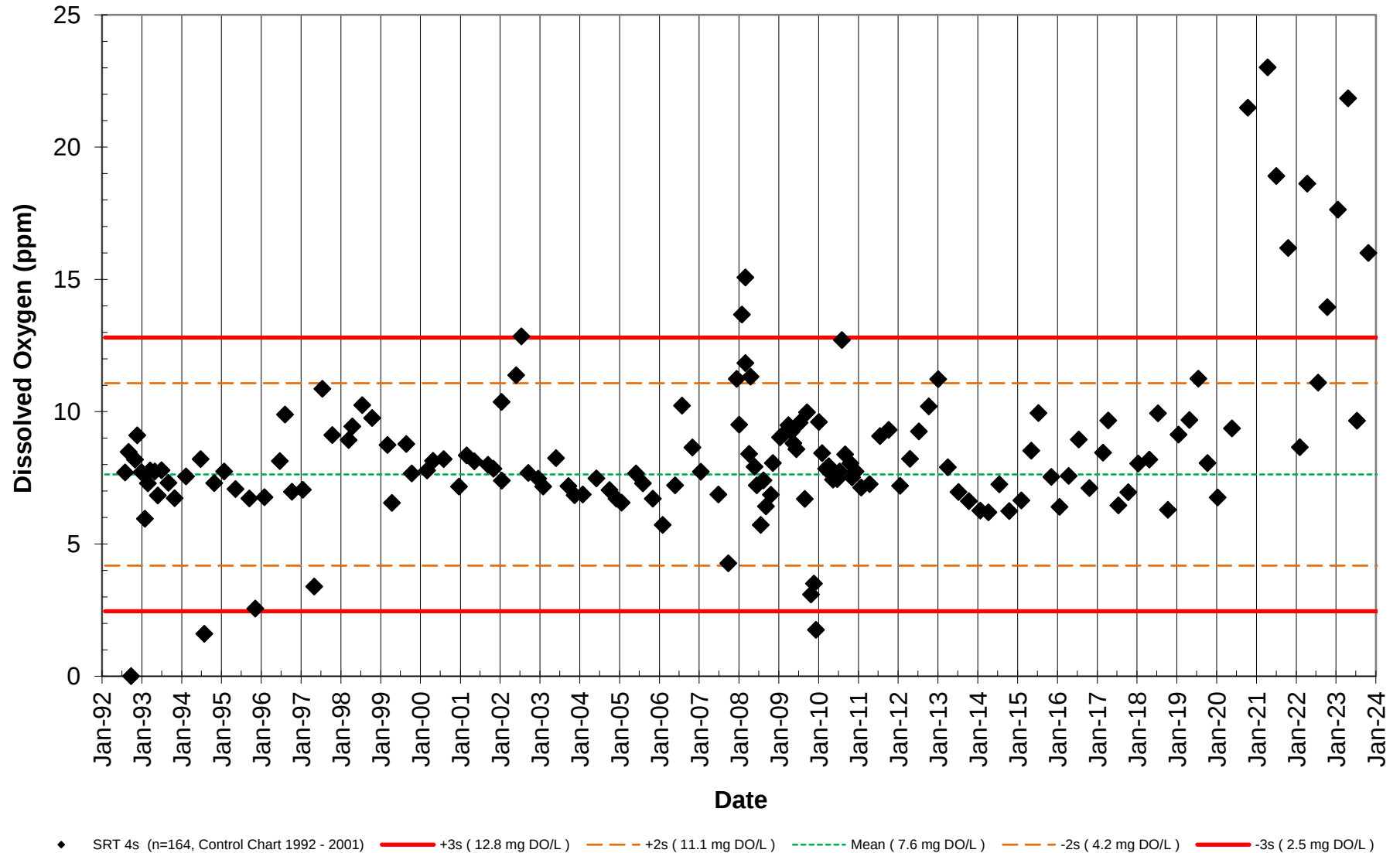
◆ SRT 4s (n=168, Control Chart 1992 - 2001) +3s (302.1 µg N/L) +2s (208.7 µg N/L) - - - - Mean (21.9 µg N/L) - - - - -2s (-165.0 µg N/L) -3s (-258.4 µg N/L)

Seawater Return Trench 4 Nitrate + Nitrite to Ortho-Phosphate Ratio

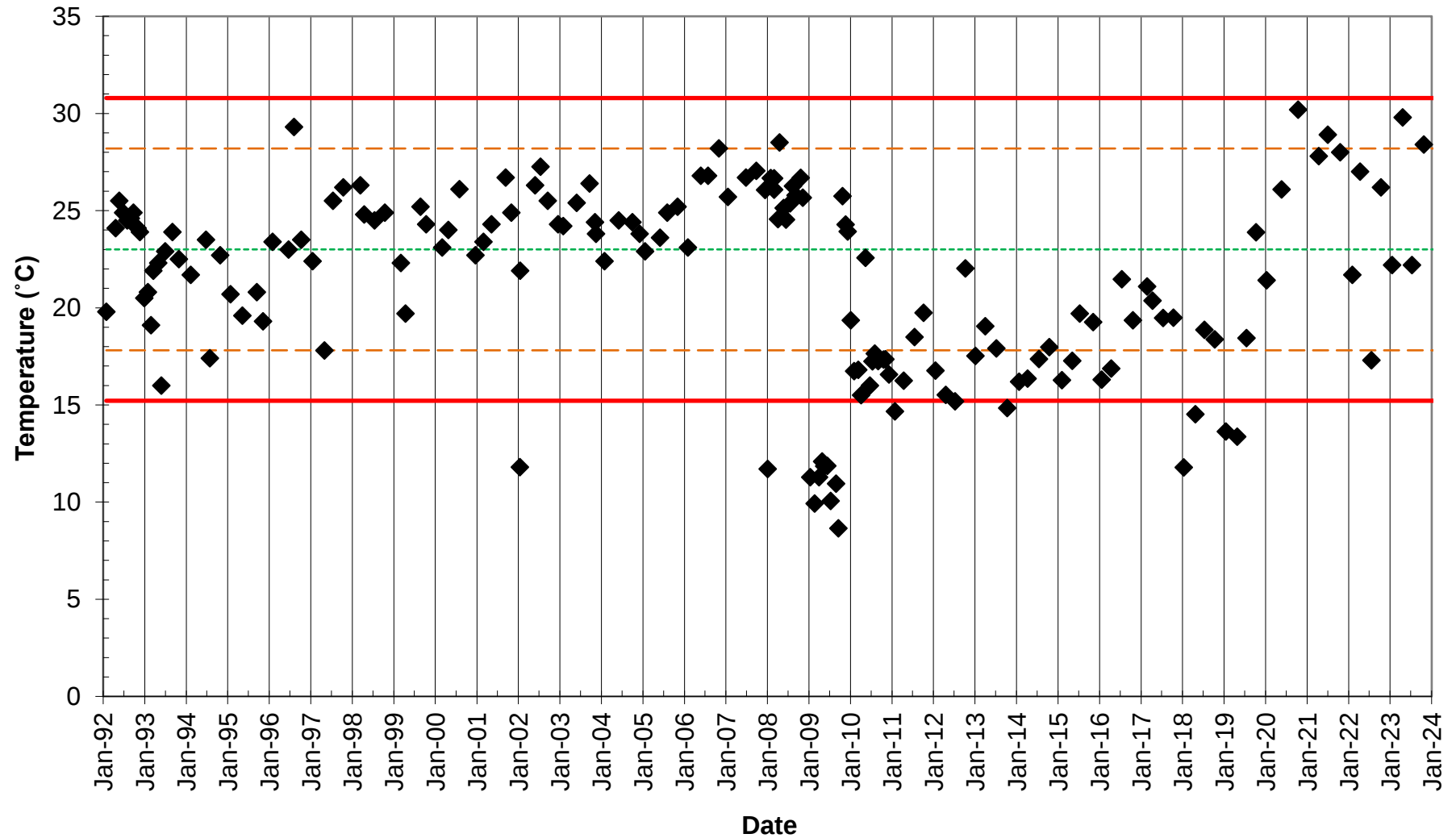


◆ Seawater Return Trench 4, 1992 - 2020 ◇ Seawater Return Trench 4, 2020 - 2021 — 1:1 — 5:1 — 10:1 — 15:1 — 20:1

Seawater Return Trench 4 Dissolved Oxygen (ppm)



Seawater Return Trench 4 Temperature (°C)



◆ SRT 4s (n=170, Control Chart 1992 - 2001)

— +3s (30.8 °C)

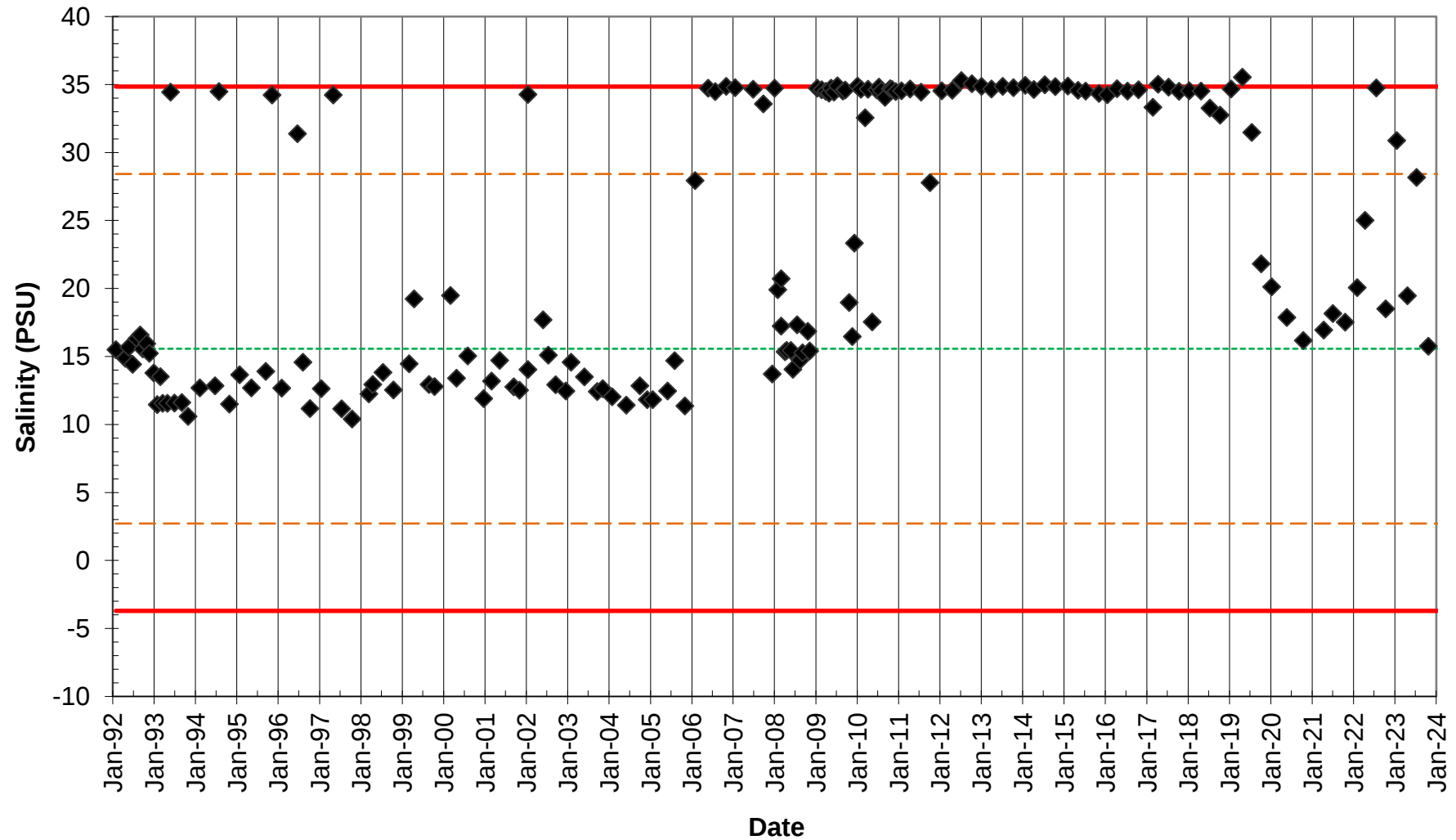
- - - +2s (28.2 °C)

- - - Mean (23.0 °C)

- - - -2s (17.8 °C)

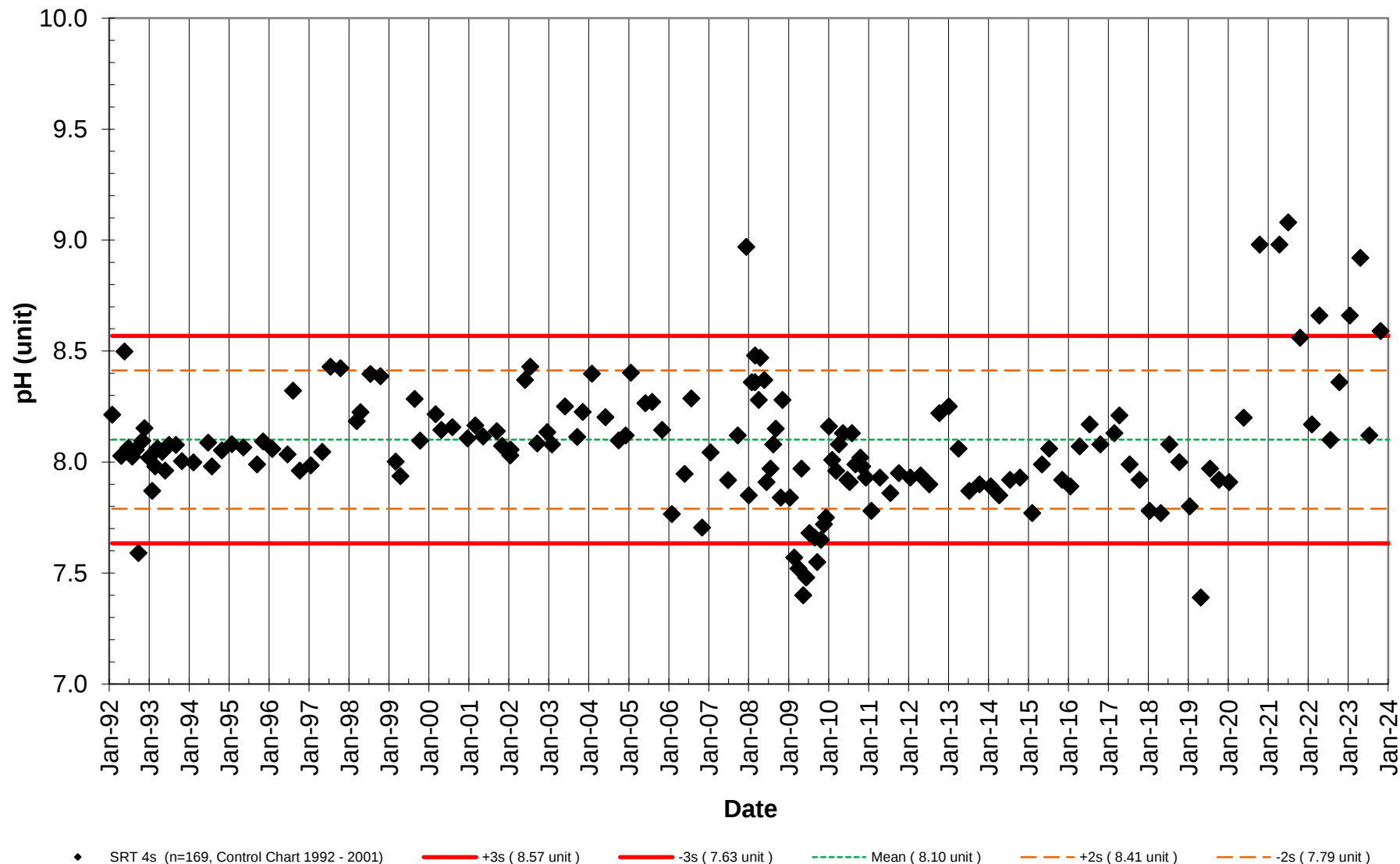
— -3s (15.2 °C)

Seawater Return Trench 4 Salinity (PSU)

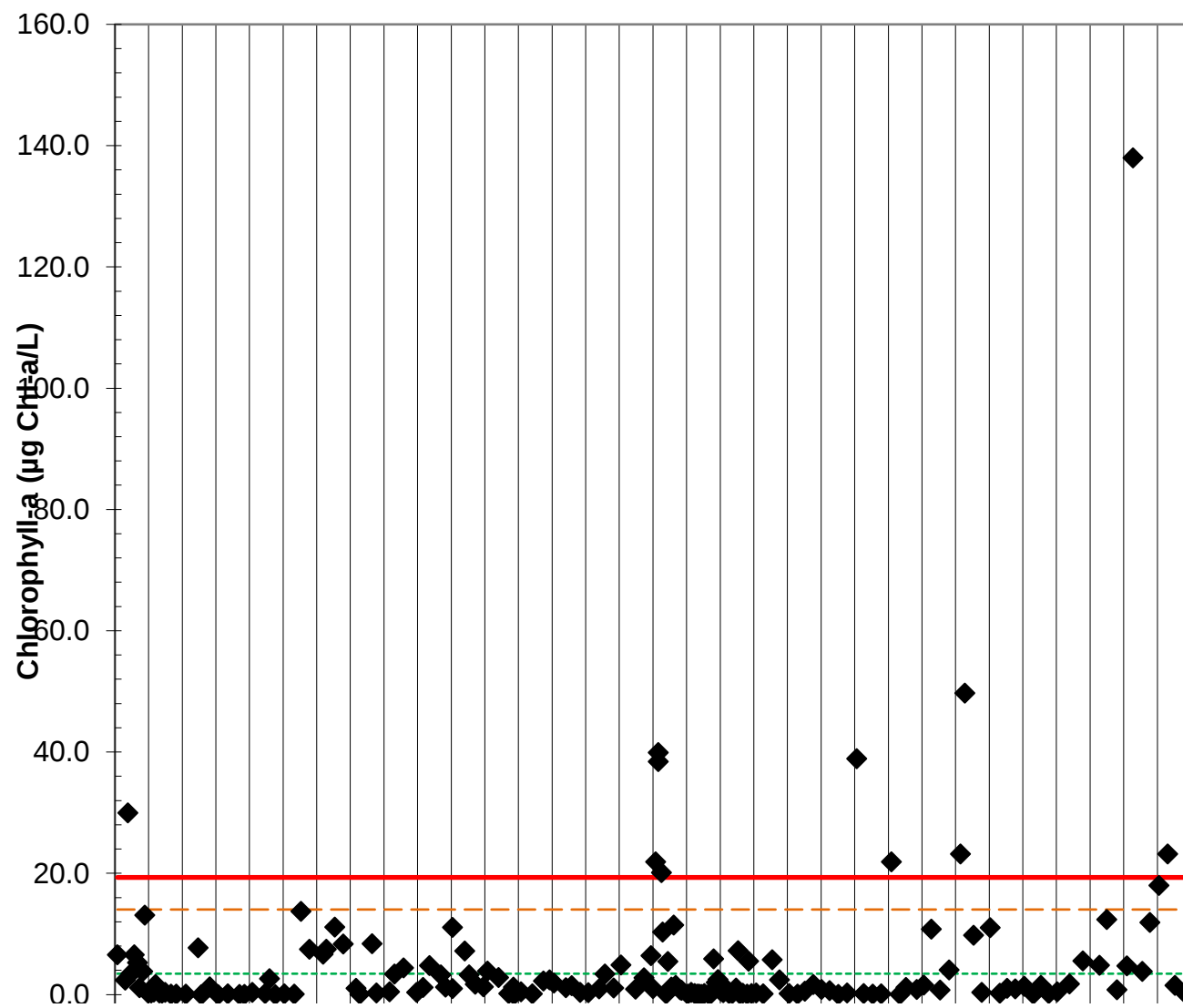


◆ SRT 4s (n=169, Control Chart 1992 - 2001) — +3s (34.8 PSU) - - - +2s (28.4 PSU) - - - Mean (15.6 PSU) - - - -2s (2.7 PSU) — -3s (-3.7 PSU)

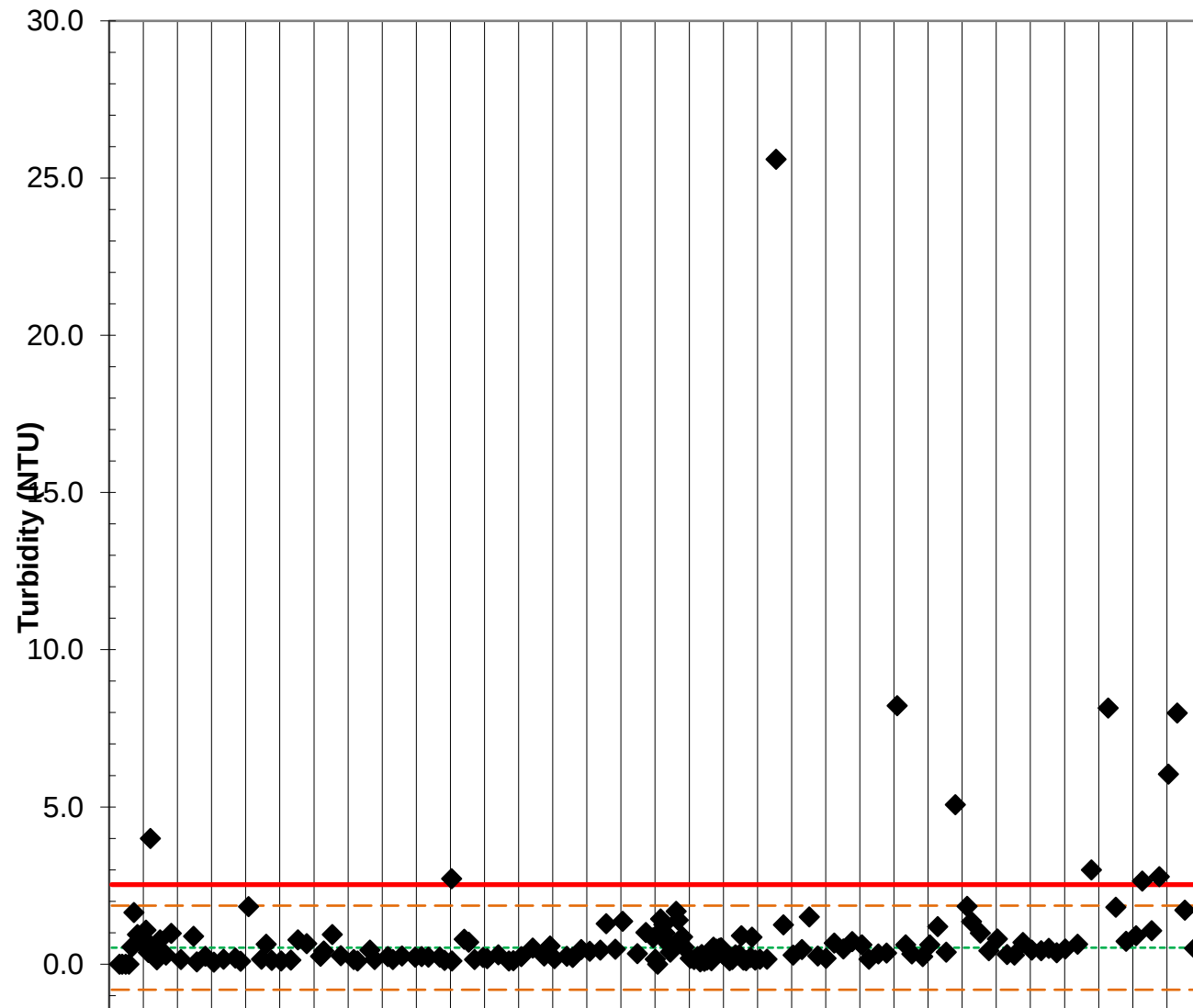
Seawater Return Trench 4 pH (unit)

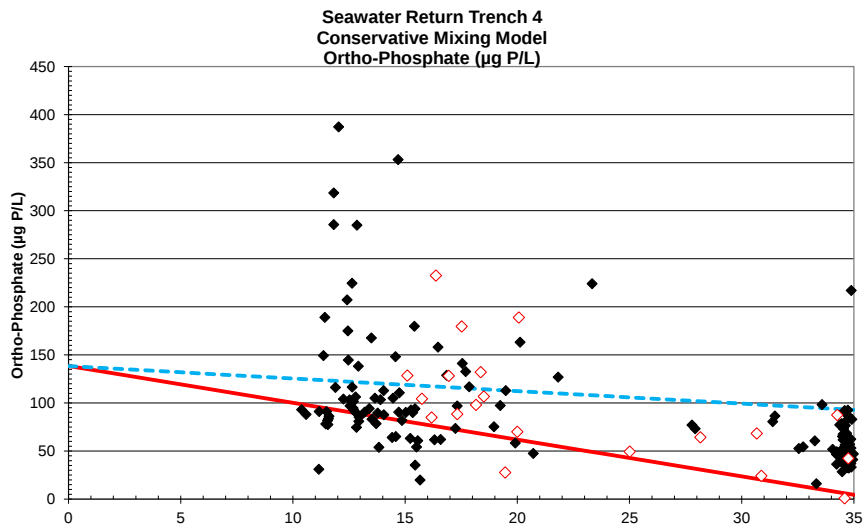
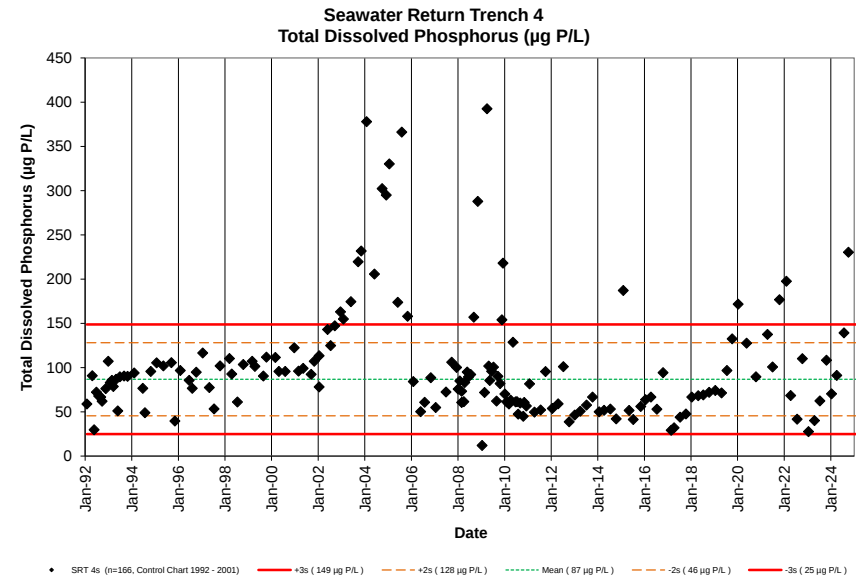
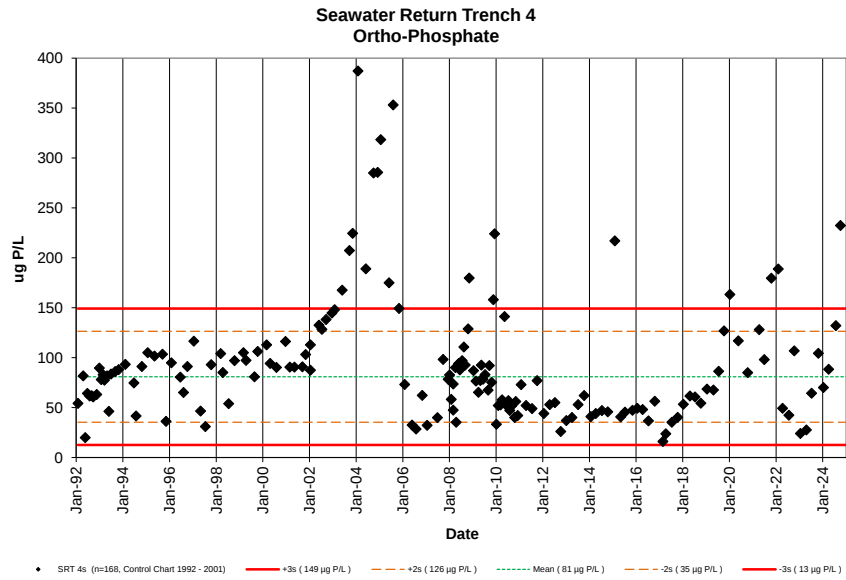


Seawater Return Trench 4
Chlorophyll-a ($\mu\text{g Chl-a/L}$)



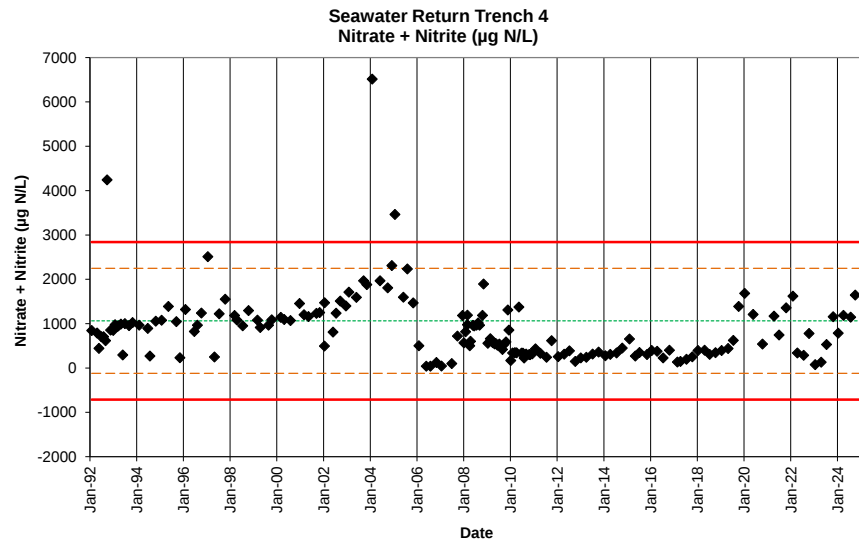
Seawater Return Trench 4 Turbidity (NTU)



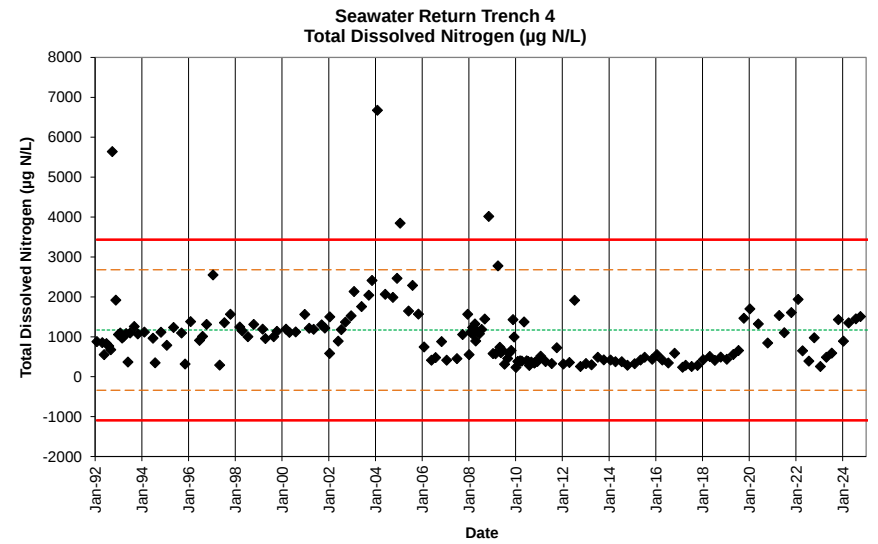


Salinity (PSU)

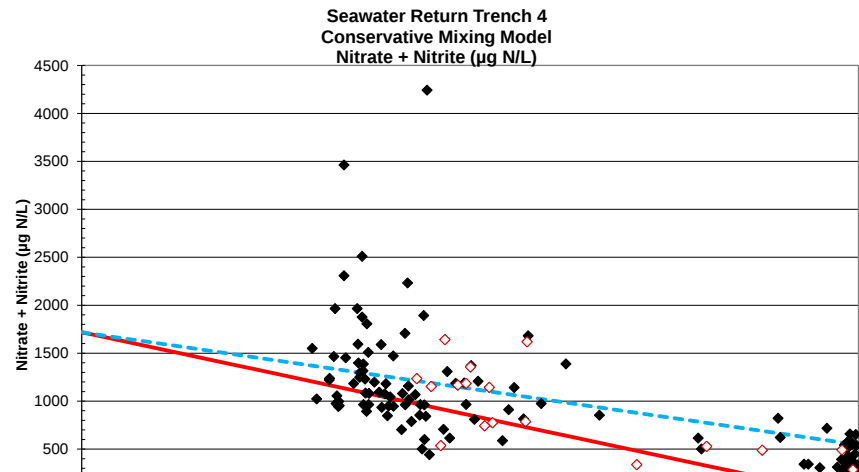
• Seawater Return Trench 4, 1992 - 2020 • Seawater Return Trench 4, 2020 - 2021 — W1-SSW Mixing Line - - - W1-DSW Mixing Line

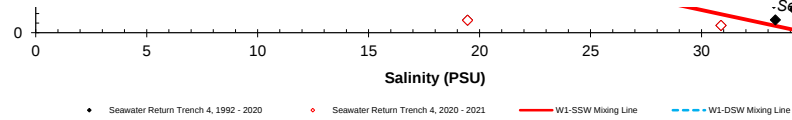


• SRT 4s (n=168, Control Chart 1992 - 2001) — +3s (2840 $\mu\text{g N/L}$) - - - +2s (2248 $\mu\text{g N/L}$) - - - Mean (1063 $\mu\text{g N/L}$) - - - -2s (-121 $\mu\text{g N/L}$) — -3s (-713 $\mu\text{g N/L}$)

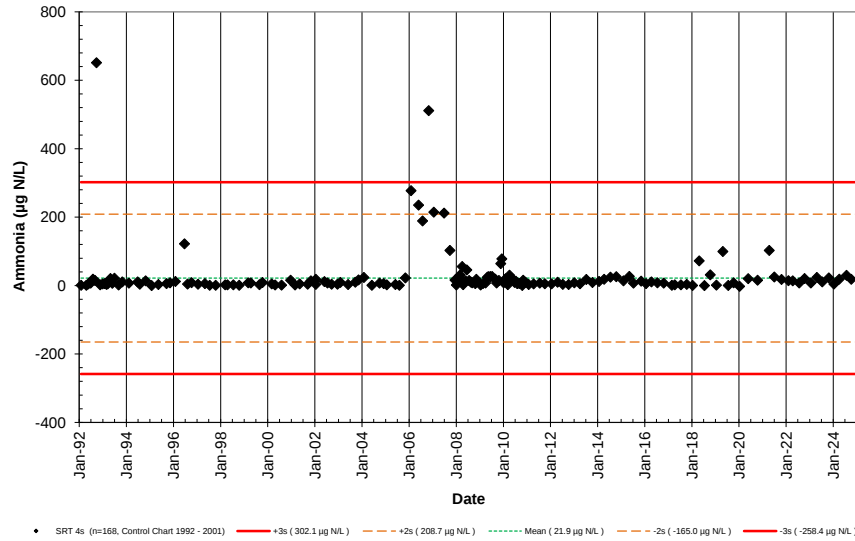


• SRT 4s (n=166, Control Chart 1992 - 2001) — +3s (3434.1 $\mu\text{g N/L}$) - - - +2s (2679.3 $\mu\text{g N/L}$) - - - Mean (1169.9 $\mu\text{g N/L}$) - - - -2s (-339.5 $\mu\text{g N/L}$) — -3s (-1094.2 $\mu\text{g N/L}$)

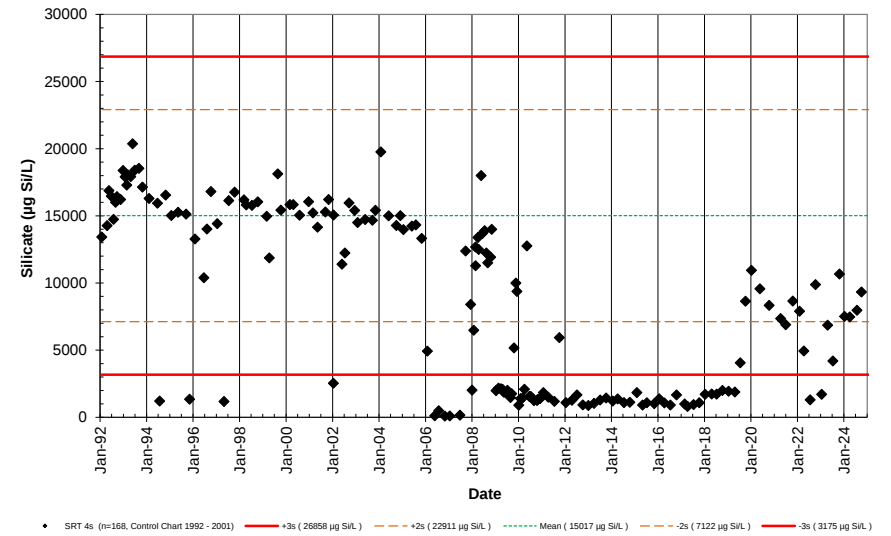




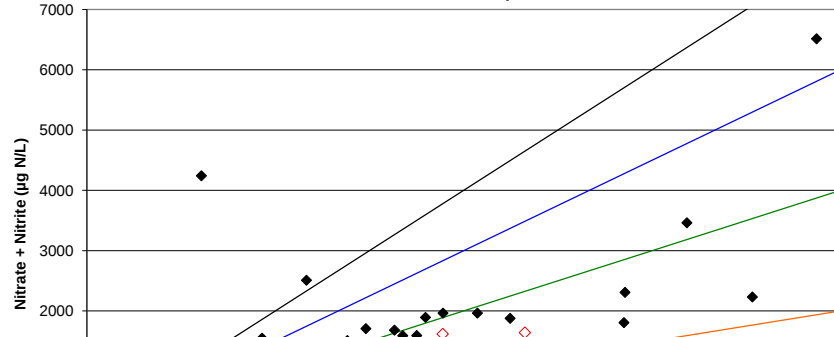
Seawater Return Trench 4
Total Ammonia ($\mu\text{g N/L}$)



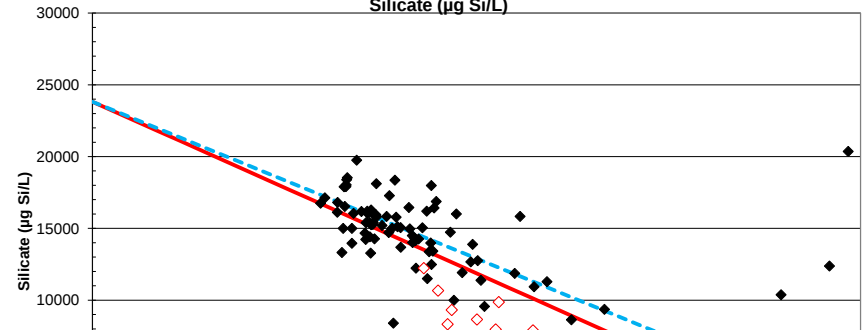
Seawater Return Trench 4
Silicate ($\mu\text{g Si/L}$)

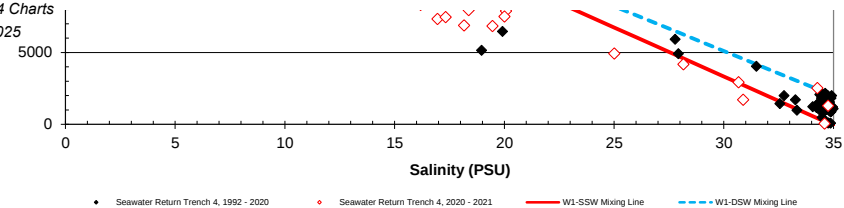
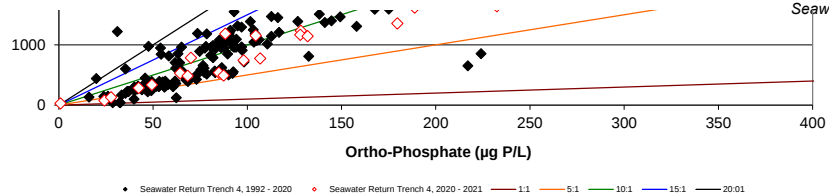


Seawater Return Trench 4
Nitrate + Nitrite to Ortho-Phosphate Ratio

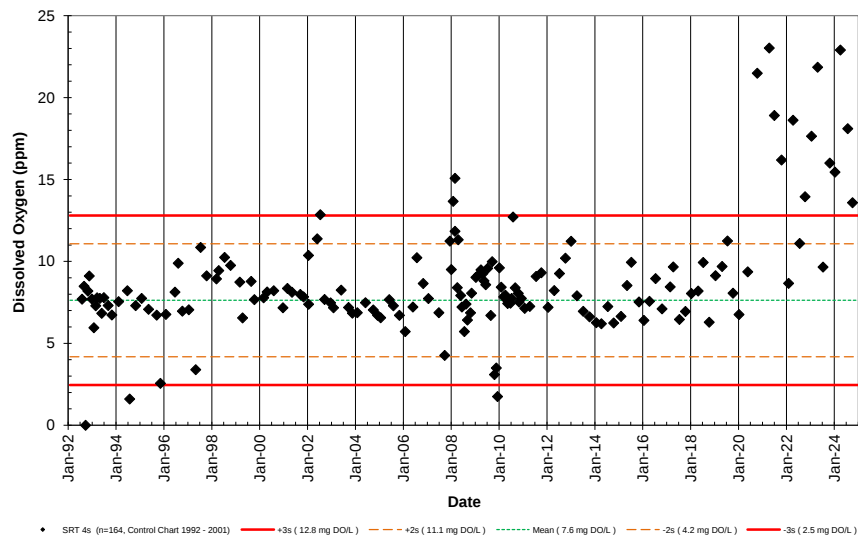


Seawater Return Trench 4
Conservative Mixing Model
Silicate ($\mu\text{g Si/L}$)

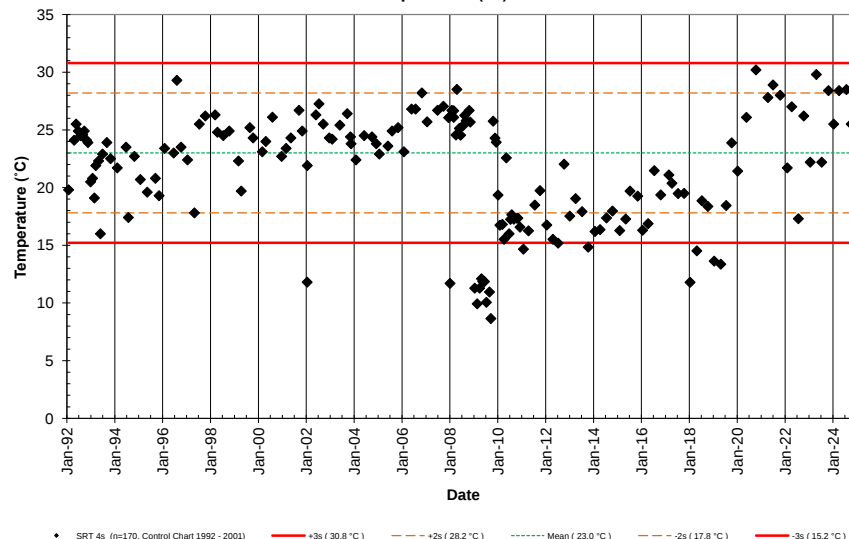




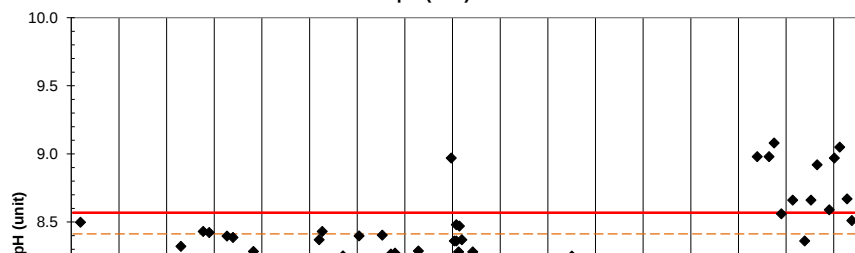
Seawater Return Trench 4
Dissolved Oxygen (ppm)



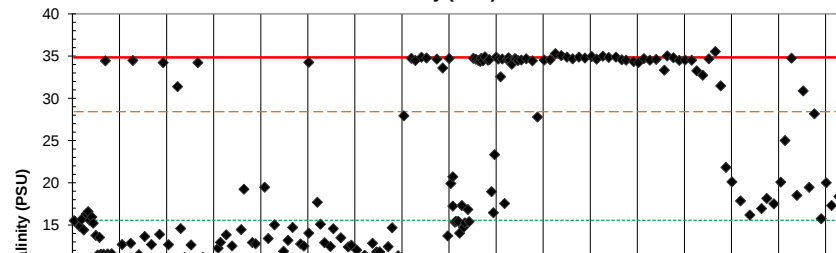
Seawater Return Trench 4
Temperature (°C)



Seawater Return Trench 4
pH (unit)



Seawater Return Trench 4
Salinity (PSU)



NELHA Water Quality Laboratory

Seawater Return Trench 4 Charts
1/28/1992 - 6/30/2025

