

Rookery Bay National Estuarine Research Reserve

SEACAR Water Quality Analysis

Last compiled on 06 March, 2025

Contents

Indicators	2
Nutrients	2
Total Nitrogen - Discrete	2
Total Phosphorus - Discrete	4
Water Quality	6
Dissolved Oxygen - Discrete	6
Dissolved Oxygen - Continuous	8
Dissolved Oxygen Saturation - Discrete	10
Dissolved Oxygen Saturation - Continuous	12
Salinity - Discrete	14
Salinity - Continuous	15
Water Temperature - Discrete	20
Water Temperature - Continuous	21
pH - Discrete	26
pH - Continuous	28
Water Clarity	30
Turbidity - Discrete	30
Turbidity - Continuous	32
Total Suspended Solids - Discrete	34
Chlorophyll a, Uncorrected for Pheophytin - Discrete	36
Chlorophyll a, Corrected for Pheophytin - Discrete	38
Secchi Depth - Discrete	40
Colored Dissolved Organic Matter - Discrete	42

Indicators

Nutrients

Total Nitrogen - Discrete

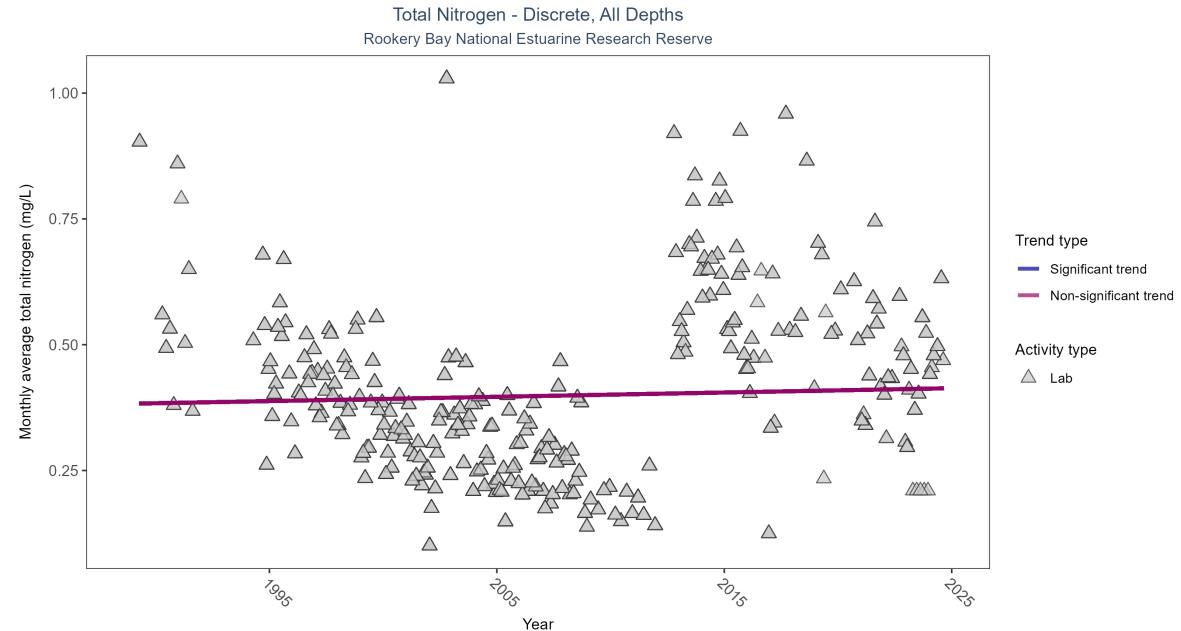
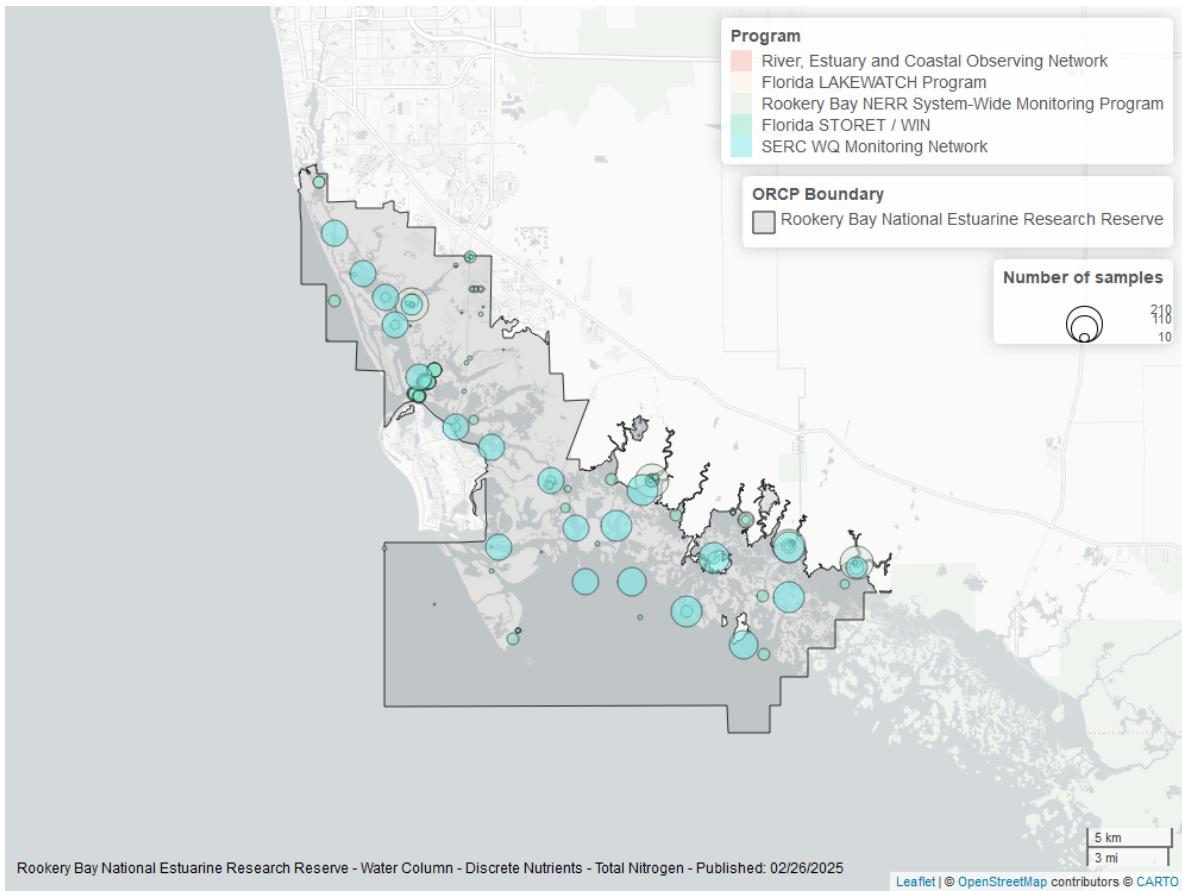


Table 1: Seasonal Kendall-Tau Results for - Total Nitrogen

Activity Type	Statistical Trend	Sample Count	Years with Data	Period of Record	Median Result Value	Tau	Sen Intercept	Sen Slope	P
Lab	No significant trend	5314	34	1989 - 2024	0.318	0.0242	0.38279	0.00085	0.6187



Total Phosphorus - Discrete

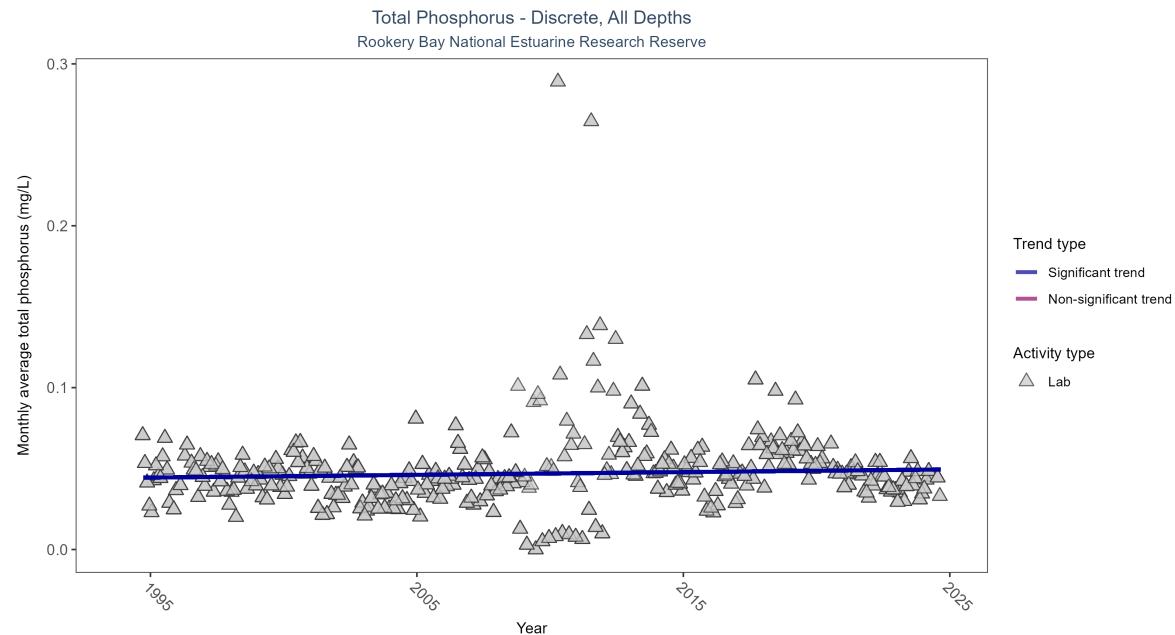
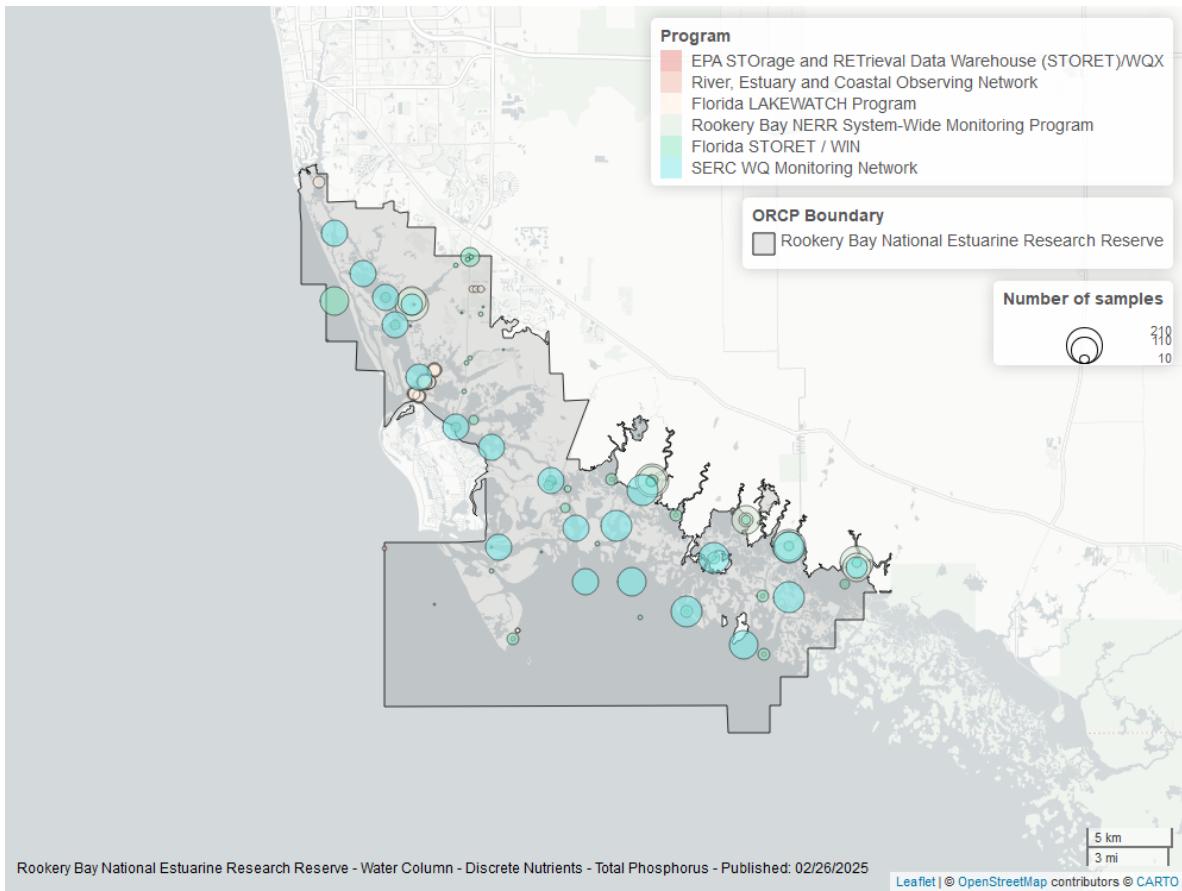


Table 2: Seasonal Kendall-Tau Results for - Total Phosphorus

Activity Type	Statistical Trend	Sample Count	Years with Data	Period of Record	Median Result Value	Tau	Sen Intercept	Sen Slope	P
Lab	Significantly increasing trend	5539	31	1994 - 2024	0.04	0.0757	0.04427	0.00017	0.0458



Water Quality

Dissolved Oxygen - Discrete

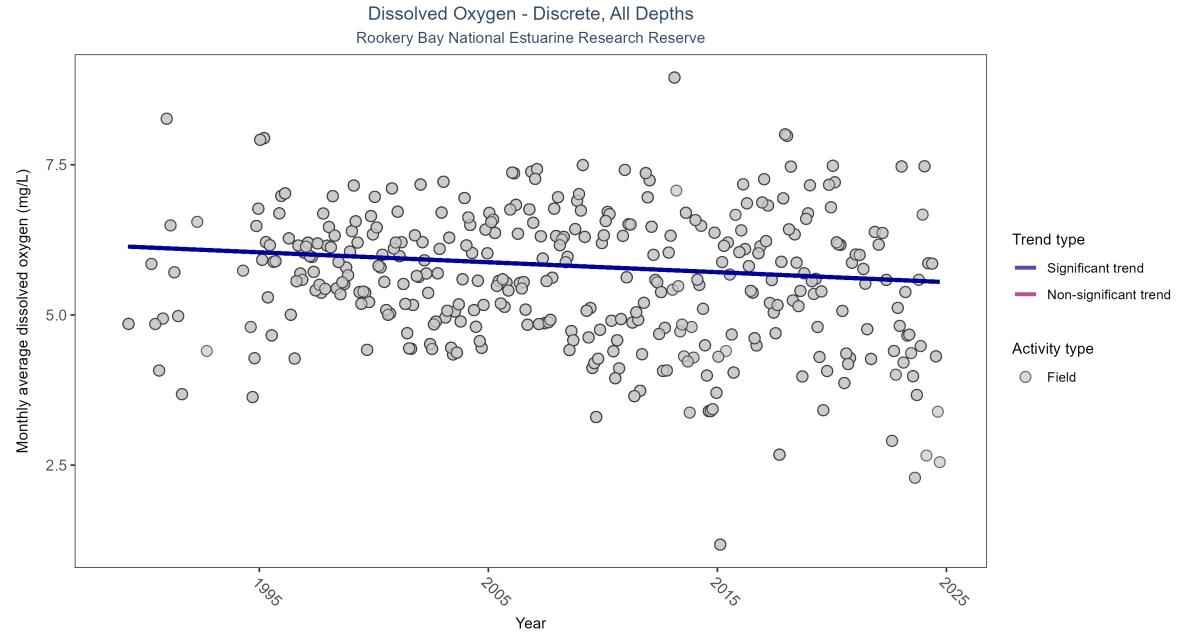
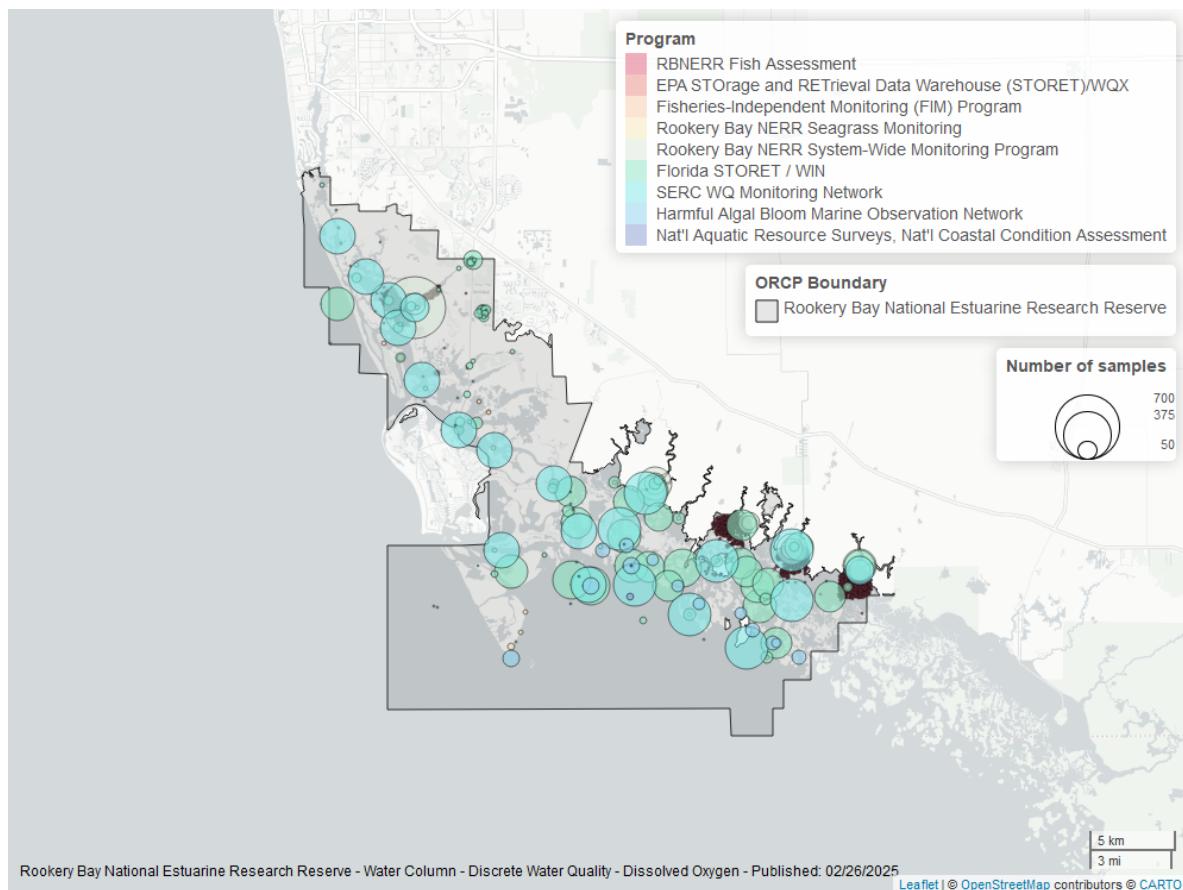


Table 3: Seasonal Kendall-Tau Results for - Dissolved Oxygen

Activity Type	Statistical Trend	Sample Count	Years with Data	Period of Record	Median Result Value	Tau	Sen Intercept	Sen Slope	P
Field	Significantly decreasing trend	15338	35	1989 - 2024	5.8	-0.1264	6.14199	-0.01655	0.0006



Dissolved Oxygen - Continuous

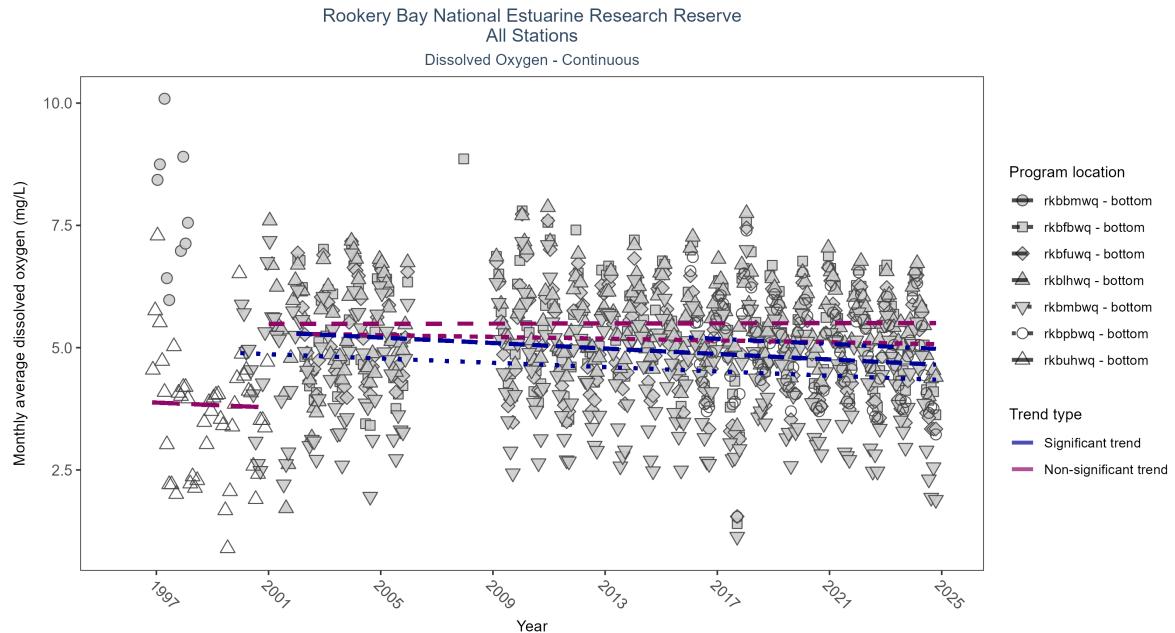
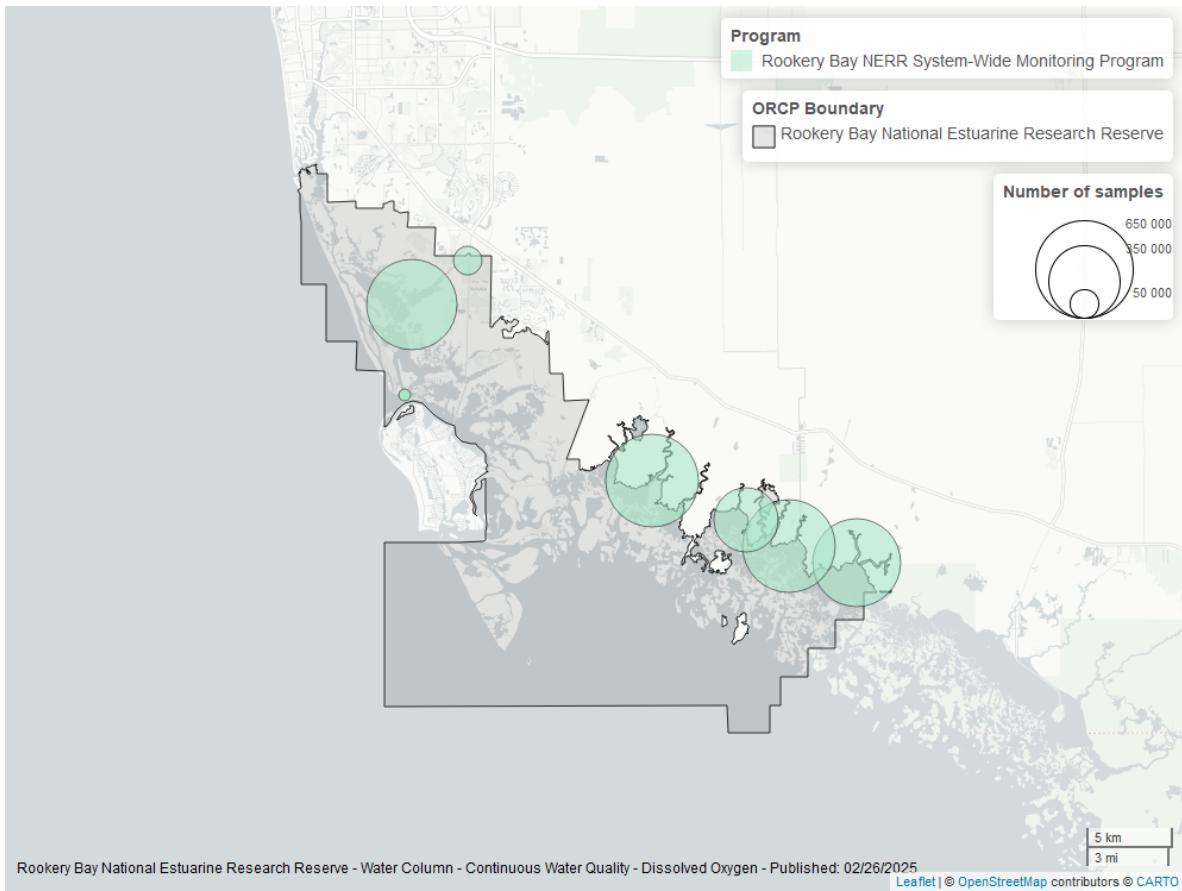


Table 4: Seasonal Kendall-Tau Results for All Stations - Dissolved Oxygen

Program Location	Statistical Trend	Sample Count	Years with Data	Period of Record	Median Result Value	Tau	Sen Intercept	Sen Slope	P
rkbbmwq	Insufficient data to calculate trend	10441	2	1997 - 1998	7.2	-	-	-	NA
rkbfbwq	No significant trend	559530	21	2002 - 2024	5.4	-0.08	5.28	-0.01	0.1032
rkbfuwq	Significantly decreasing trend	594676	20	2002 - 2024	5.0	-0.33	5.29	-0.03	0.0000
rkblhwq	No significant trend	570691	21	2001 - 2024	5.5	0	5.48	0	0.8577
rkmbbwq	Significantly decreasing trend	613238	22	2000 - 2024	4.4	-0.26	4.89	-0.02	0.0000
rkbuhwq	No significant trend	58164	5	1996 - 2000	3.6	0.01	3.9	-0.02	1.0000
rkbpbwq	Significantly decreasing trend	289726	9	2016 - 2024	4.9	-0.18	5.21	-0.03	0.0246



Dissolved Oxygen Saturation - Discrete

Dissolved Oxygen Saturation - Discrete, All Depths
Rookery Bay National Estuarine Research Reserve

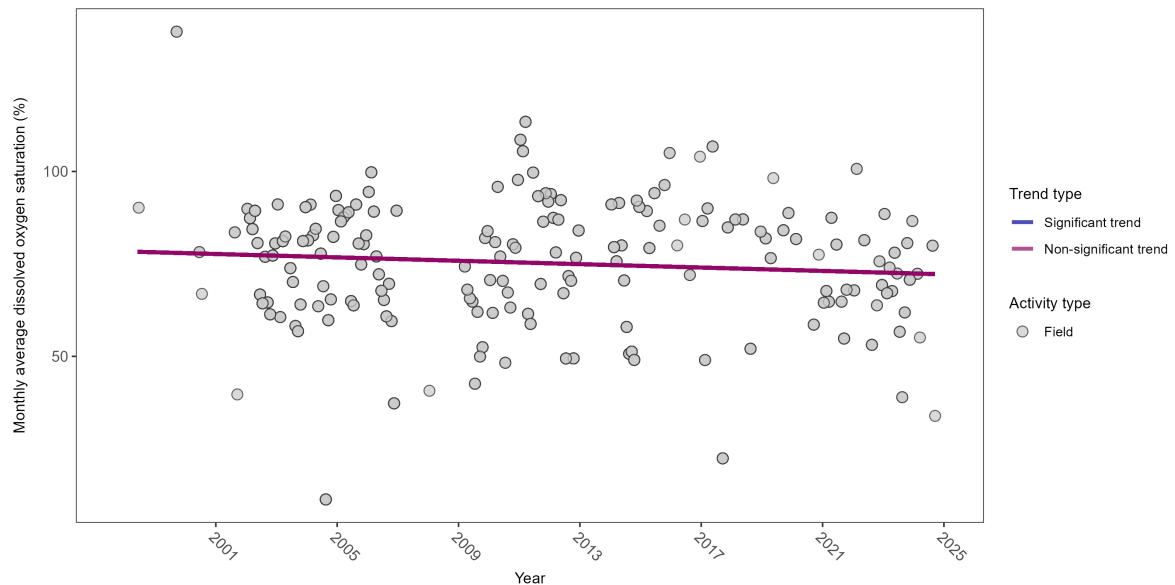
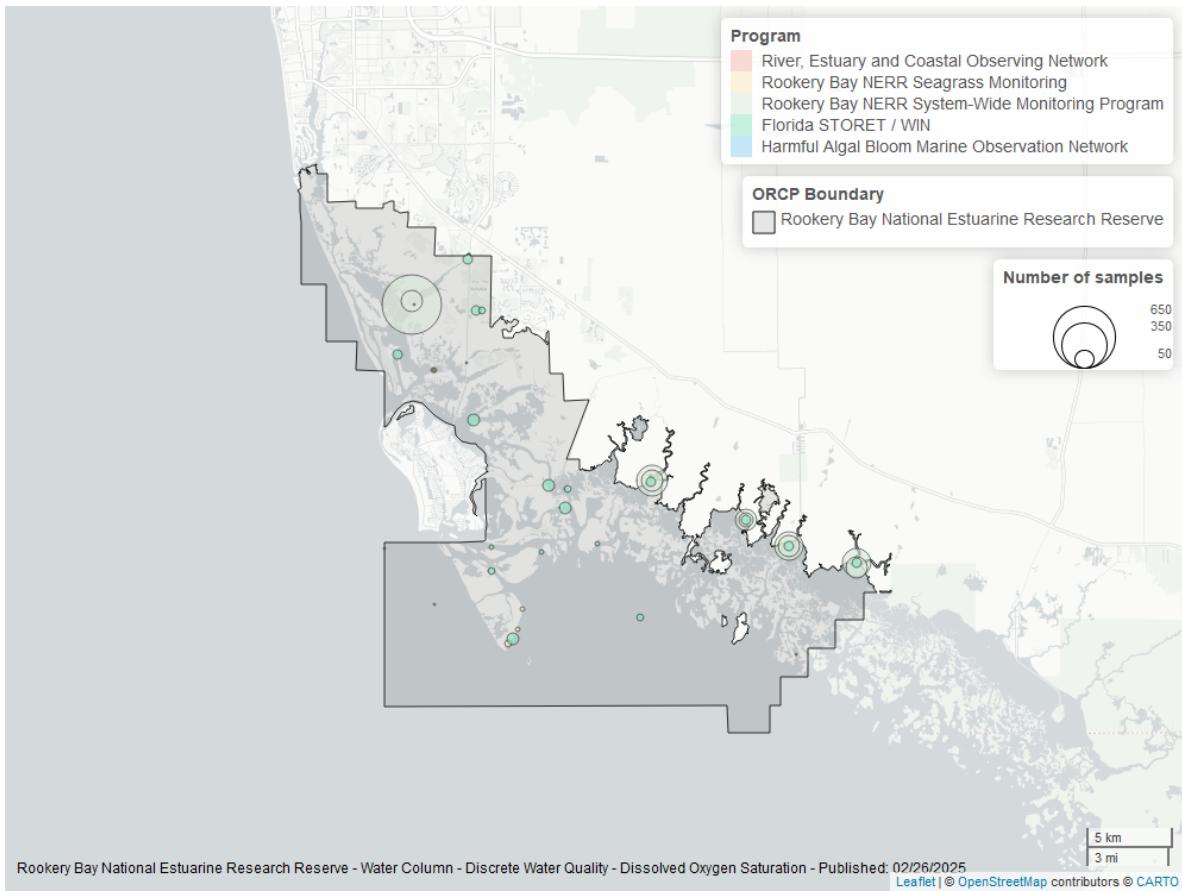


Table 5: Seasonal Kendall-Tau Results for - Dissolved Oxygen Saturation

Activity Type	Statistical Trend	Sample Count	Years with Data	Period of Record	Median Result Value	Tau	Sen Intercept	Sen Slope	P
Field	No significant trend	1399	25	1998 - 2024	78	-0.0857	78.37039	-0.22893	0.1330



Dissolved Oxygen Saturation - Continuous

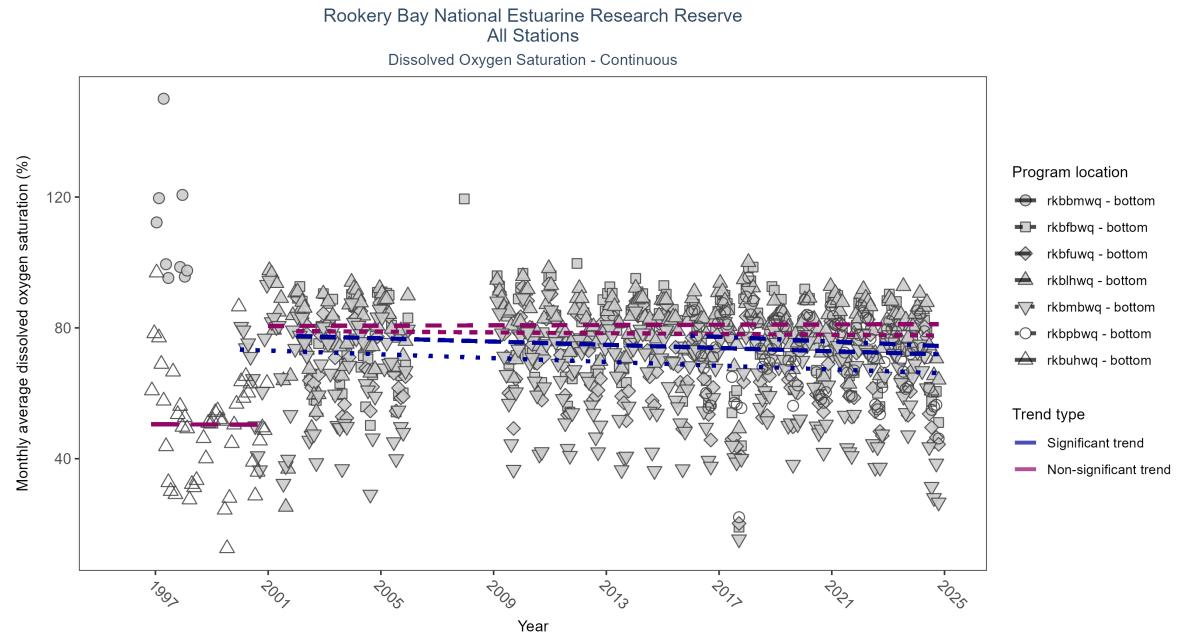
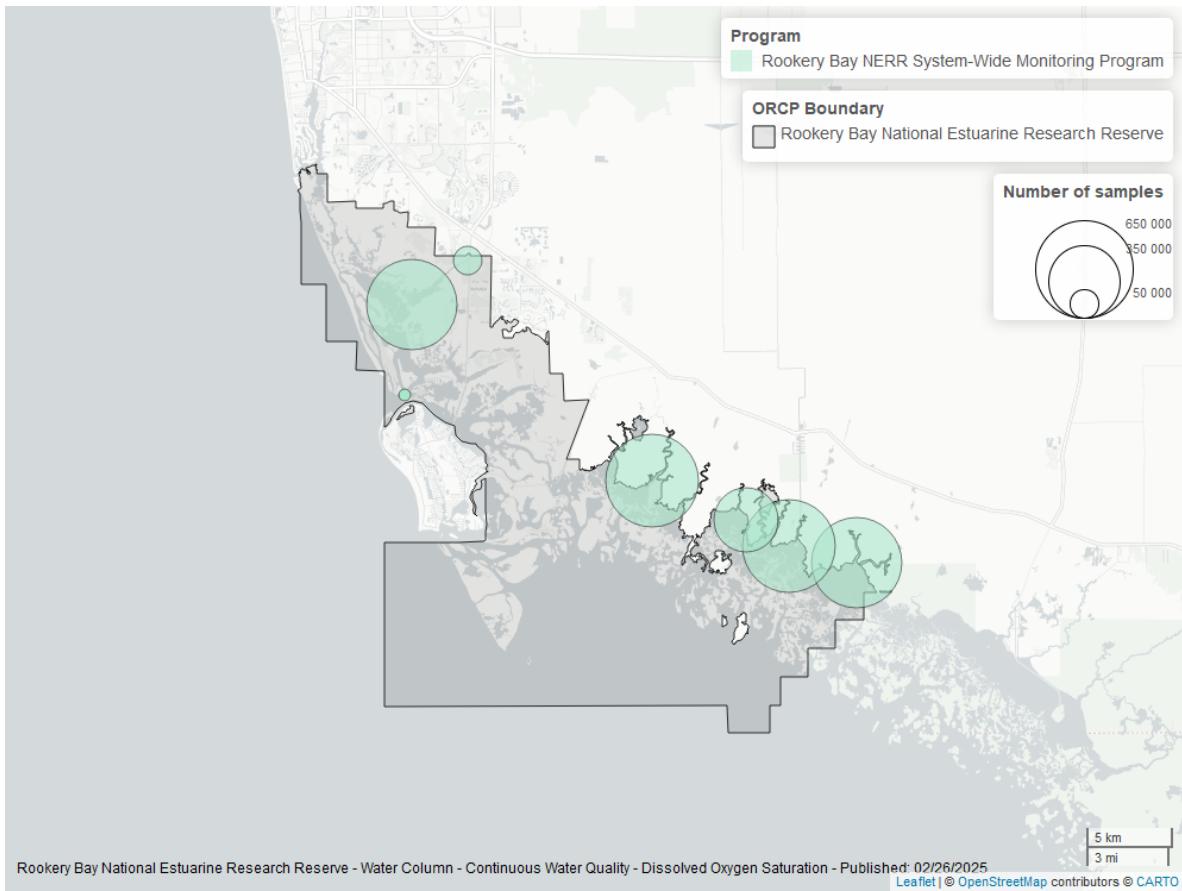


Table 6: Seasonal Kendall-Tau Results for All Stations - Dissolved Oxygen Saturation

Program Location	Statistical Trend	Sample Count	Years with Data	Period of Record	Median Result Value	Tau	Sen Intercept	Sen Slope	P
rkbbmwq	Insufficient data to calculate trend	10441	2	1997 - 1998	102.4	-	-	-	NA
rkbfbwq	No significant trend	563836	21	2002 - 2024	78.3	-0.04	79.01	-0.06	0.4097
rkbfuwq	Significantly decreasing trend	594935	20	2002 - 2024	72.2	-0.26	77.53	-0.25	0.0000
rkblhwq	No significant trend	583009	21	2001 - 2024	81.7	0.02	80.58	0.02	0.5540
rkmbmwq	Significantly decreasing trend	619562	22	2000 - 2024	65.1	-0.23	73.35	-0.29	0.0000
rkbpbwq	Significantly decreasing trend	291357	9	2016 - 2024	72.3	-0.18	77.6	-0.36	0.0289
rkbuhwq	No significant trend	58164	5	1996 - 2000	49.7	0	50.53	-0.02	1.0000



Salinity - Discrete

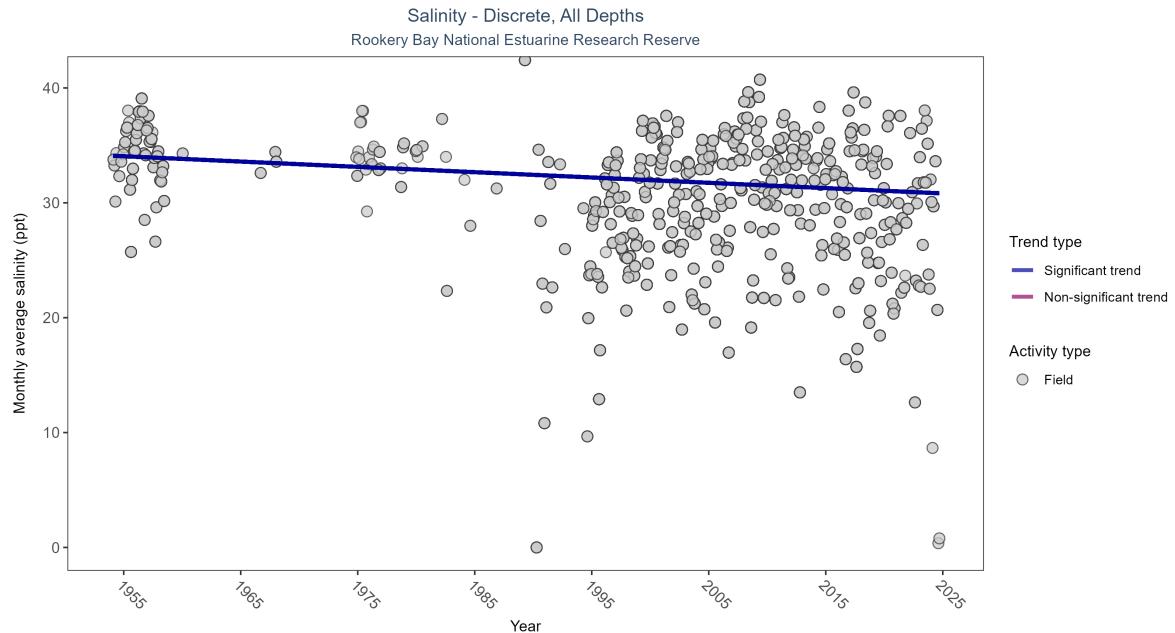
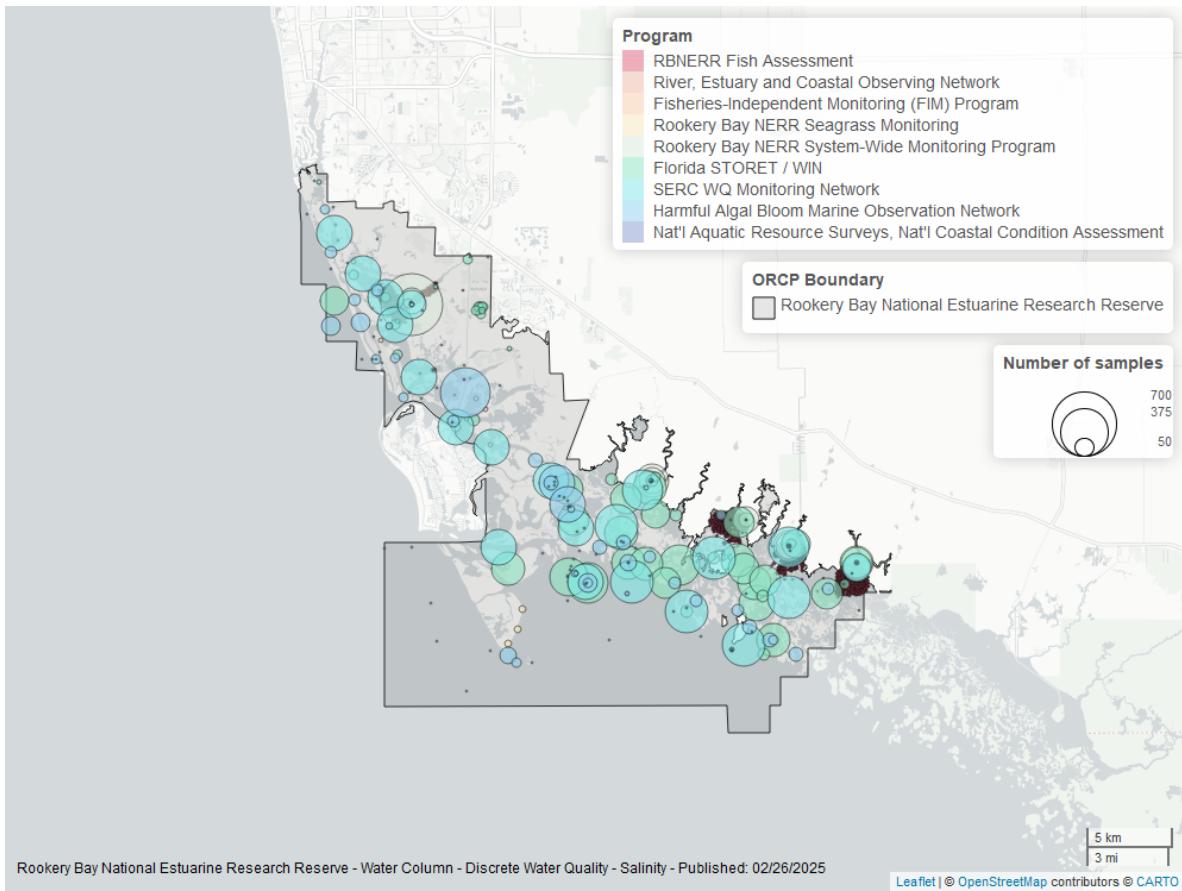


Table 7: Seasonal Kendall-Tau Results for - Salinity

Activity Type	Statistical Trend	Sample Count	Years with Data	Period of Record	Median Result Value	Tau	Sen Intercept	Sen Slope	P
All	Significantly decreasing trend	16801	53	1954 - 2024	32.7	-0.1597	34.10058	-0.04624	0.0000



Salinity - Continuous

National Water Information System - 7

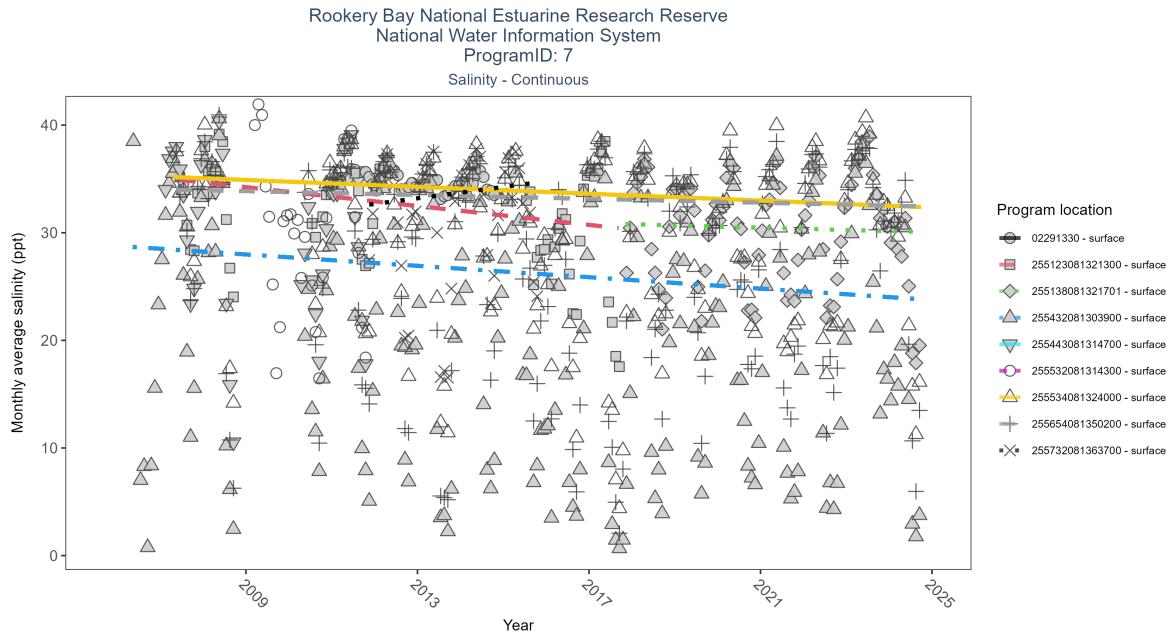
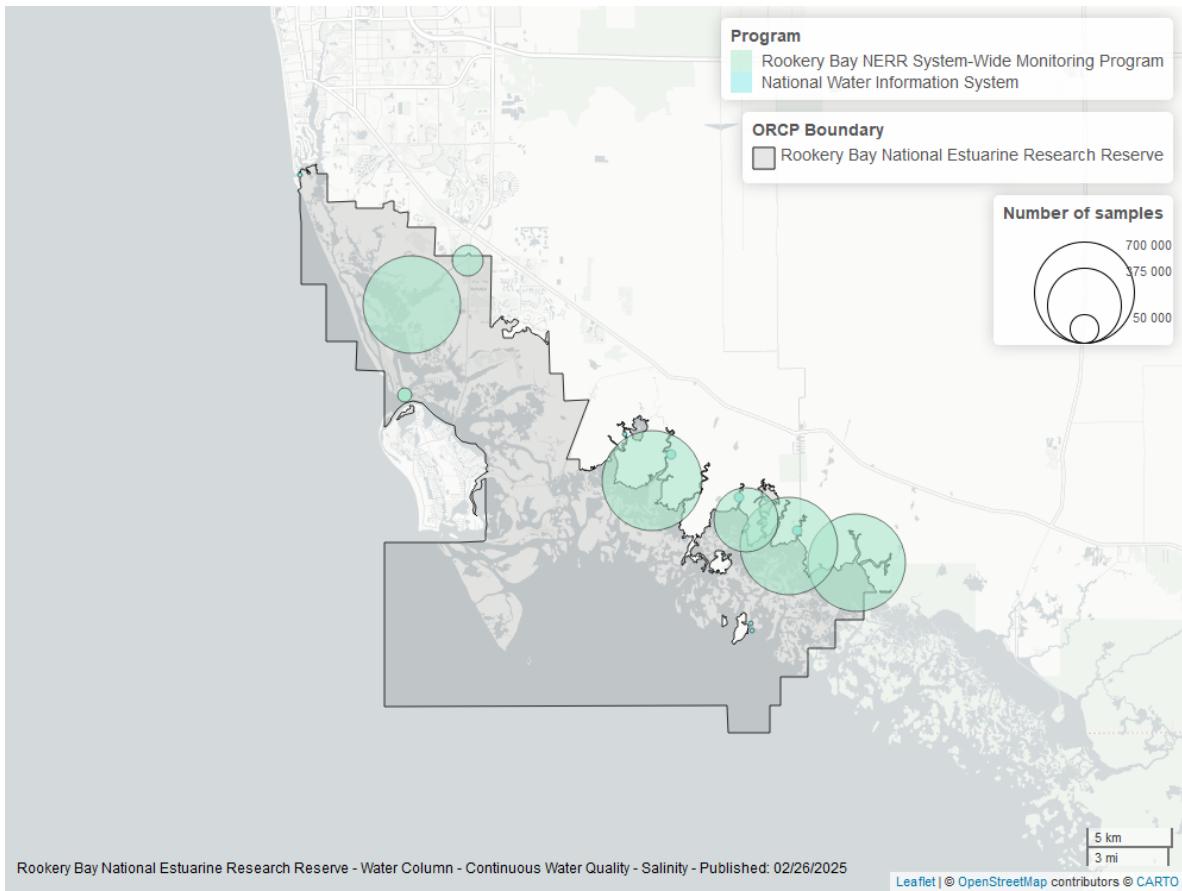


Table 8: Seasonal Kendall-Tau Results for All Stations - Salinity

Program Location	Statistical Trend	Sample Count	Years with Data	Period of Record	Median Result Value	Tau	Sen Intercept	Sen Slope	P
255654081350200	No significant trend	5674	17	2007 - 2024	32	-0.09	34.04	-0.09	0.0955
255732081363700	No significant trend	1434	5	2011 - 2015	34	0.25	32.15	0.52	0.0955
255443081314700	Insufficient data to calculate trend	1465	4	2007 - 2011	32	-	-	-	NA
255534081324000	Significantly decreasing trend	5677	17	2007 - 2024	32	-0.14	35.22	-0.16	0.0083
255432081303900	Significantly decreasing trend	5961	18	2006 - 2024	21	-0.2	28.77	-0.26	0.0001
255532081314300	Insufficient data to calculate trend	902	3	2009 - 2011	31	-	-	-	NA
255123081321300	Significantly decreasing trend	1809	8	2007 - 2017	32	-0.23	35.11	-0.44	0.0182
255138081321701	No significant trend	2482	8	2017 - 2024	31	-0.05	30.89	-0.11	0.5671
02291330	Insufficient data to calculate trend	1697	4	2011 - 2014	35	-	-	-	NA



Rookery Bay National Estuarine Research Reserve System-Wide Monitoring Program - 354

Rookery Bay National Estuarine Research Reserve
 Rookery Bay National Estuarine Research Reserve System-Wide Monitoring Program
 ProgramID: 354
 Salinity - Continuous

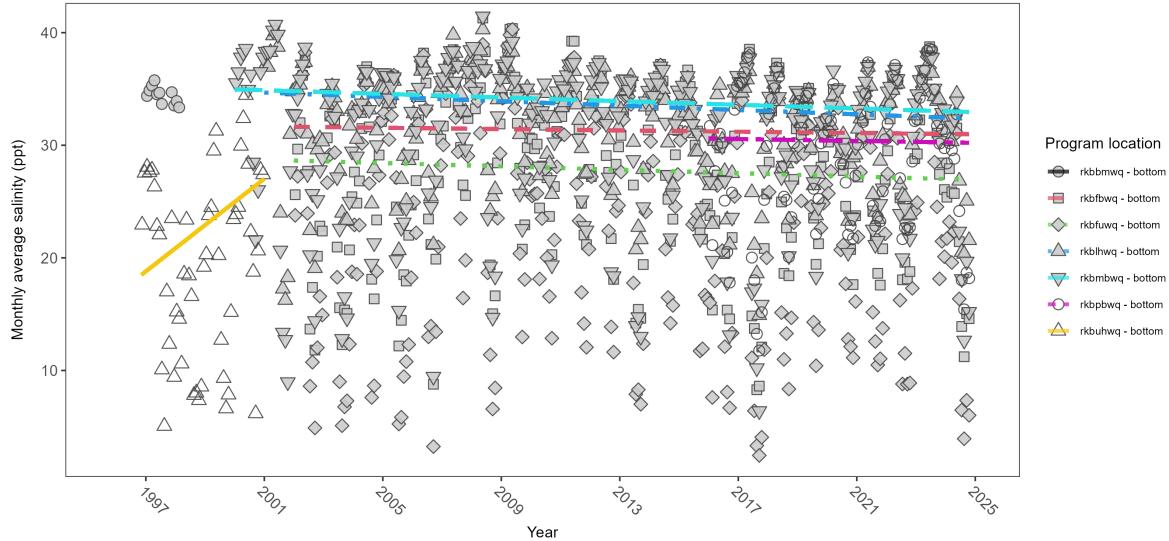
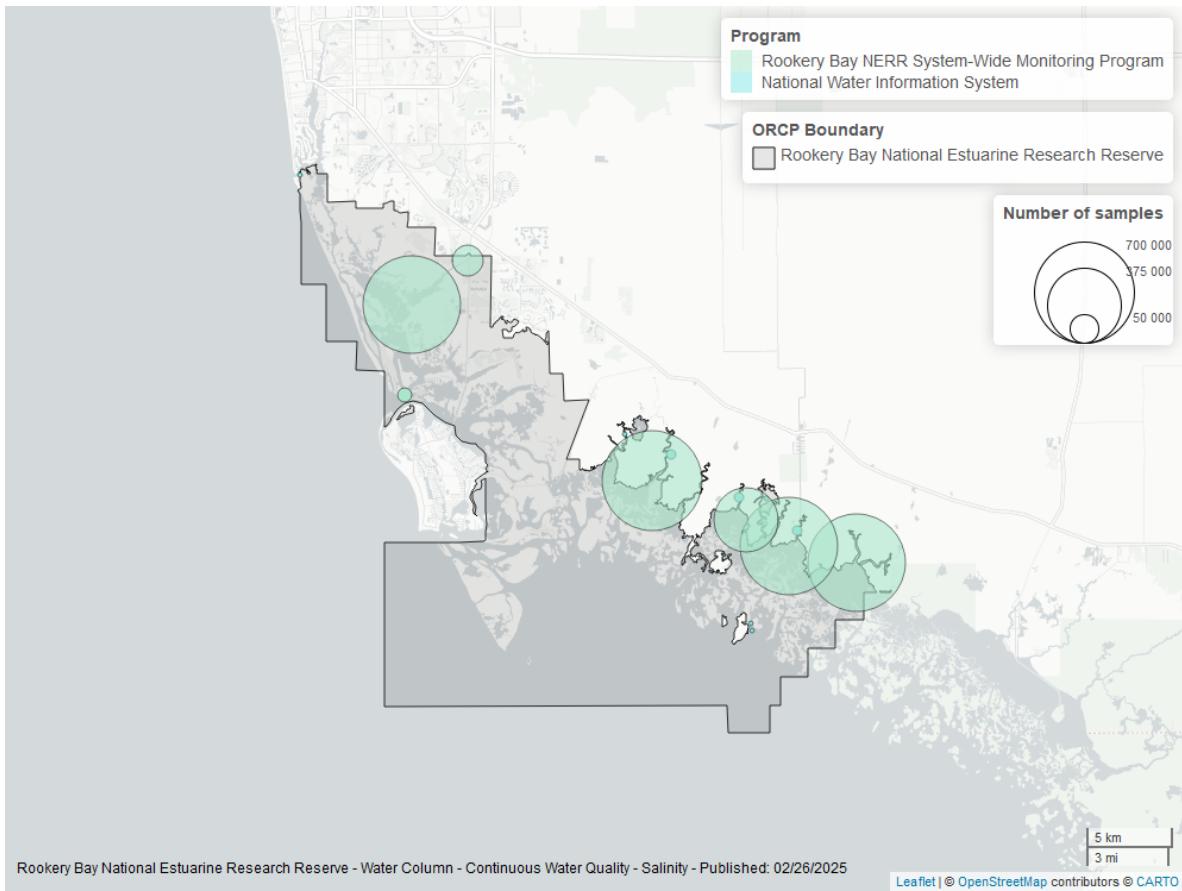


Table 9: Seasonal Kendall-Tau Results for All Stations - Salinity

Program Location	Statistical Trend	Sample Count	Years with Data	Period of Record	Median Result Value	Tau	Sen Intercept	Sen Slope	P
rkbfbwq	No significant trend	658798	23	2002 - 2024	29.6	-0.03	31.64	-0.03	0.4691
rkbmbwq	Insufficient data to calculate trend	12256	2	1997 - 1998	34.5	-	-	-	NA
rkbfuwq	No significant trend	675230	23	2002 - 2024	26.0	-0.07	28.65	-0.07	0.1290
rkbhwq	Significantly decreasing trend	657842	24	2001 - 2024	33.1	-0.16	34.68	-0.1	0.0001
rkbmbwq	Significantly decreasing trend	694825	25	2000 - 2024	33.3	-0.12	34.97	-0.08	0.0032
rkbuhwq	Significantly increasing trend	68446	5	1996 - 2000	21.1	0.31	16.74	2.06	0.0358
rkbpbwq	No significant trend	290041	9	2016 - 2024	30.2	-0.01	30.6	-0.04	0.9243



Water Temperature - Discrete

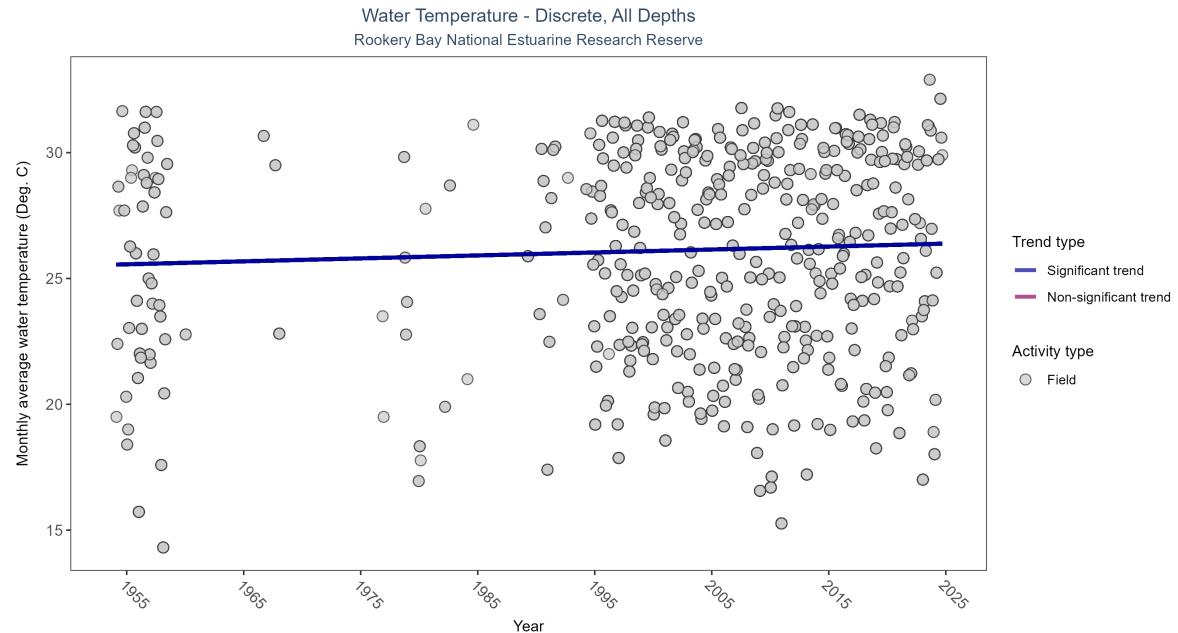
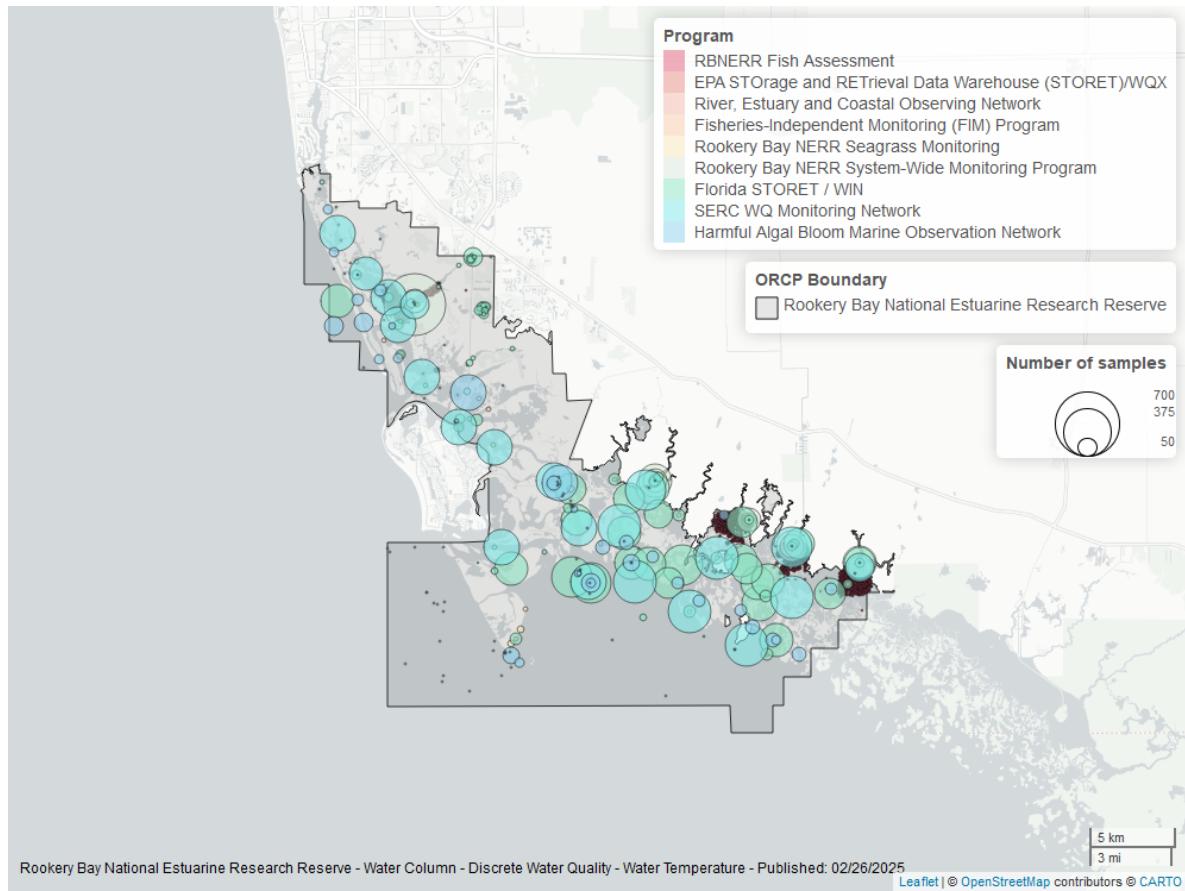


Table 10: Seasonal Kendall-Tau Results for - Water Temperature

Activity Type	Statistical Trend	Sample Count	Years with Data	Period of Record	Median Result Value	Tau	Sen Intercept	Sen Slope	P
Field	Significantly increasing trend	16837	50	1954 - 2024	26.64	0.1001	25.55123	0.01176	0.0029



Water Temperature - Continuous

National Water Information System - 7

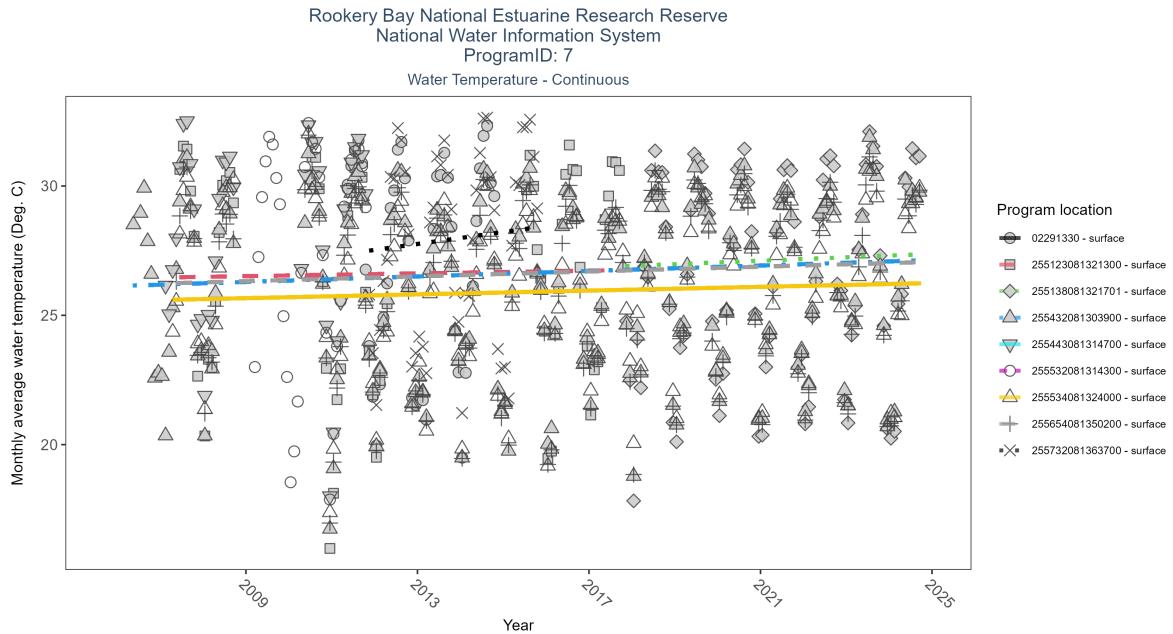
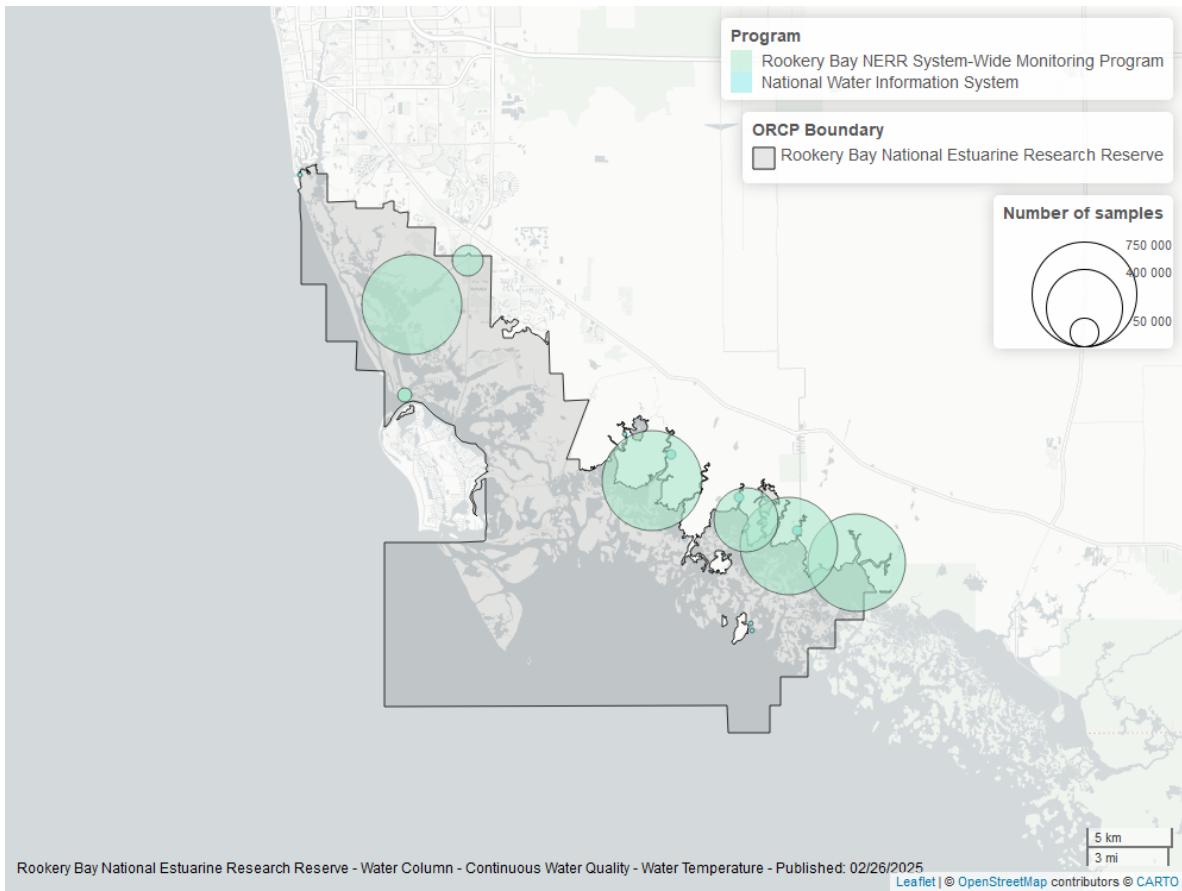


Table 11: Seasonal Kendall-Tau Results for All Stations - Water Temperature

Program Location	Statistical Trend	Sample Count	Years with Data	Period of Record	Median Result Value	Tau	Sen Intercept	Sen Slope	P
255654081350200	Significantly increasing trend	5712	17	2007 - 2024	26.9	0.15	26.23	0.05	0.0054
255443081314700	Insufficient data to calculate trend	2011	4	2007 - 2011	29.3	-	-	-	NA
255532081314300	Insufficient data to calculate trend	906	3	2009 - 2011	29.3	-	-	-	NA
255534081324000	Significantly increasing trend	5733	17	2007 - 2024	26.7	0.14	25.59	0.04	0.0088
255432081303900	Significantly increasing trend	6019	18	2006 - 2024	27.1	0.17	26.13	0.05	0.0011
255732081363700	No significant trend	1435	5	2011 - 2015	28.4	0.24	27.3	0.23	0.1149
255138081321701	No significant trend	2498	8	2017 - 2024	27.3	0.12	26.85	0.07	0.1723
255123081321300	No significant trend	1818	8	2007 - 2017	27.3	0.1	26.46	0.03	0.3843
02291330	Insufficient data to calculate trend	1901	4	2011 - 2014	28.3	-	-	-	NA



Rookery Bay National Estuarine Research Reserve System-Wide Monitoring Program - 354

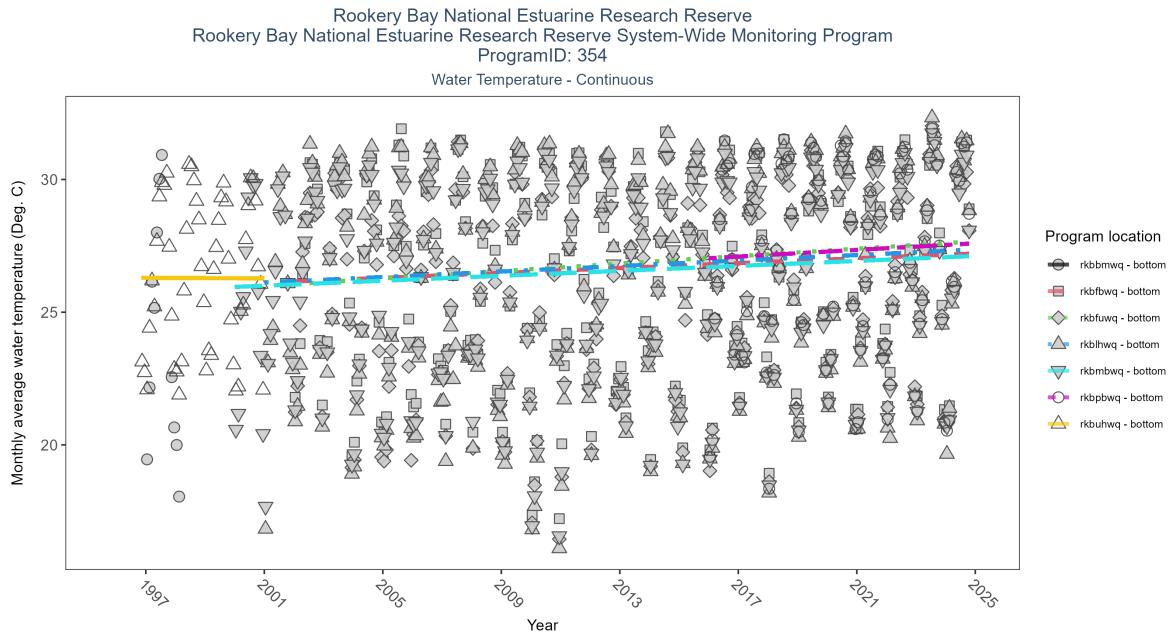
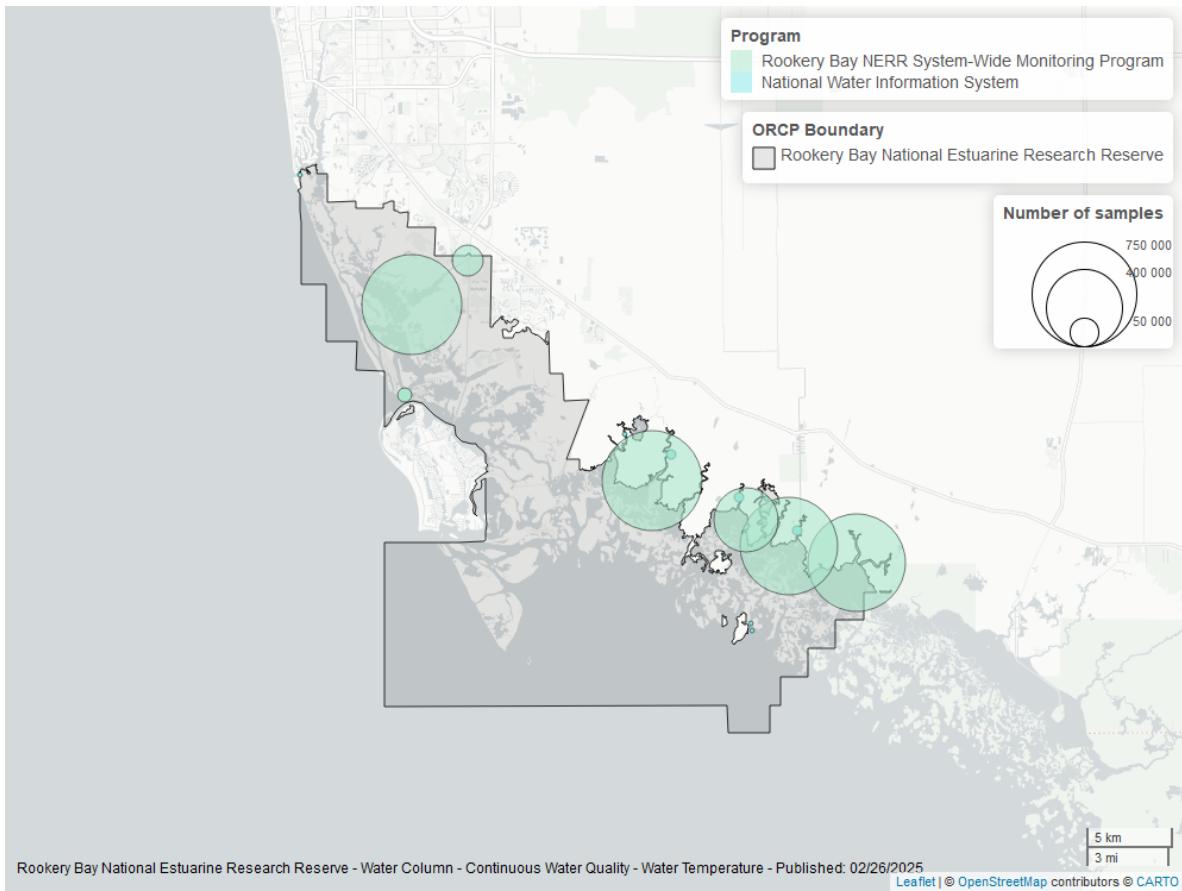


Table 12: Seasonal Kendall-Tau Results for All Stations - Water Temperature

Program Location	Statistical Trend	Sample Count	Years with Data	Period of Record	Median Result Value	Tau	Sen Intercept	Sen Slope	P
rkbfbwq	Significantly increasing trend	674632	23	2002 - 2024	27.1	0.24	26.15	0.05	0.0000
rkbmhwq	Insufficient data to calculate trend	12610	2	1997 - 1998	23.8	-	-	-	NA
rkbfuwq	Significantly increasing trend	685661	23	2002 - 2024	27.0	0.27	26.06	0.07	0.0000
rkbhwq	Significantly increasing trend	688994	24	2001 - 2024	27.0	0.25	26.12	0.05	0.0000
rkbmbwq	Significantly increasing trend	718152	25	2000 - 2024	26.9	0.26	25.95	0.05	0.0000
rkbpbwq	No significant trend	292925	9	2016 - 2024	27.6	0.14	27.03	0.06	0.0711
rkbuhwq	No significant trend	68971	5	1996 - 2000	26.8	-0.01	26.3	-0.01	1.0000



pH - Discrete

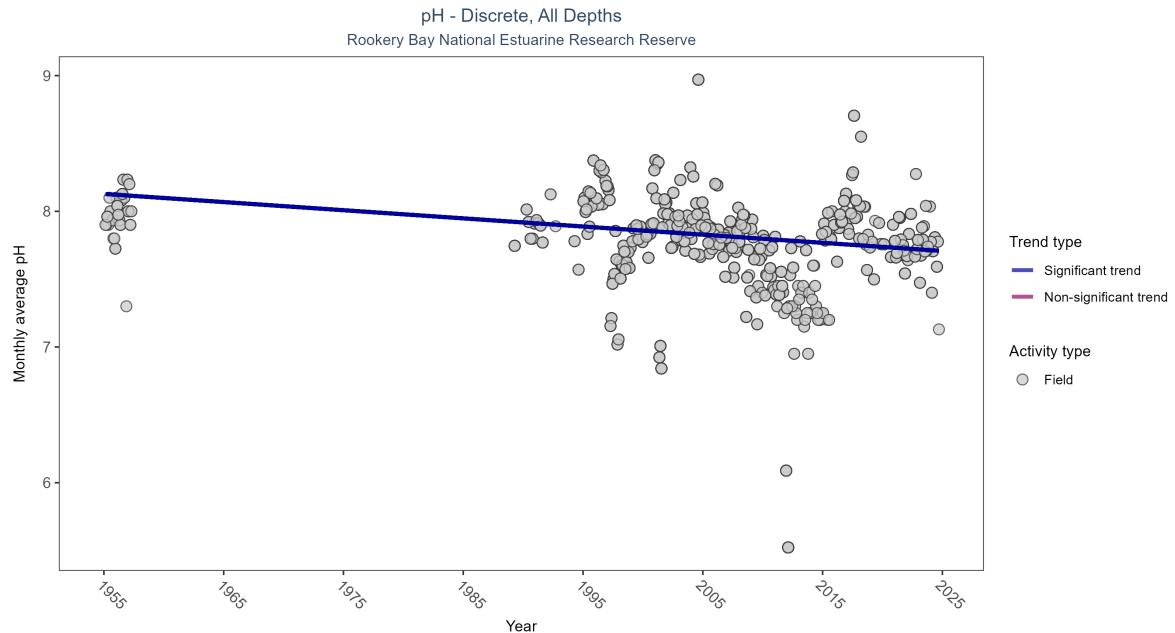
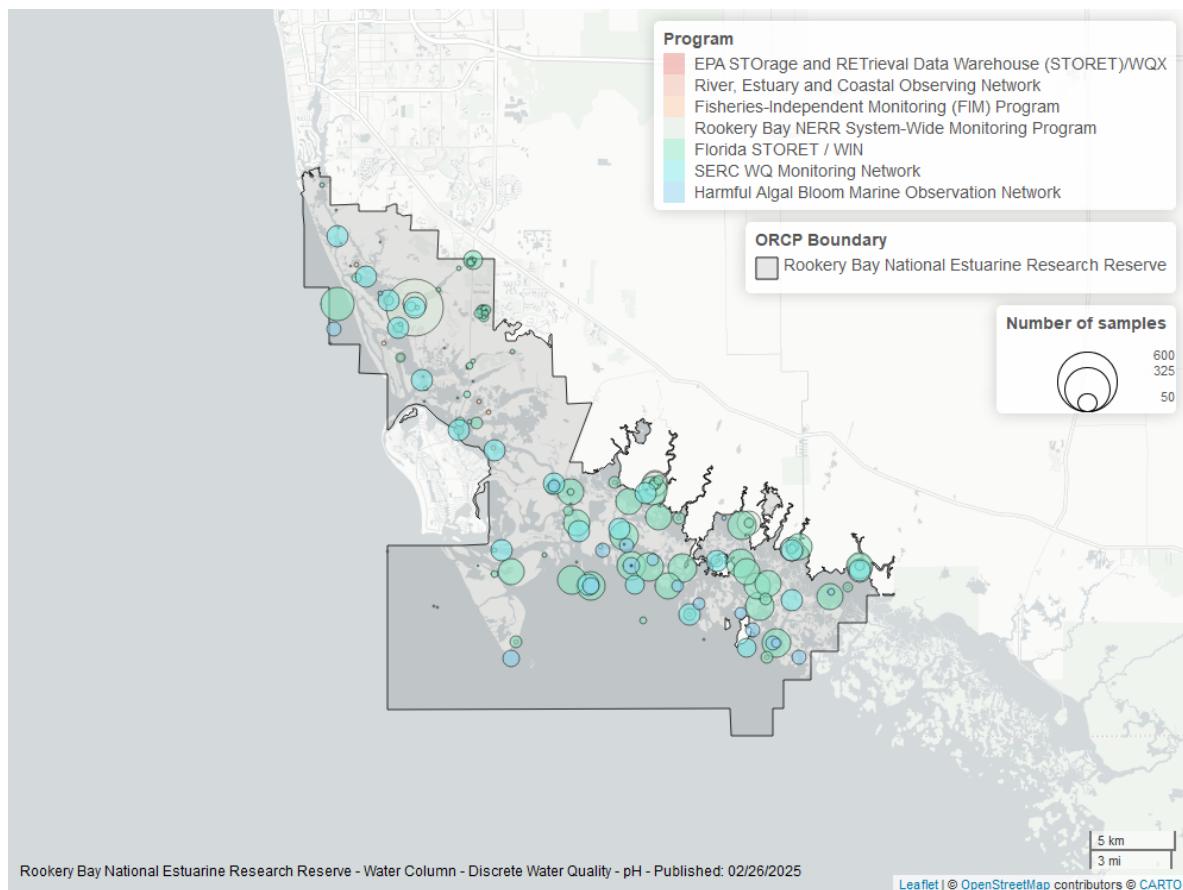


Table 13: Seasonal Kendall-Tau Results for - pH

Activity Type	Statistical Trend	Sample Count	Years with Data	Period of Record	Median Result Value	Tau	Sen Intercept	Sen Slope	P
Field	Significantly decreasing trend	7354	38	1955 - 2024	7.86	-0.2247	8.12825	-0.00601	0.0000



pH - Continuous

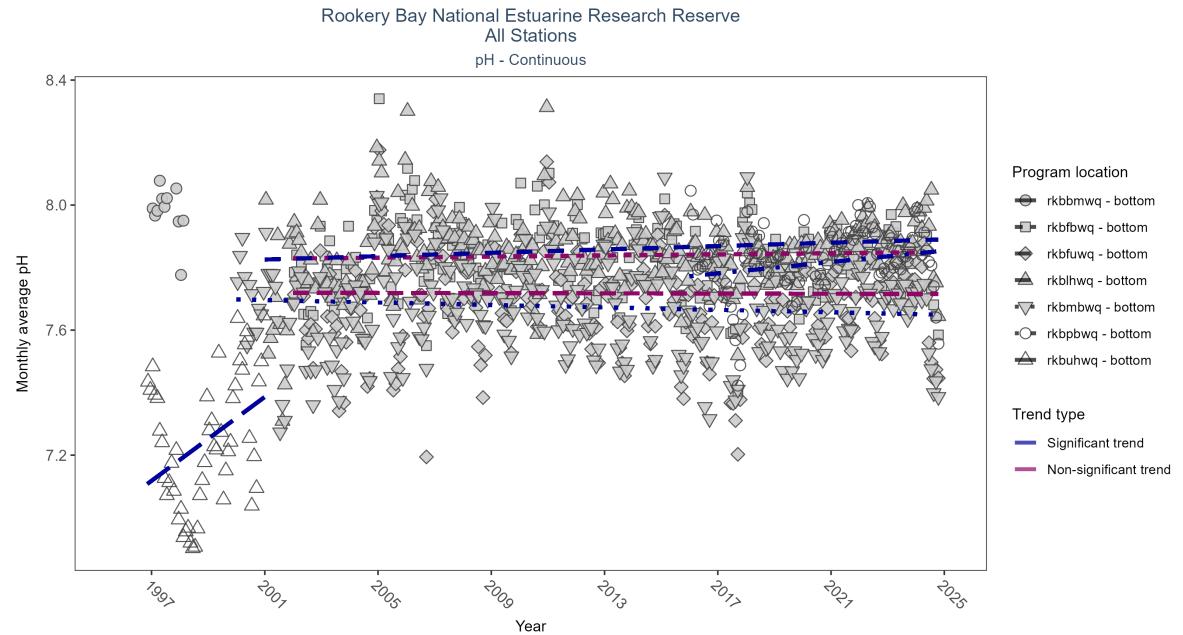
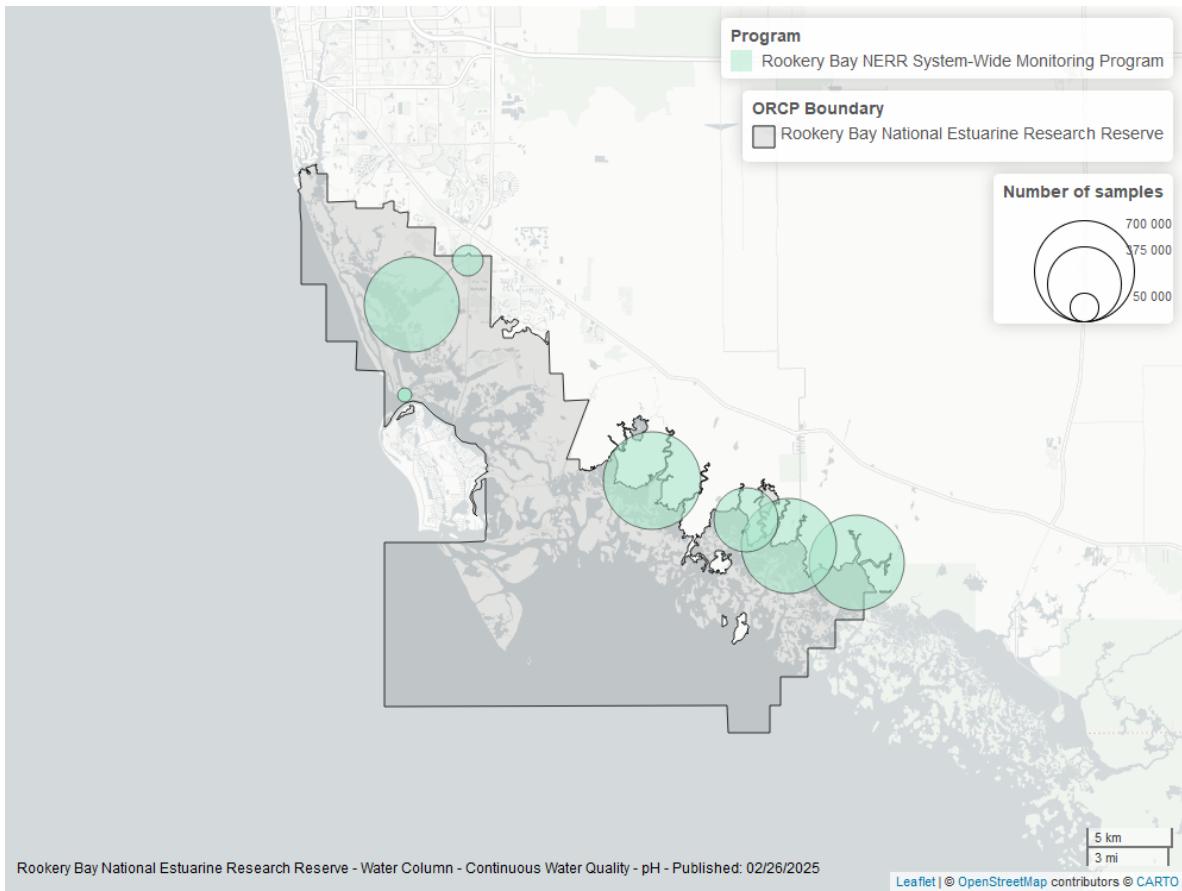


Table 14: Seasonal Kendall-Tau Results for All Stations - pH

Program Location	Statistical Trend	Sample Count	Years with Data	Period of Record	Median Result Value	Tau	Sen Intercept	Sen Slope	P
rkbfbwq	No significant trend	626300	23	2002 - 2024	7.8	0.04	7.83	0	0.3005
rkbmhwq	Insufficient data to calculate trend	12610	2	1997 - 1998	8.0	-	-	-	NA
rkbfwq	No significant trend	649975	23	2002 - 2024	7.7	-0.01	7.72	0	0.8449
rkbhwq	Significantly increasing trend	629829	24	2001 - 2024	7.9	0.14	7.83	0	0.0010
rkbmbwq	Significantly decreasing trend	683502	25	2000 - 2024	7.7	-0.09	7.7	0	0.0346
rkbpbwq	Significantly increasing trend	283219	9	2016 - 2024	7.8	0.2	7.77	0.01	0.0176
rkbuhwq	Significantly increasing trend	65814	5	1996 - 2000	7.2	0.37	7.05	0.07	0.0081



Water Clarity

Turbidity - Discrete

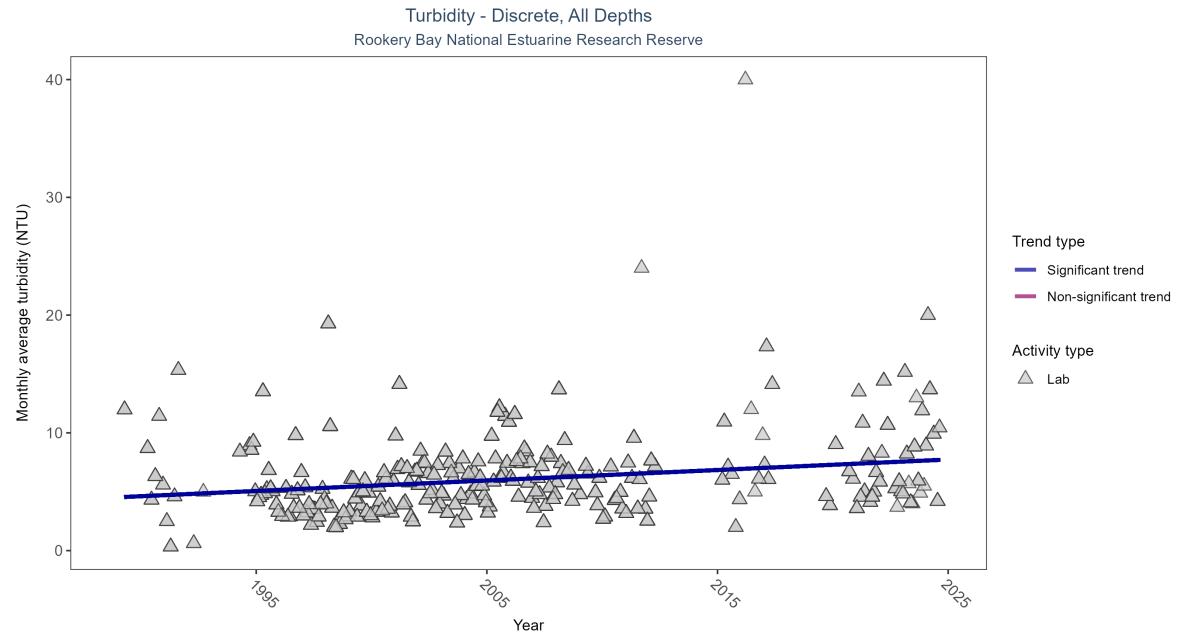
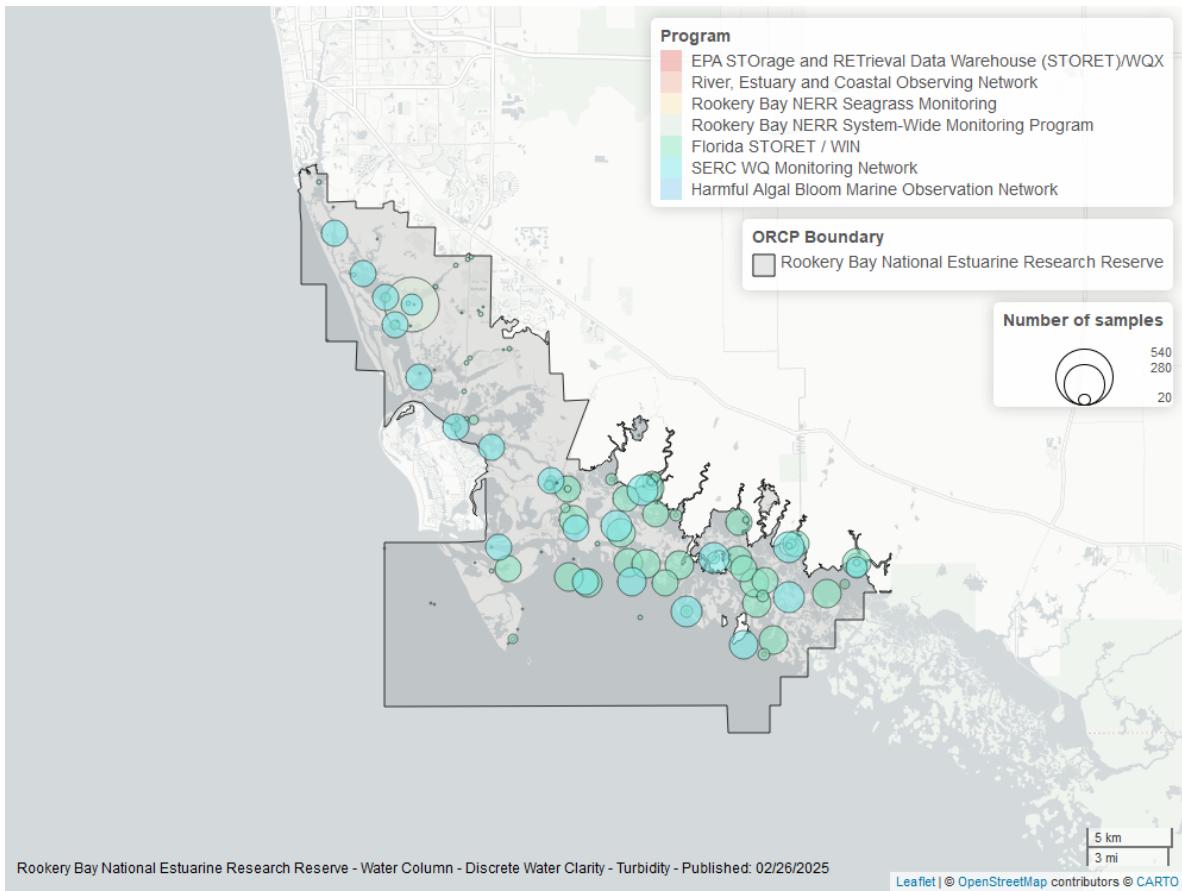


Table 15: Seasonal Kendall-Tau Results for - Turbidity

Activity Type	Statistical Trend	Sample Count	Years with Data	Period of Record	Median Result Value	Tau	Sen Intercept	Sen Slope	P
Lab	Significantly increasing trend	6377	32	1989 - 2024	4.37	0.2069	4.52982	0.08904	0.0000



Turbidity - Continuous

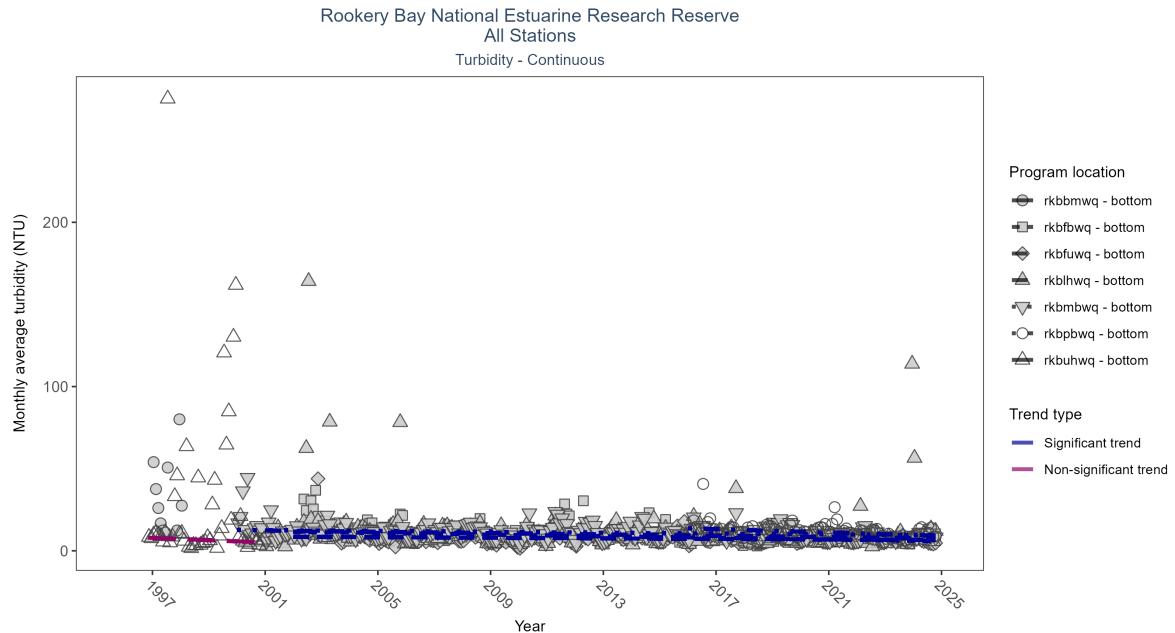
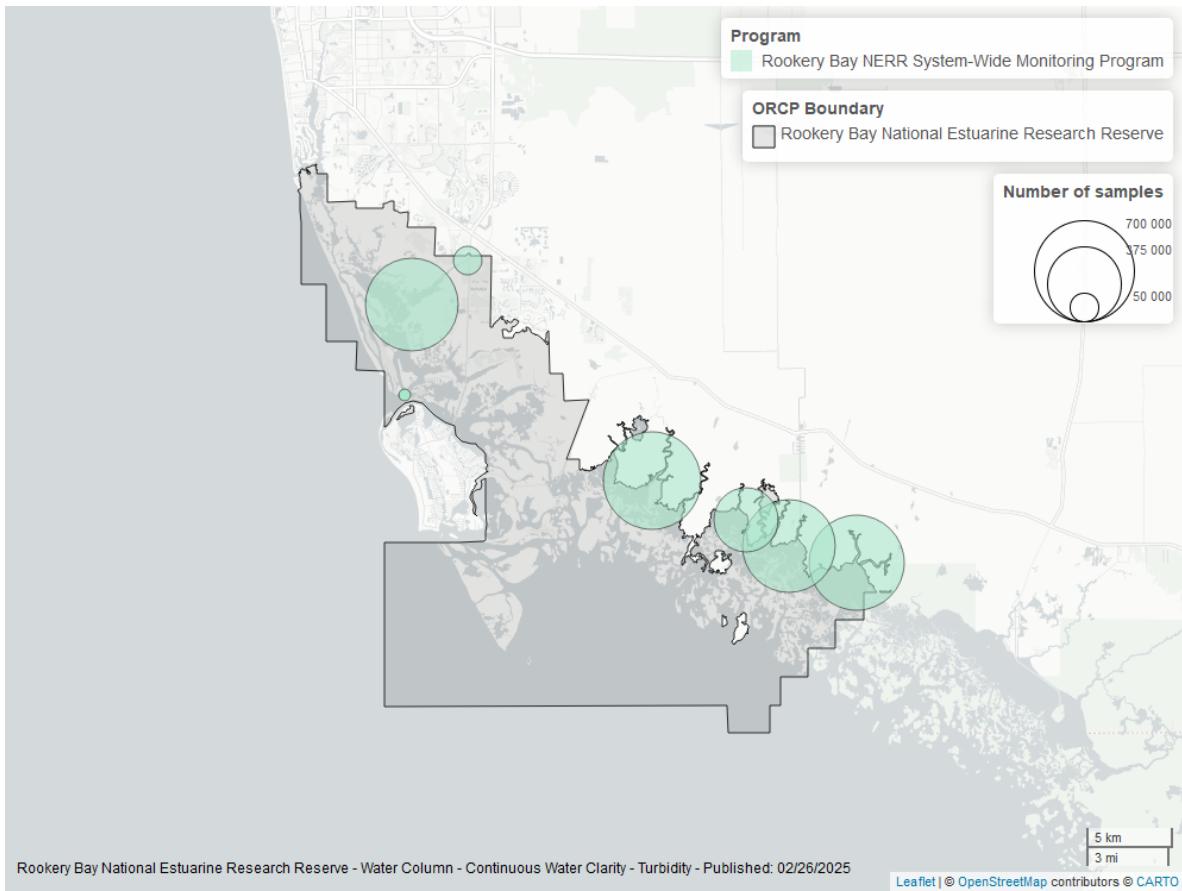


Table 16: Seasonal Kendall-Tau Results for All Stations - Turbidity

Program Location	Statistical Trend	Sample Count	Years with Data	Period of Record	Median Result Value	Tau	Sen Intercept	Sen Slope	P
rkbfbwq	Significantly decreasing trend	638544	23	2002 - 2024	7	-0.39	11.61	-0.25	0.0000
rkbmhwq	Insufficient data to calculate trend	10654	2	1997 - 1998	11	-	-	-	NA
rkbfwq	Significantly decreasing trend	615945	23	2002 - 2024	6	-0.2	8.54	-0.09	0.0000
rkbhwq	Significantly decreasing trend	605017	24	2001 - 2024	8	-0.27	12.4	-0.2	0.0000
rkbmbwq	Significantly decreasing trend	670439	25	2000 - 2024	9	-0.22	12.74	-0.13	0.0000
rkbpbwq	Significantly decreasing trend	286433	9	2016 - 2024	10	-0.37	13.71	-0.51	0.0000
rkbuhwq	No significant trend	61608	5	1996 - 2000	5	-0.11	8.57	-0.7	0.5228



Total Suspended Solids - Discrete

Total Suspended Solids - Discrete, All Depths
Rookery Bay National Estuarine Research Reserve

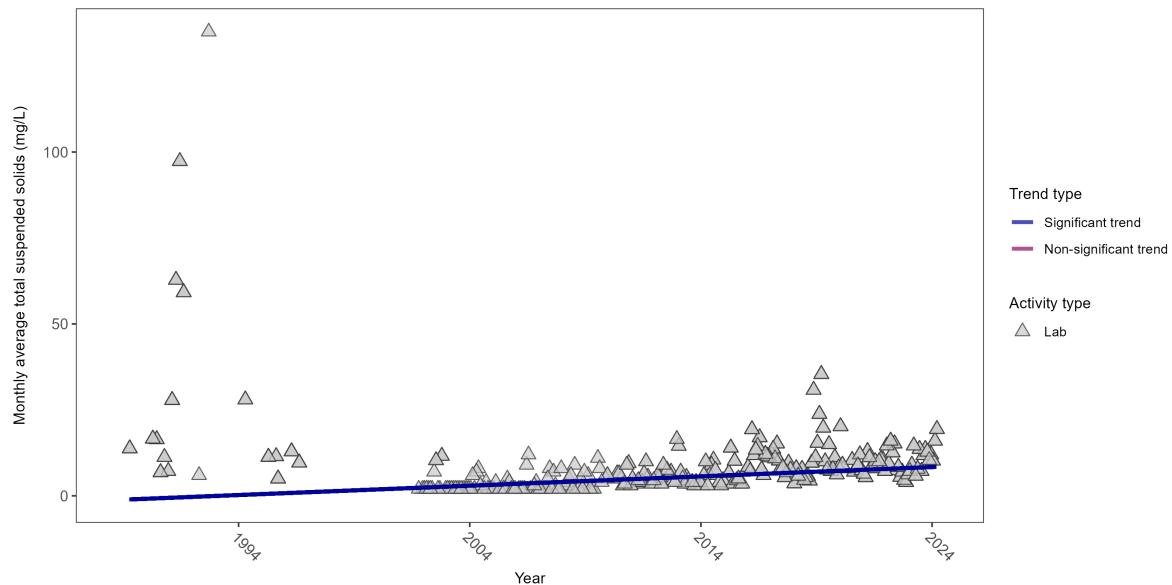
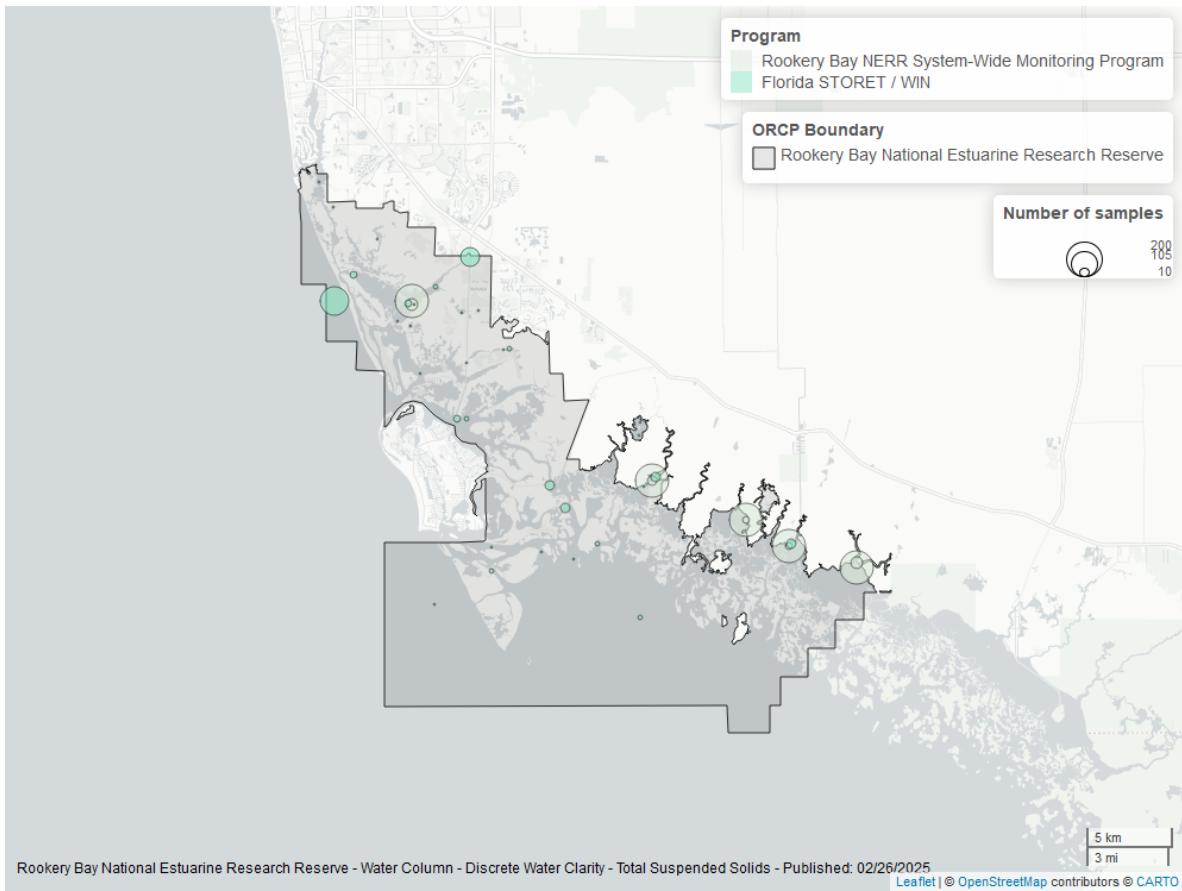


Table 17: Seasonal Kendall-Tau Results for - Total Suspended Solids

Activity Type	Statistical Trend	Sample Count	Years with Data	Period of Record	Median Result Value	Tau	Sen Intercept	Sen Slope	P
Lab	Significantly increasing trend	836	31	1989 - 2024	7	0.3656	-1.125	0.27143	0.0000



Chlorophyll a, Uncorrected for Pheophytin - Discrete

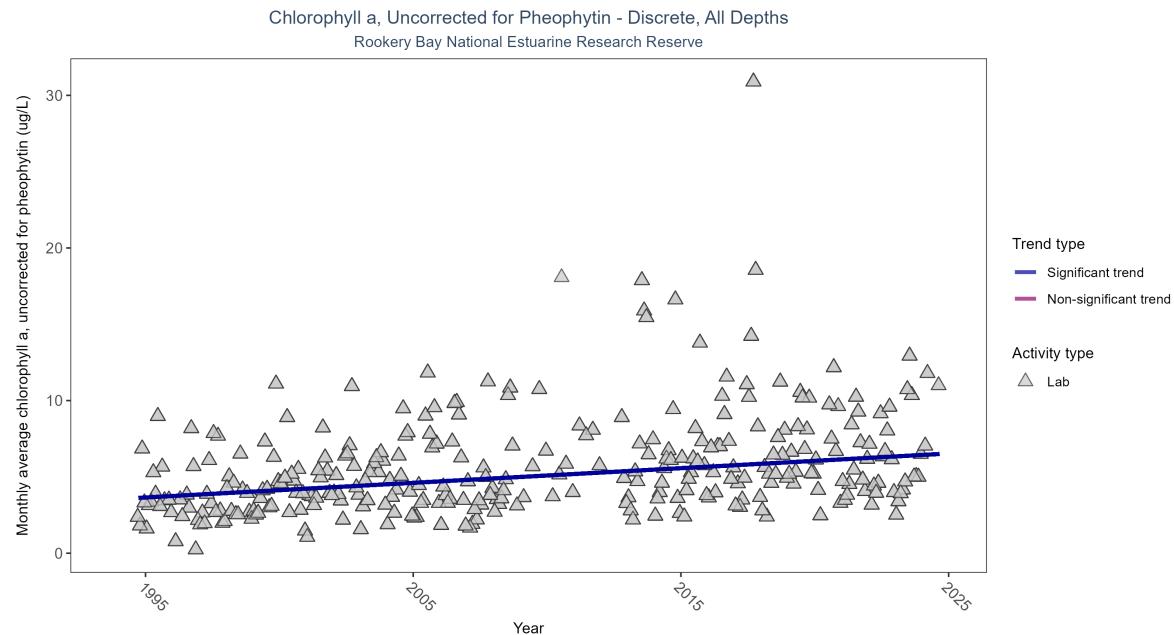
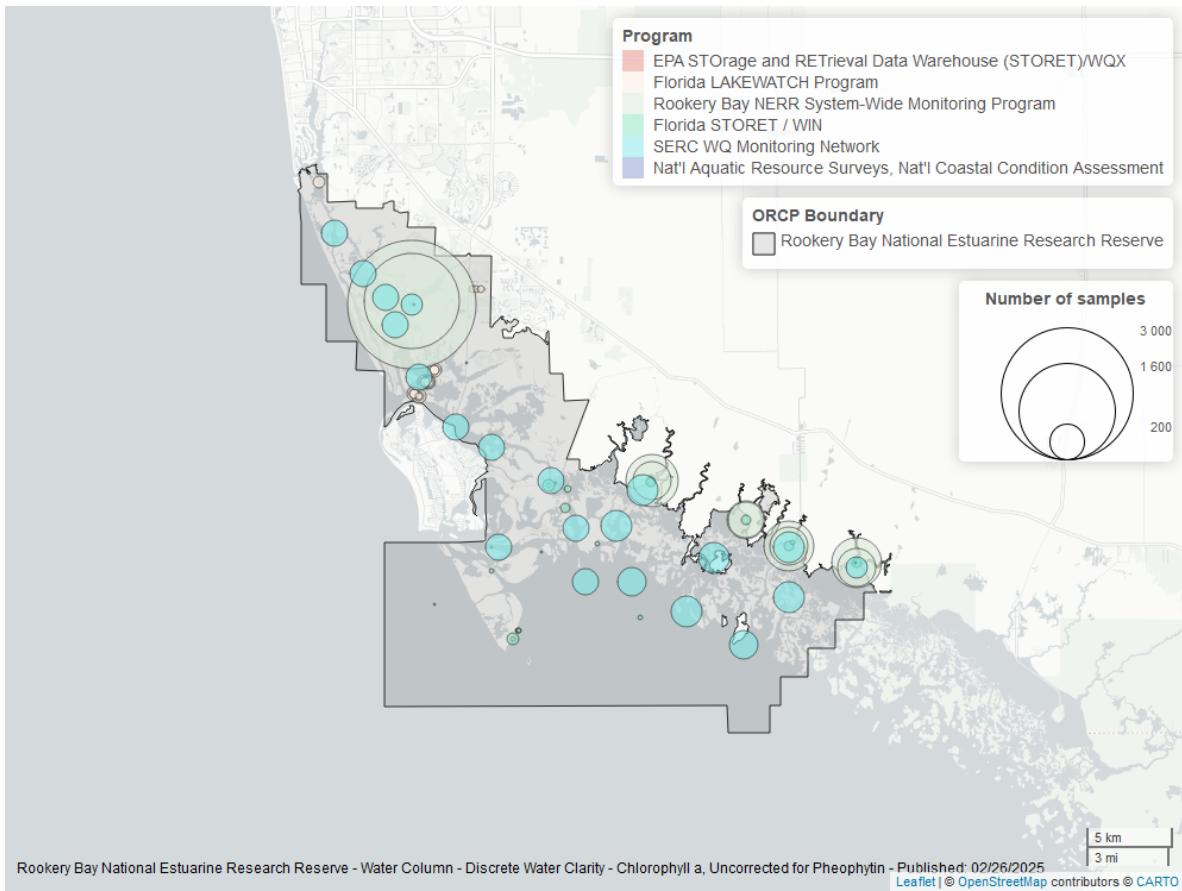


Table 18: Seasonal Kendall-Tau Results for - Chlorophyll a, Uncorrected for Pheophytin

Activity Type	Statistical Trend	Sample Count	Years with Data	Period of Record	Median Result Value	Tau	Sen Intercept	Sen Slope	P
Lab	Significantly increasing trend	5307	31	1994 - 2024	4.4	0.3249	3.5549	0.09605	0.0000



Chlorophyll a, Corrected for Pheophytin - Discrete

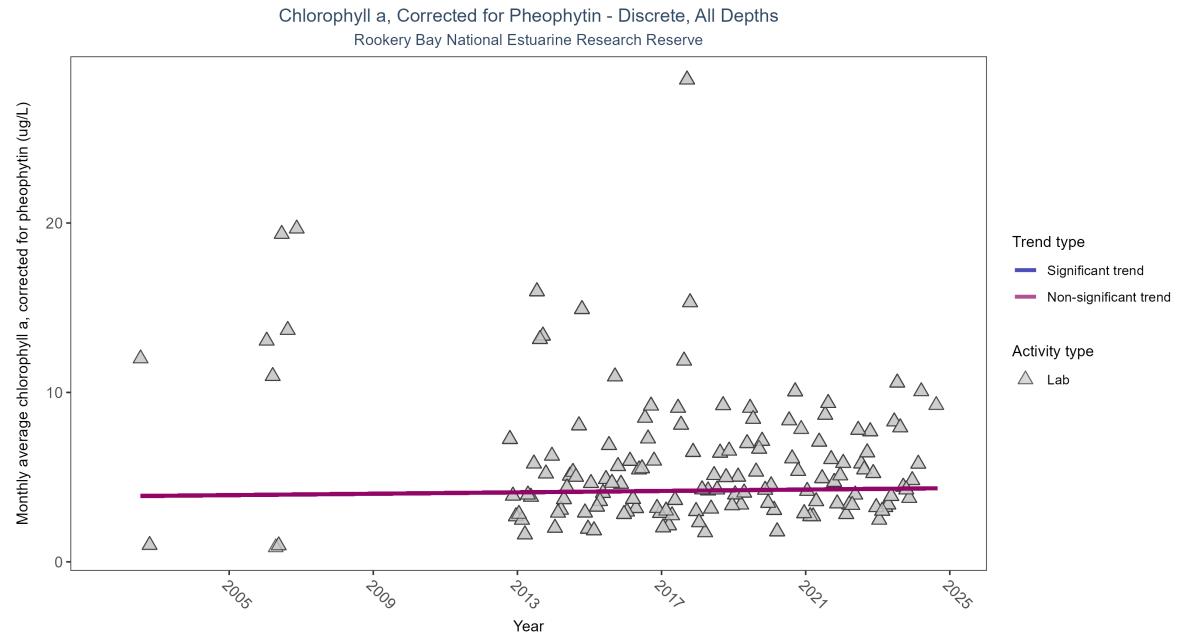
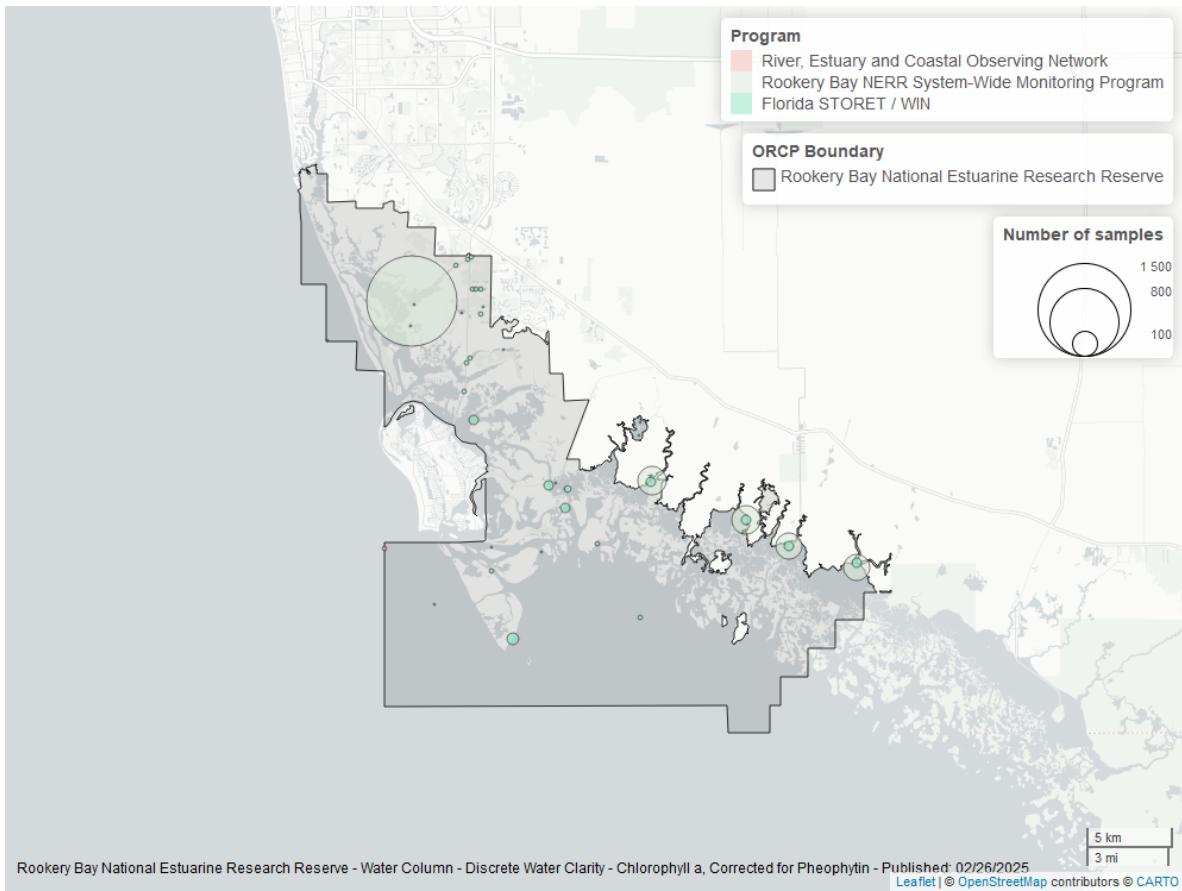


Table 19: Seasonal Kendall-Tau Results for - Chlorophyll a, Corrected for Pheophytin

Activity Type	Statistical Trend	Sample Count	Years with Data	Period of Record	Median Result Value	Tau	Sen Intercept	Sen Slope	P
Lab	No significant trend	2170	15	2002 - 2024	4.1	0.031	3.87457	0.02063	0.6191



Secchi Depth - Discrete

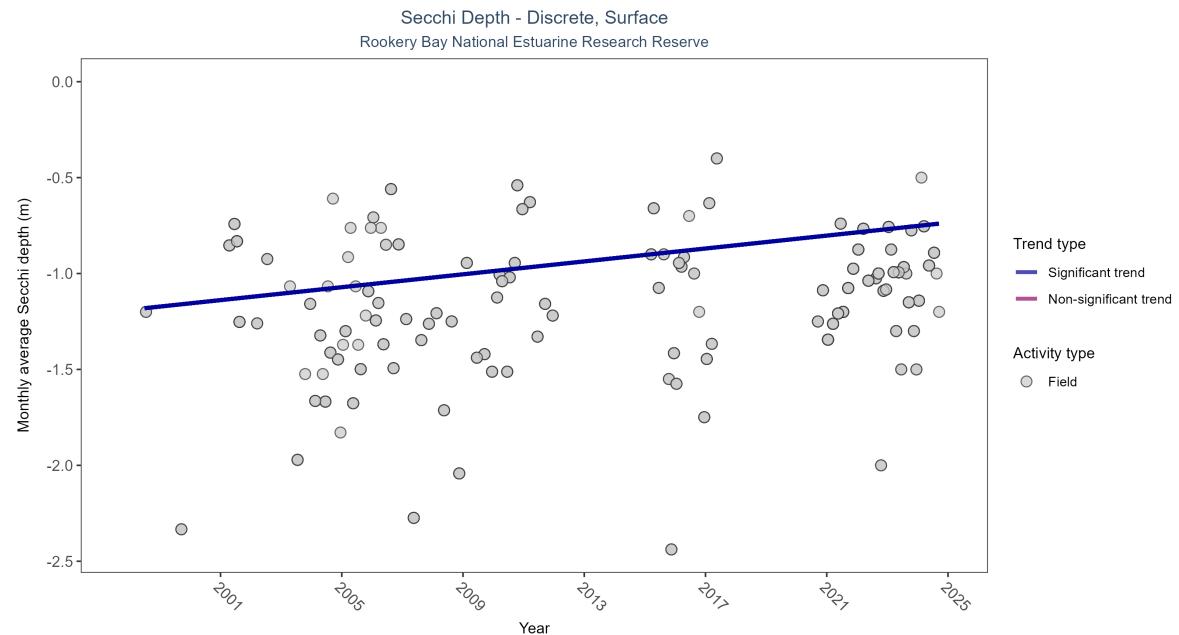
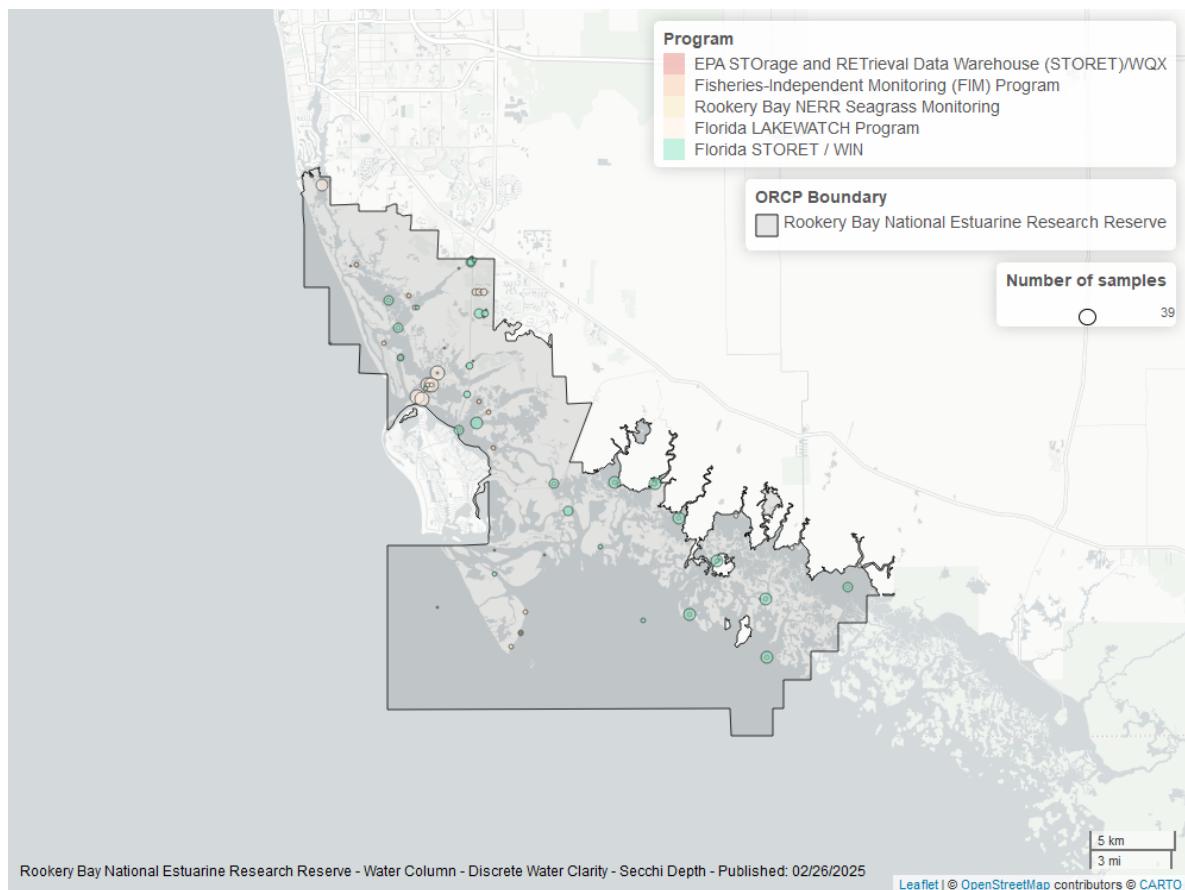


Table 20: Seasonal Kendall-Tau Results for - Secchi Depth

Activity Type	Statistical Trend	Sample Count	Years with Data	Period of Record	Median Result Value	Tau	Sen Intercept	Sen Slope	P
Field	Significantly increasing trend	756	21	1998 - 2024	-1.06681	0.2354	-1.1891	0.01681	0.0007



Colored Dissolved Organic Matter - Discrete

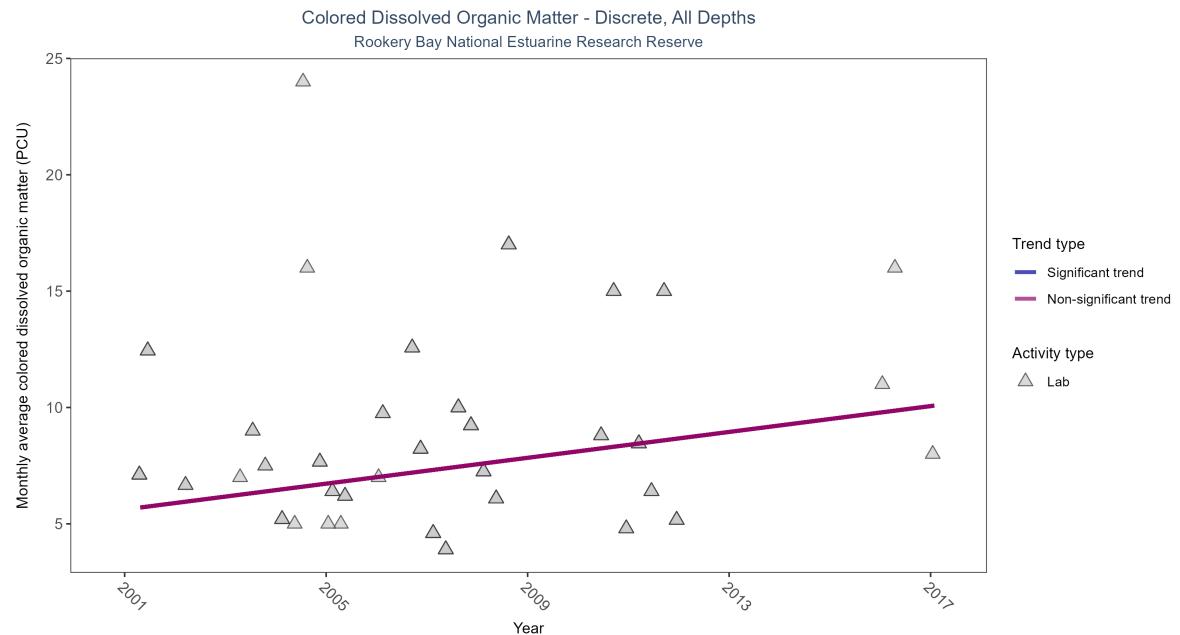


Table 21: Seasonal Kendall-Tau Results for - Colored Dissolved Organic Matter

Activity Type	Statistical Trend	Sample Count	Years with Data	Period of Record	Median Result Value	Tau	Sen Intercept	Sen Slope	P
Lab	No significant trend	193	12	2001 - 2017		8	0.3619	5.61538	0.27778 0.1533

