Apalachicola Bay Aquatic Preserve

SEACAR Water Quality Analysis

Last compiled on 10 July, 2025

Contents

Indicators

Nutrients

Total Nitrogen - Discrete

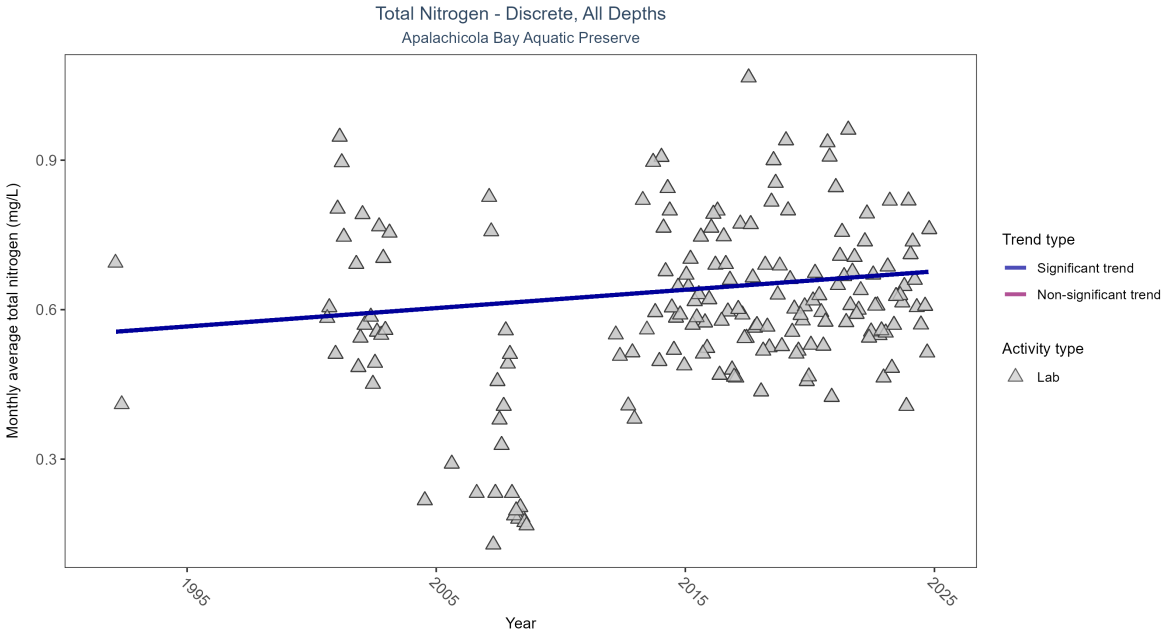

Figure 1: Scatter plot of monthly average total nitrogen over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Only nitrogen values obtained from laboratory analyses (triangles) are included in the plot.

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	Significantly increasing trend	3242	23	1992 - 2024	0.62	0.14009	0.55527	0.00368	0.0099

Monthly average total nitrogen increased by less than 0.01 mg/L per year.

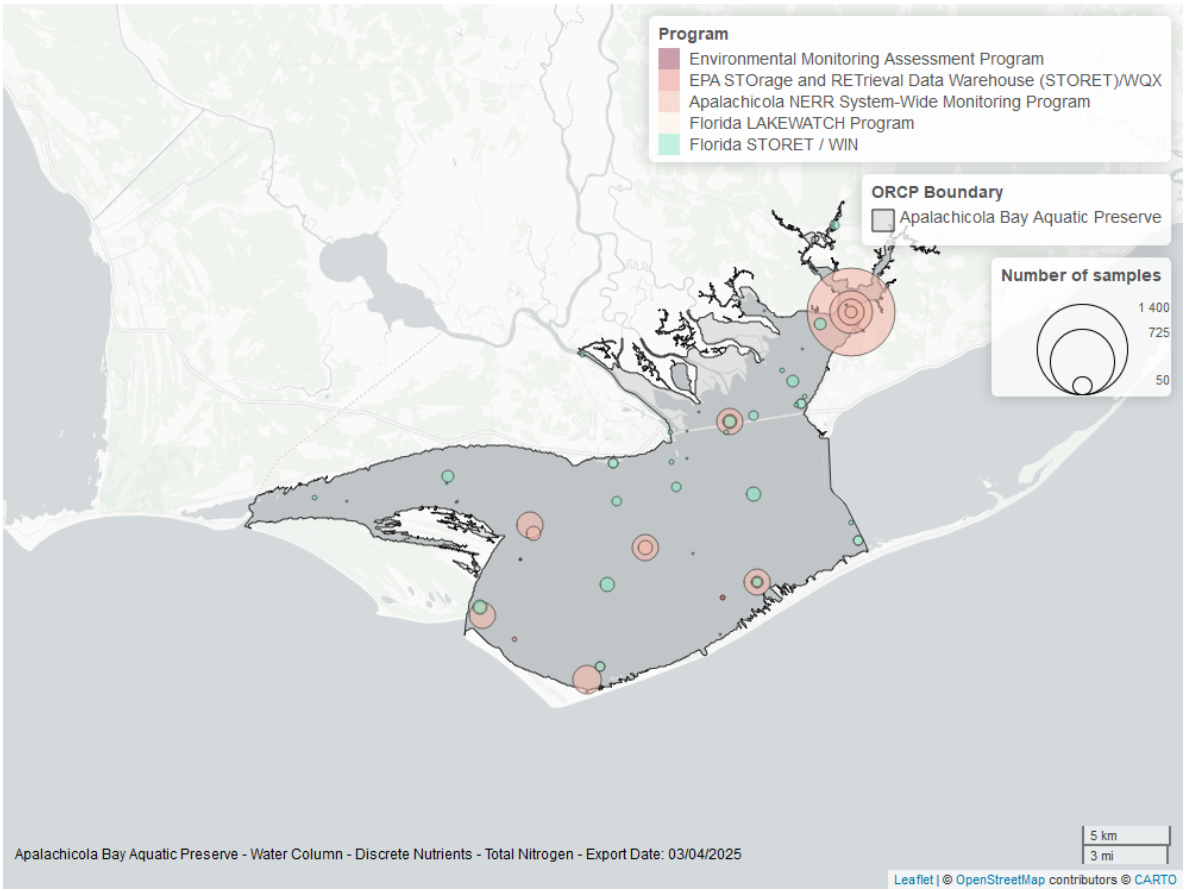

Figure 2: Map showing location of discrete water quality sampling locations within the boundaries of *Apalachicola Bay Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Total Phosphorus - Discrete

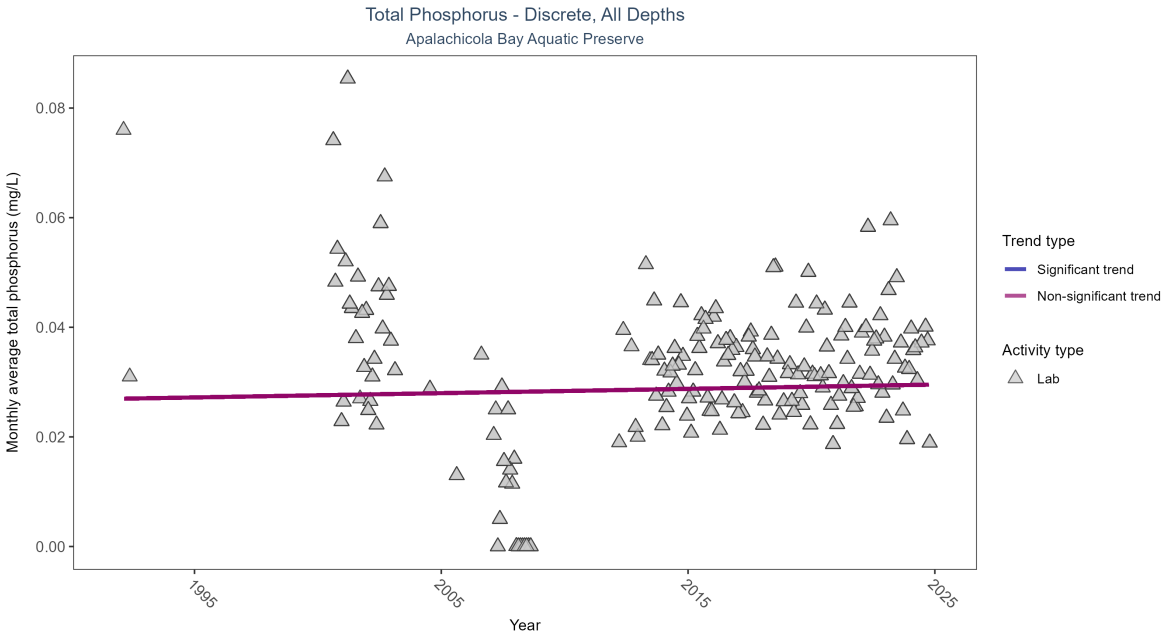

Figure 3: Scatter plot of monthly average total phosphorus over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Only phosphorus values obtained from laboratory analyses (triangles) are included in the plot.

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	No significant trend	3531	23	1992 - 2024	0.031	0.04602	0.02696	0.00008	0.4992

Total phosphorus showed no detectable trend between 1992 and 2024.

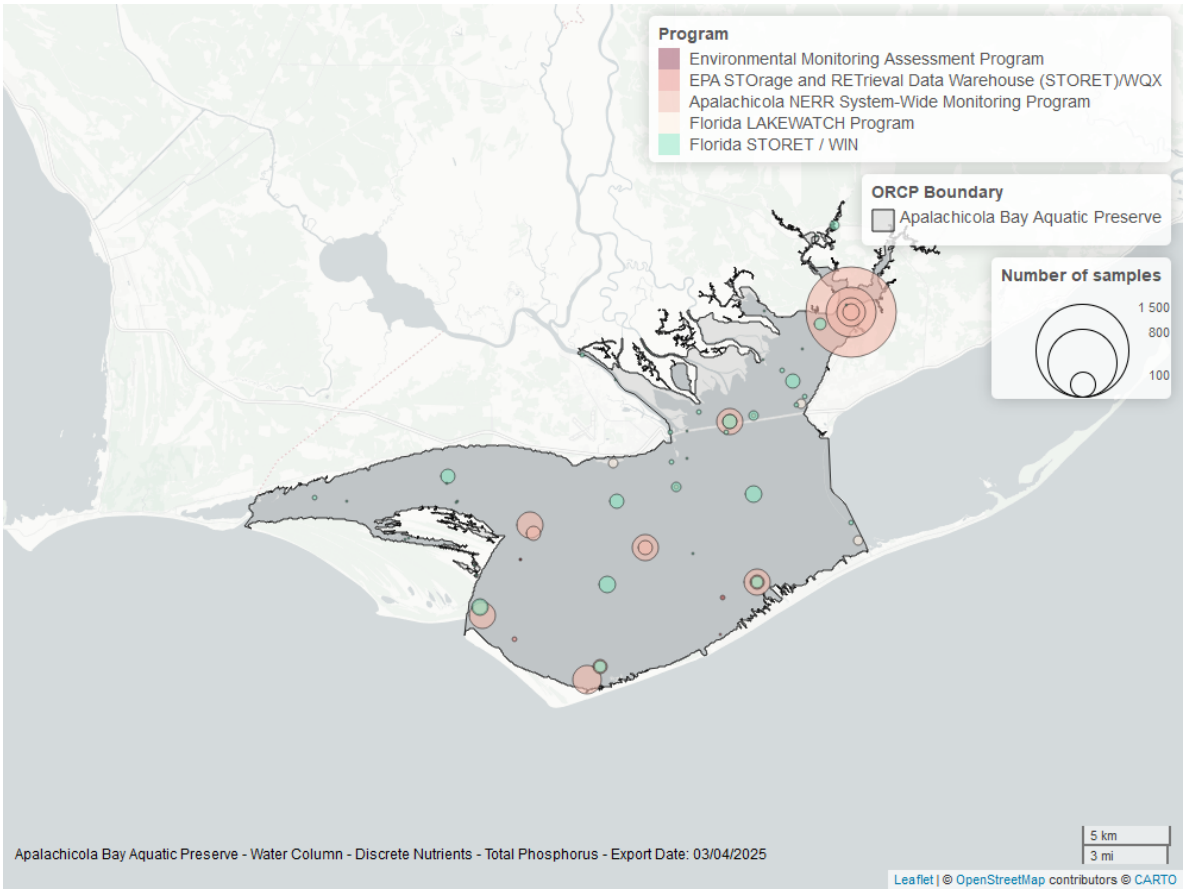

Figure 4: Map showing location of discrete water quality sampling locations within the boundaries of *Apalachicola Bay Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Water Quality

Dissolved Oxygen - Discrete

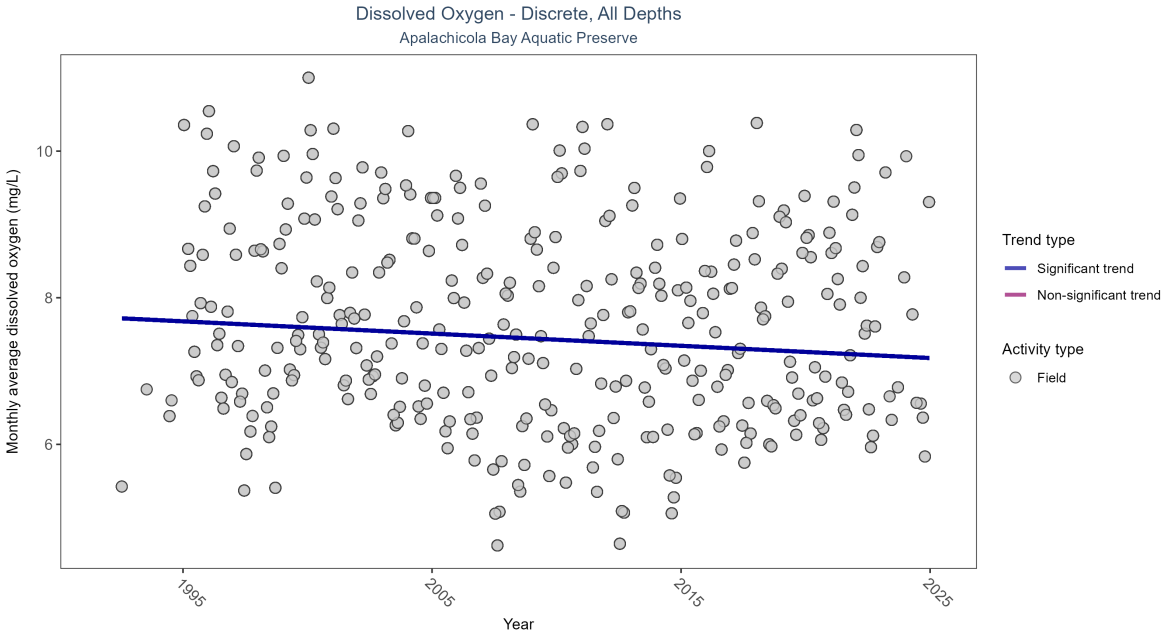

Figure 5: Scatter plot of monthly average dissolved oxygen over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Only dissolved oxygen values measured in the field (circles) are included in the plot.

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	52445	33	1992 - 2024	7.5	-0.13648	7.72796	-0.01668	0.0003

Monthly average dissolved oxygen decreased by 0.02 mg/L per year.

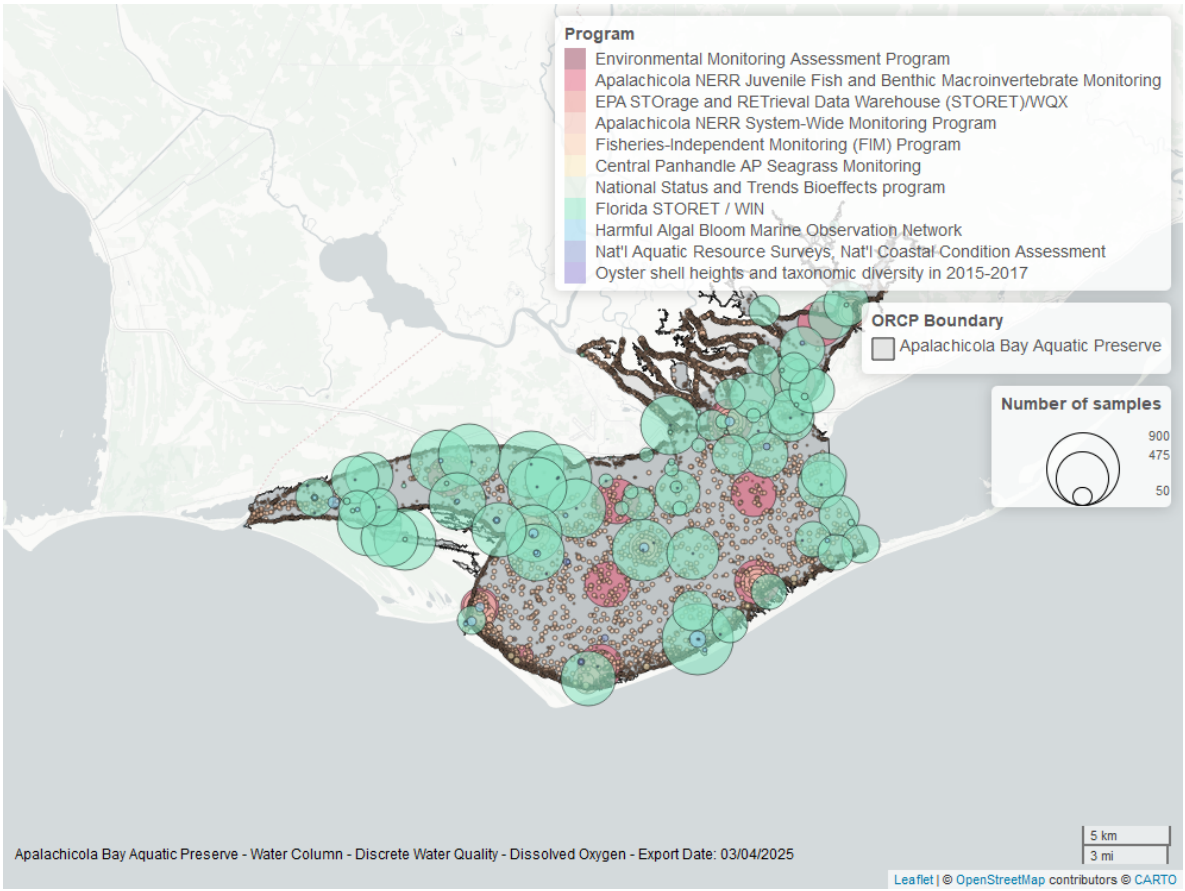

Figure 6: Map showing location of discrete water quality sampling locations within the boundaries of *Apalachicola Bay Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Dissolved Oxygen - Continuous

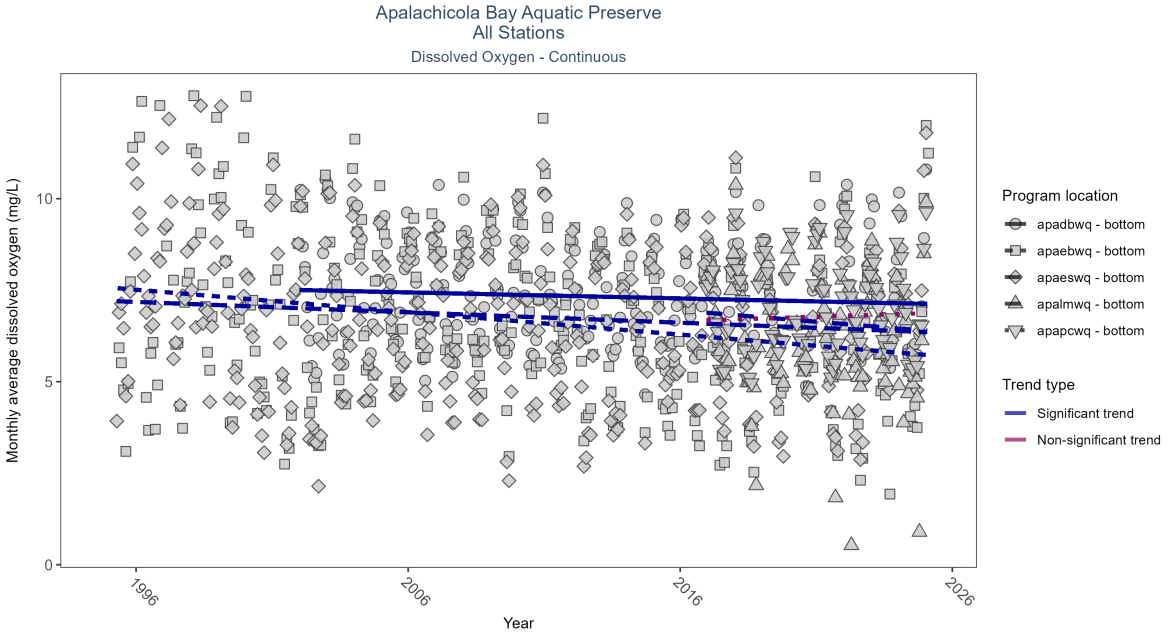

Figure 7: Scatter plot of monthly average dissolved oxygen over time at continuously monitored program locations. Each location is analyzed separately, with significant (blue) or non-significant (magenta) trend lines shown for time series that included five or more years of observations.

Table 4: Seasonal Kendall-Tau Results - Dissolved Oxygen

Program Location	Statistical Trend	Sample Count	Years with Data	Period of Record	Median Result Value	Tau	Sen Intercept	Sen Slope	P
apaebwq	Significantly decreasing trend	665356	31	1995 - 2025	6.8	-0.28	7.57	-0.06	0
apaeswq	Significantly decreasing trend	715193	31	1995 - 2025	6.8	-0.15	7.21	-0.03	0.0001
apapcwq	No significant trend	267810	10	2016 - 2025	6.9	0.07	6.66	0.02	0.3508
apadbwq	Significantly decreasing trend	621272	24	2002 - 2025	7.3	-0.15	7.50	-0.02	0.0006
apalmwq	Significantly decreasing trend	255049	10	2016 - 2025	6.3	-0.22	6.94	-0.06	0.0095

At four program locations, monthly average dissolved oxygen decreased between 0.02 and 0.06 mg/L per year. No detectable change in monthly average dissolved oxygen was observed at one location.

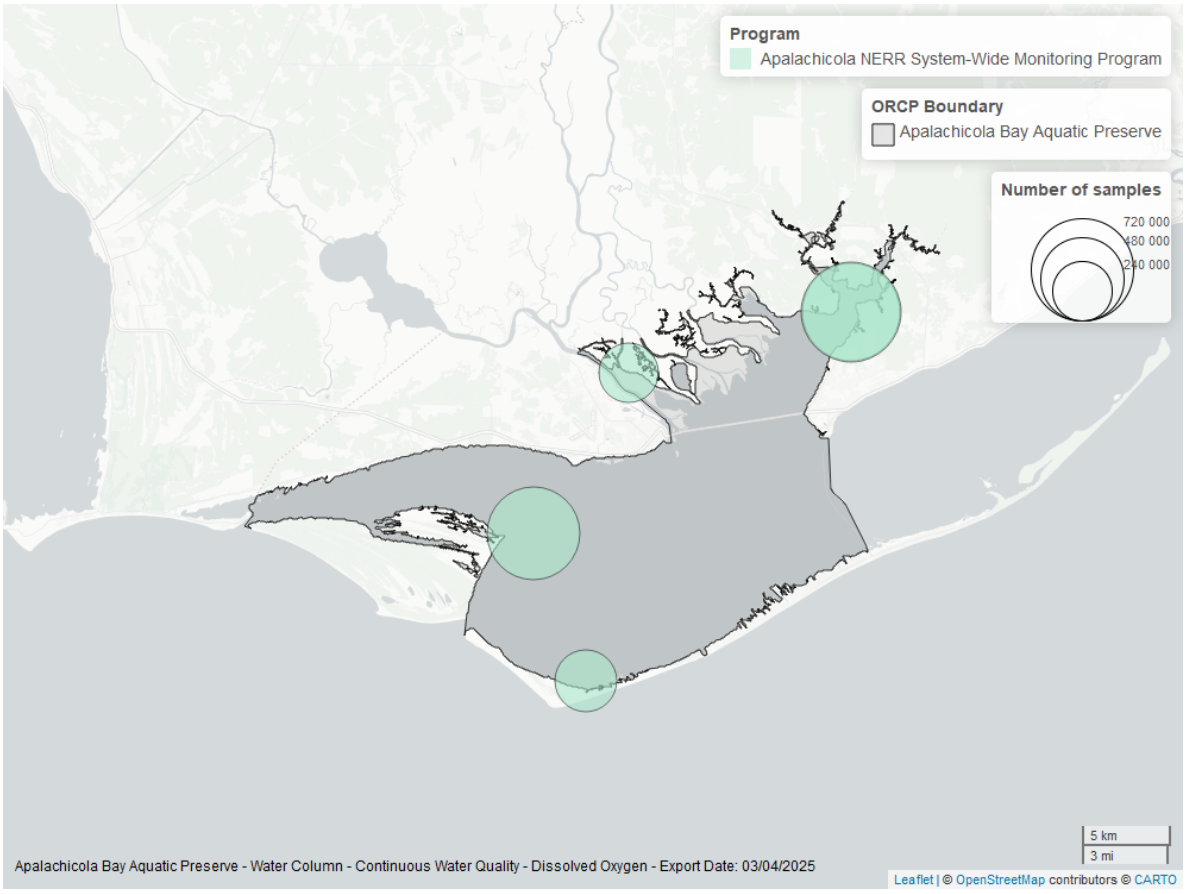

Figure 8: Map showing location of dissolved oxygen continuous water quality sampling locations within the boundaries of *Apalachicola Bay Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Dissolved Oxygen Saturation - Discrete

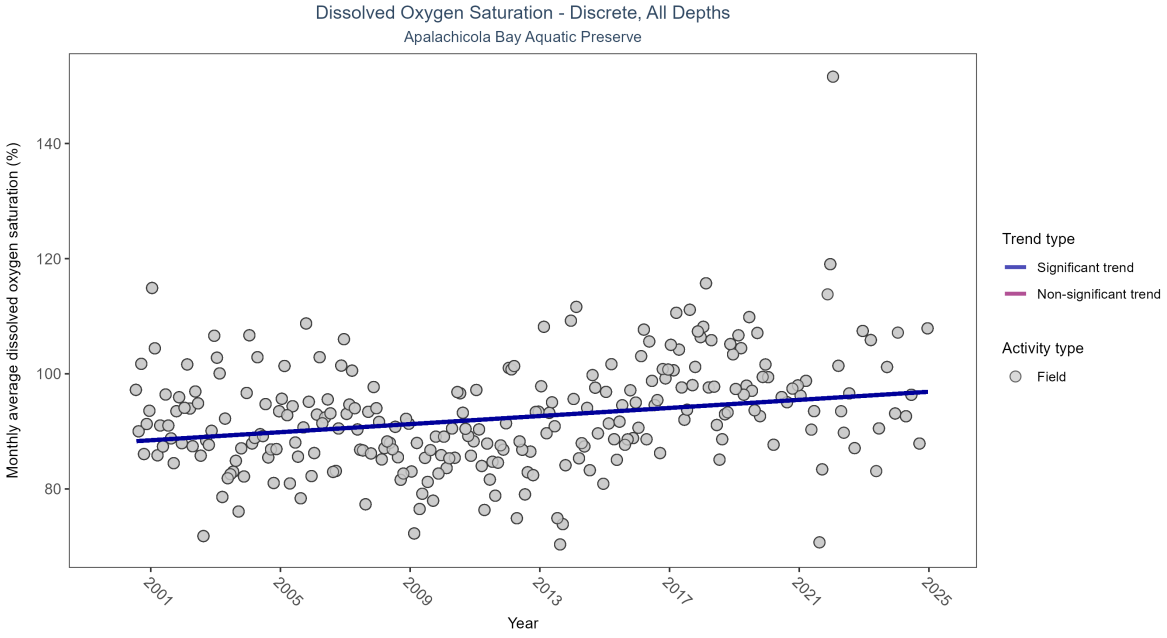

Figure 9: Scatter plot of monthly average dissolved oxygen saturation over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Only dissolved oxygen saturation values measured in the field (circles) are included in the plot.

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	Significantly increasing trend	5540	25	2000 - 2024	92.75	0.21294	88.10573	0.35082	0

Monthly average dissolved oxygen saturation increased by 0.35% per year.

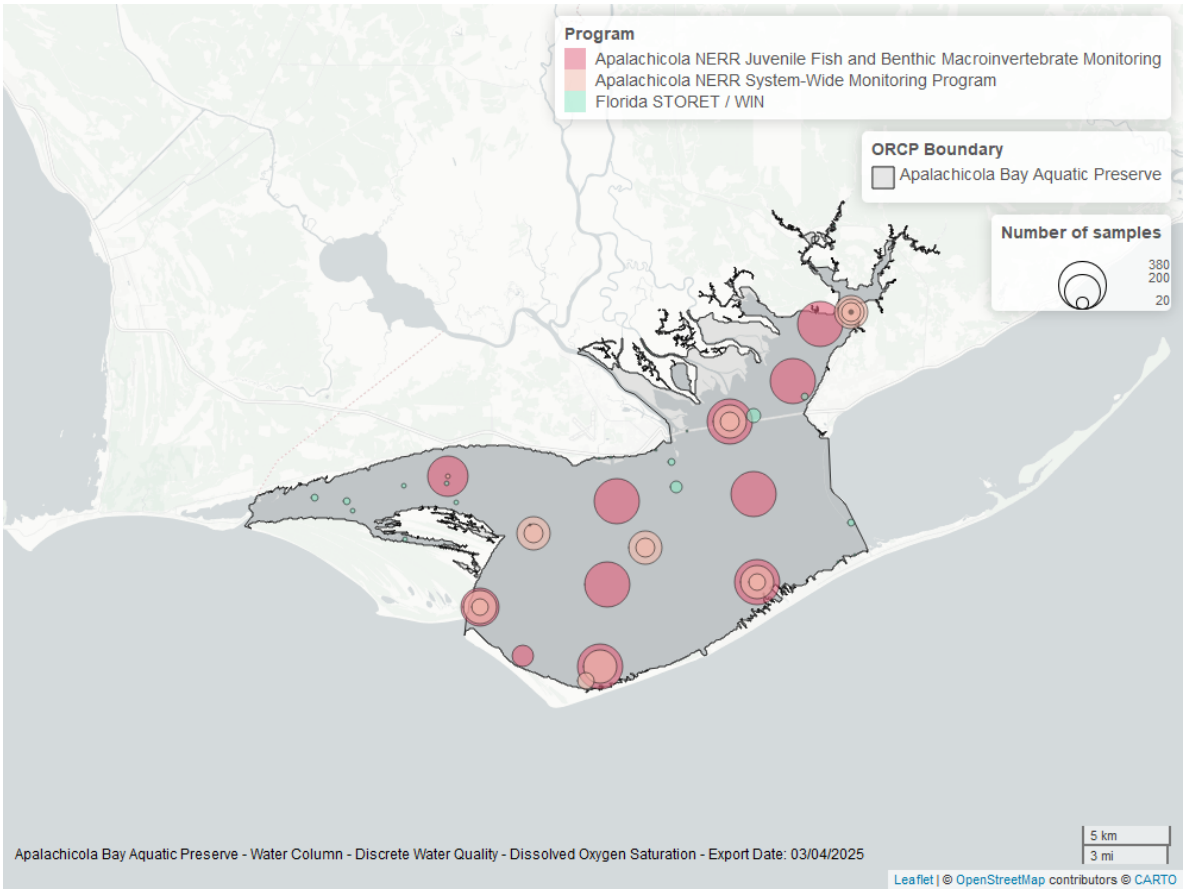

Figure 10: Map showing location of discrete water quality sampling locations within the boundaries of *Apalachicola Bay Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Dissolved Oxygen Saturation - Continuous

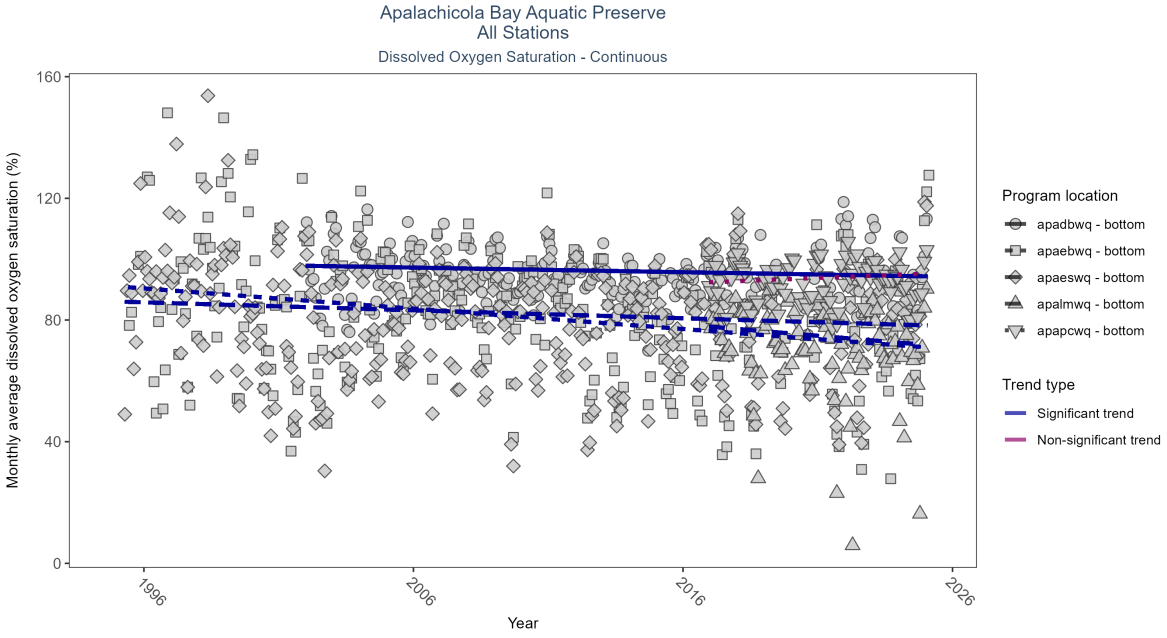

Figure 11: Scatter plot of monthly average dissolved oxygen saturation over time at continuously monitored program locations. Each location is analyzed separately, with significant (blue) or non-significant (magenta) trend lines shown for time series that included five or more years of observations.

Table 6: Seasonal Kendall-Tau Results - Dissolved Oxygen Saturation

Program Location	Statistical Trend	Sample Count	Years with Data	Period of Record	Median Result Value	Tau	Sen Intercept	Sen Slope	P
apadbwq	Significantly decreasing trend	624721	24	2002 - 2025	94.7	-0.10	97.83	-0.15	0.0247
apaeswq	Significantly decreasing trend	716357	31	1995 - 2025	84.2	-0.11	86.07	-0.26	0.0045
apaebwq	Significantly decreasing trend	661181	31	1995 - 2025	84.8	-0.25	91.06	-0.67	0
apapcwq	No significant trend	271266	10	2016 - 2025	94.1	0.11	92.05	0.35	0.1565
apalmwq	Significantly decreasing trend	255585	10	2016 - 2025	74.7	-0.22	78.57	-0.75	0.0078

At four program locations, monthly average dissolved oxygen saturation decreased between 0.15 and 0.75% per year. No detectable change in monthly average dissolved oxygen saturation was observed at one location.

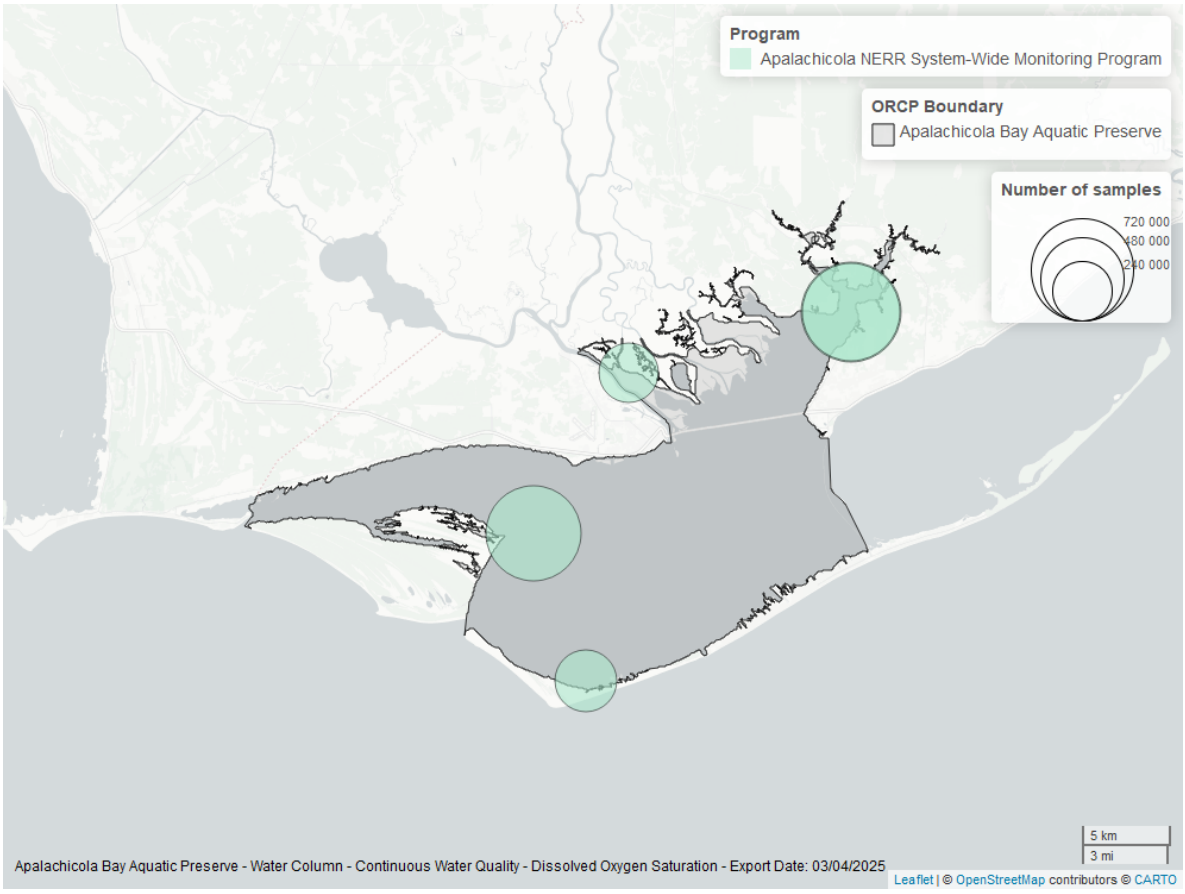

Figure 12: Map showing location of dissolved oxygen saturation continuous water quality sampling locations within the boundaries of *Apalachicola Bay Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Salinity - Discrete

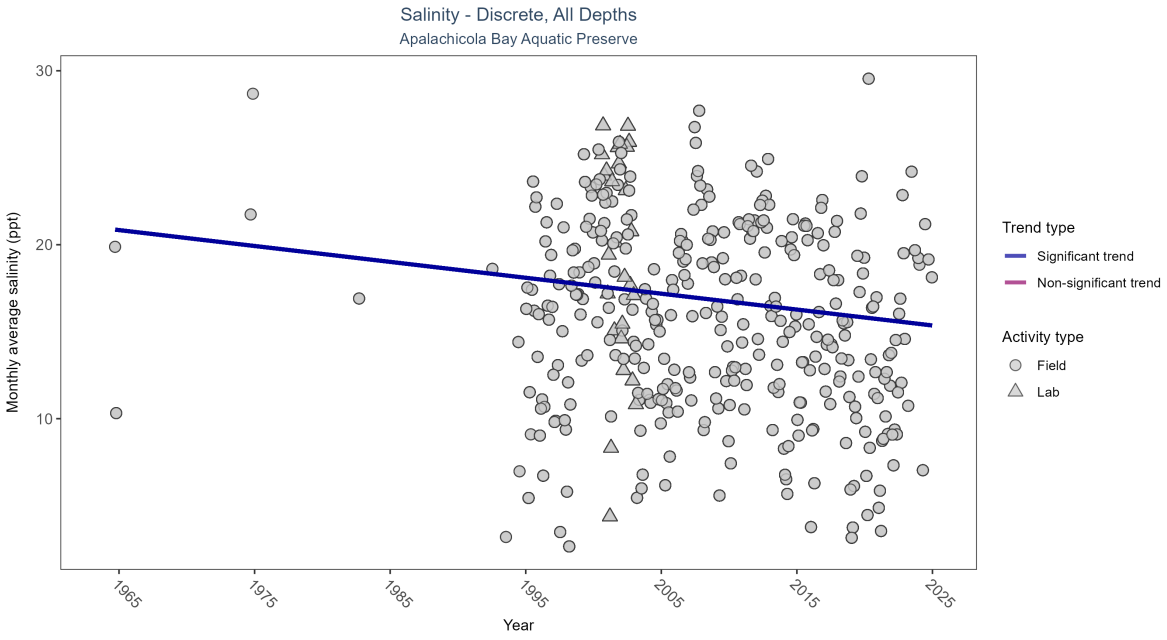

Figure 13: Scatter plot of monthly average salinity over time. If the time series included ten or more years of discrete observations, significant (blue) or non-significant (magenta) trend lines are also shown. Discrete salinity values derived from grab samples analyzed in the field (circles) or the laboratory (triangles) are both included in the plot.

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	61449	36	1964 - 2024	15.8	-0.11647	20.93299	-0.09139	0.0023

Monthly average salinity decreased by 0.09 ppt per year.

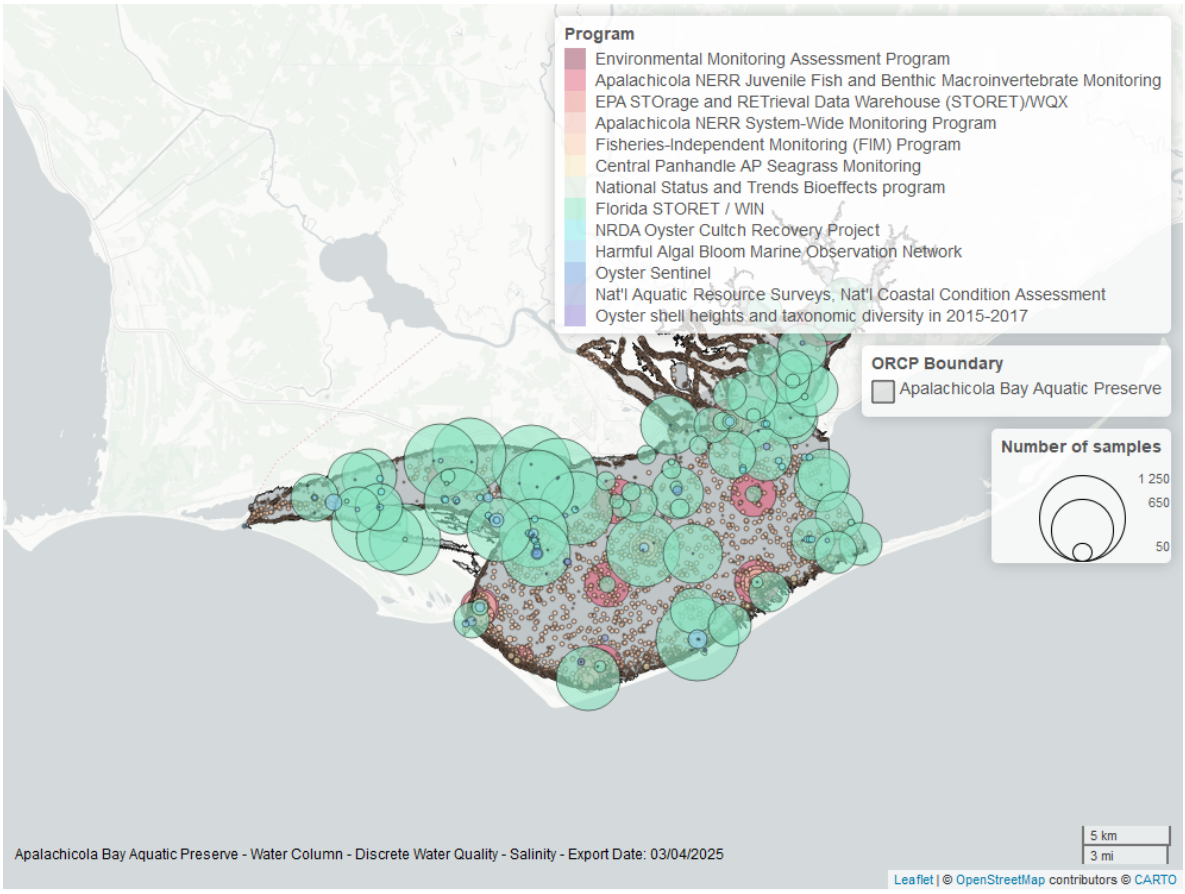

Figure 14: Map showing location of discrete water quality sampling locations within the boundaries of *Apalachicola Bay Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Salinity - Continuous

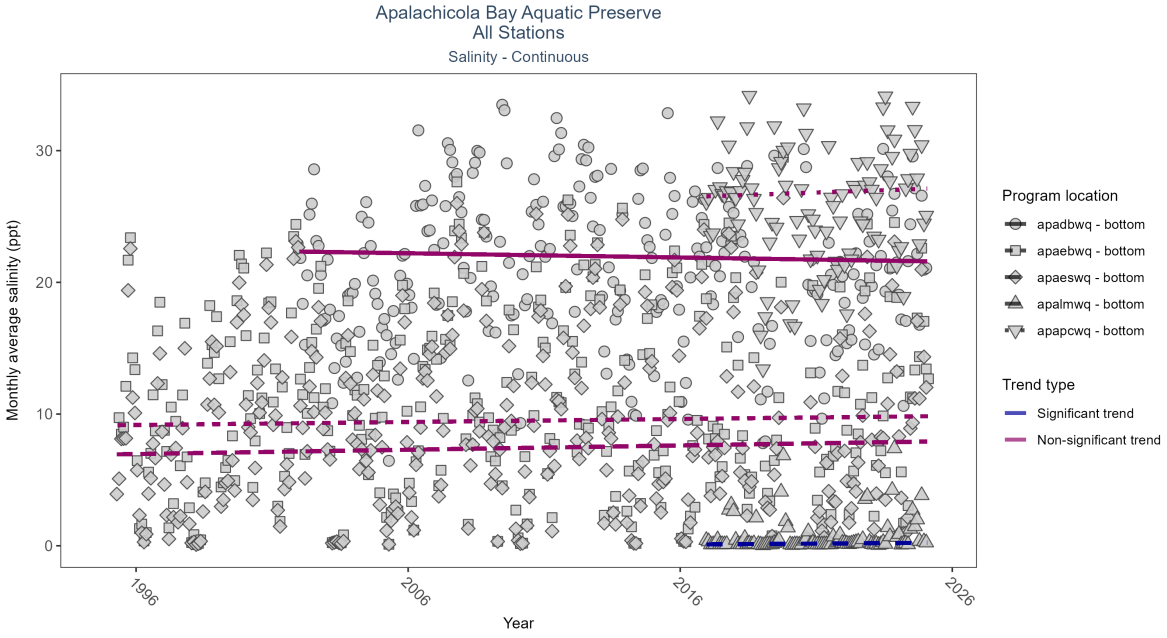

Figure 15: Scatter plot of monthly average salinity over time at continuously monitored program locations. Each location is analyzed separately, with significant (blue) or non-significant (magenta) trend lines shown for time series that included five or more years of observations.

Table 8: Seasonal Kendall-Tau Results - Salinity

Program Location	Statistical Trend	Sample Count	Years with Data	Period of Record	Median Result Value	Tau	Sen Intercept	Sen Slope	P
apaeswq	No significant trend	759370	31	1995 - 2025	7.6	0.05	6.93	0.03	0.1724
apaebwq	No significant trend	747149	31	1995 - 2025	9.9	0.04	9.14	0.02	0.3059
apadbwq	No significant trend	619355	24	2002 - 2025	22.1	-0.03	22.34	-0.03	0.4371
apalmwq	Significantly increasing trend	270761	10	2016 - 2025	0.1	0.23	0.09	0.01	0.0063
apapcwq	No significant trend	270115	10	2016 - 2025	26.8	0.03	26.46	0.07	0.7038

At one program location, monthly average salinity increased by 0.01 ppt per year. No detectable change in monthly average salinity was observed at four locations.

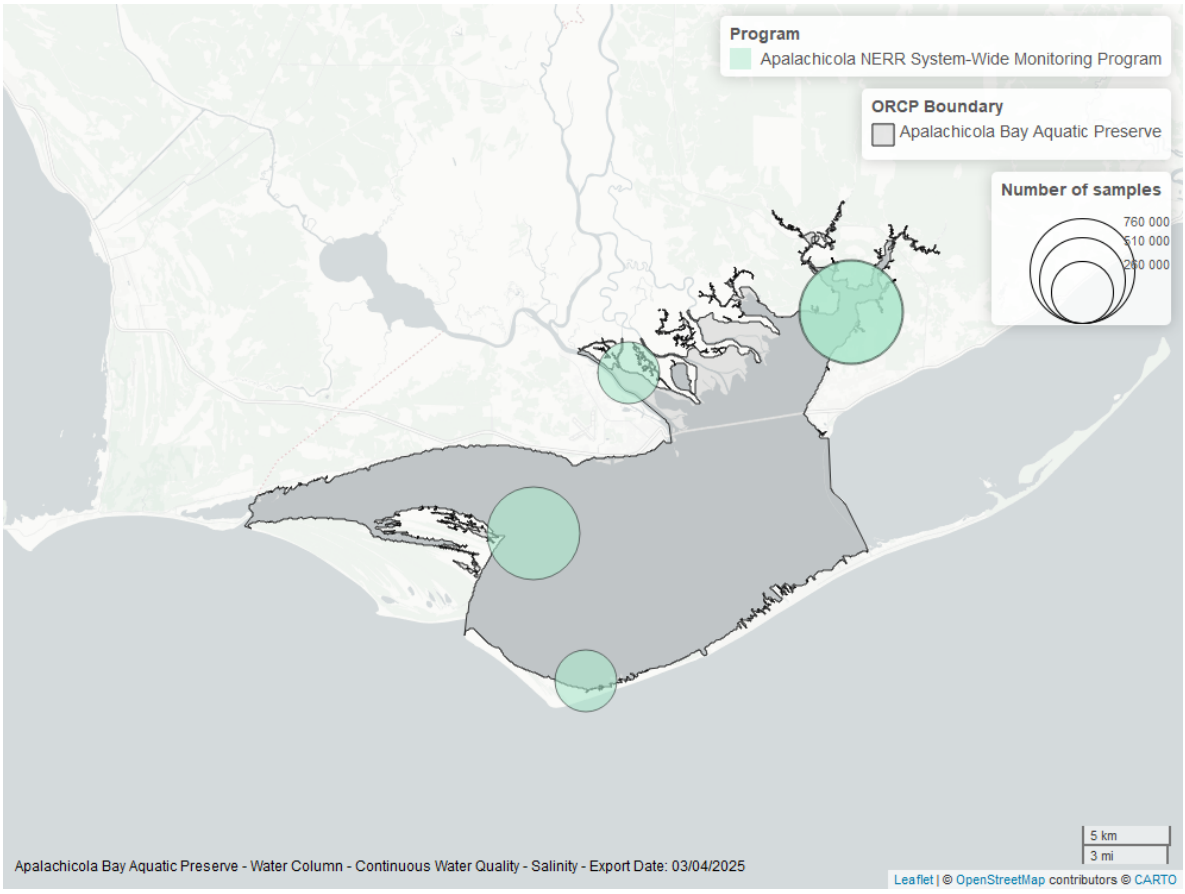

Figure 16: Map showing location of salinity continuous water quality sampling locations within the boundaries of *Apalachicola Bay Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Water Temperature - Discrete

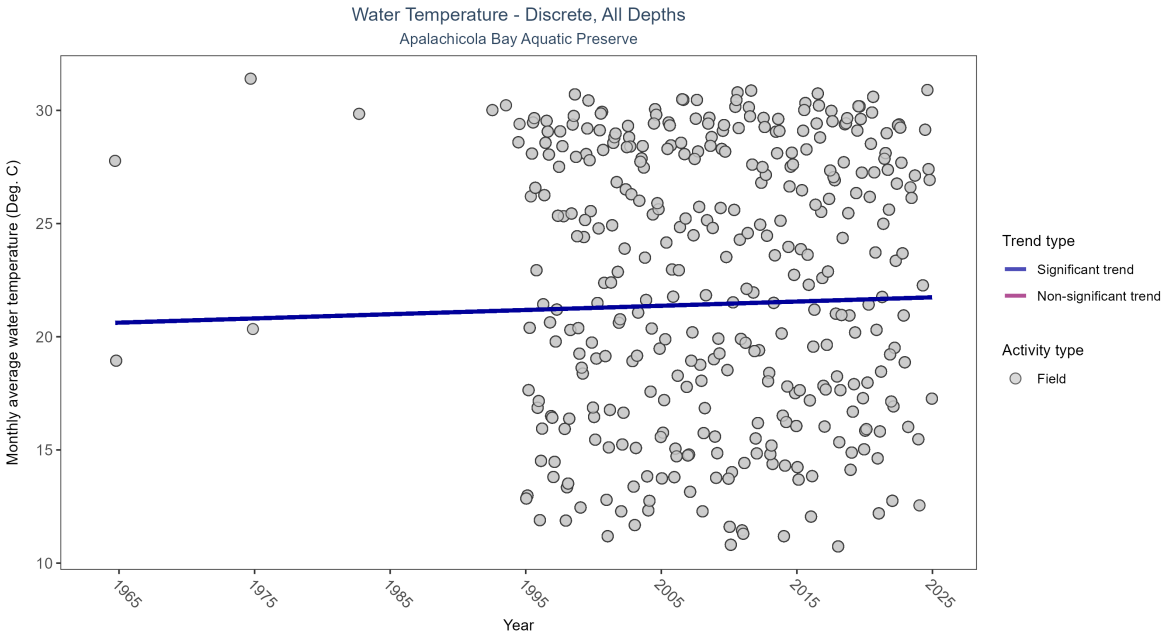

Figure 17: Scatter plot of monthly average water temperature over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Only water temperature measurements taken in the field (circles) are included in the plot.

Table 9: 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	61315	36	1964 - 2024	24	0.08861	20.60392	0.01865	0.0226

Monthly average water temperature increased by 0.02°C per year.

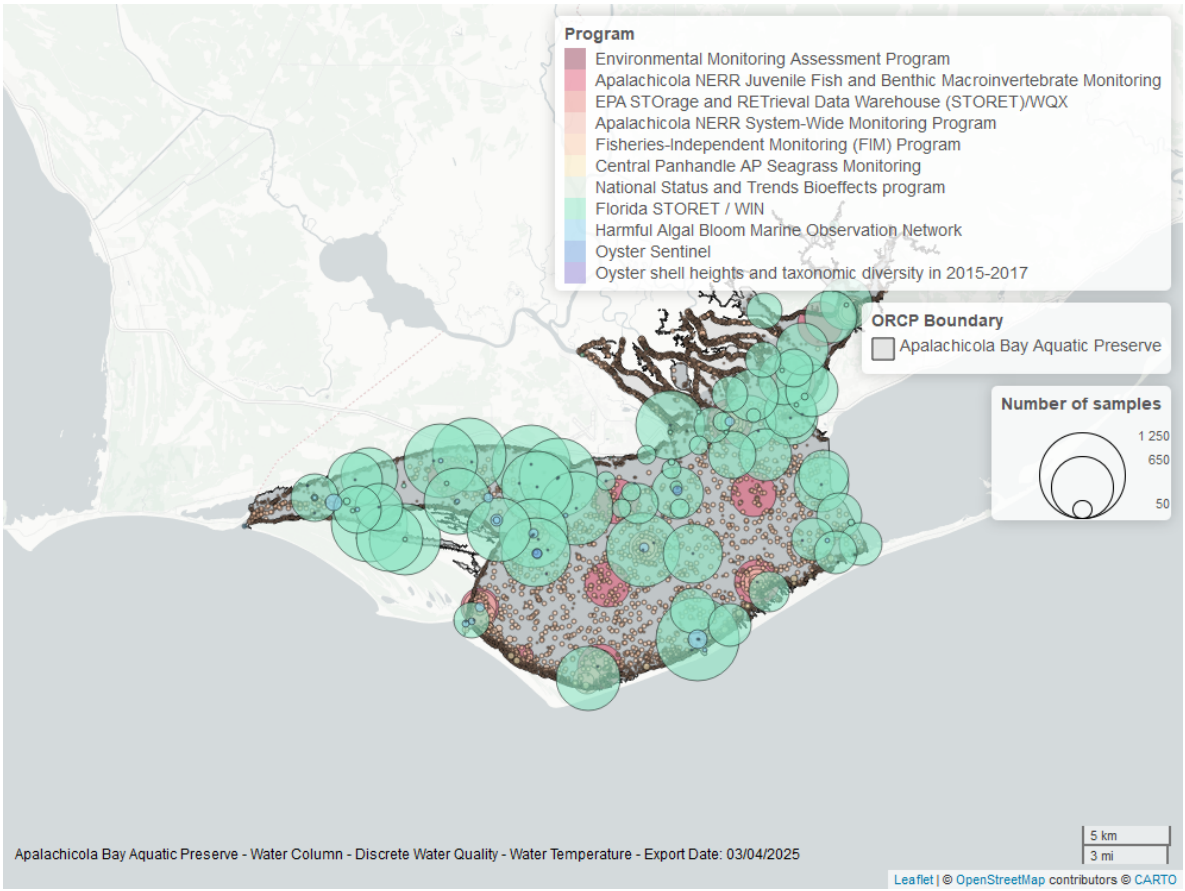

Figure 18: Map showing location of discrete water quality sampling locations within the boundaries of *Apalachicola Bay Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Water Temperature - Continuous

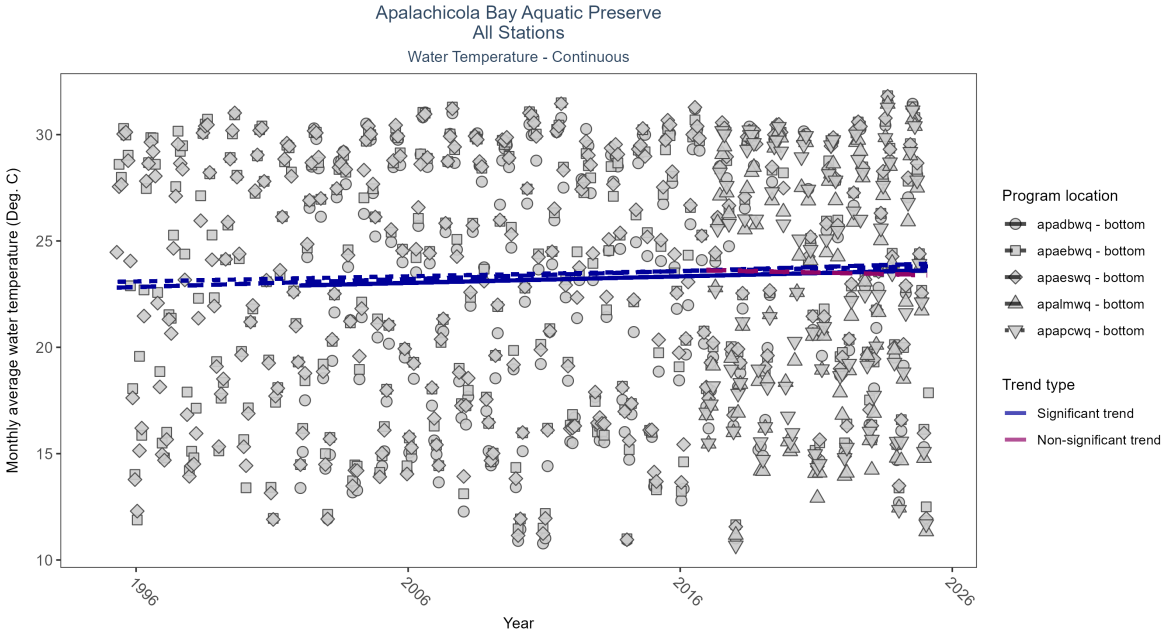

Figure 19: Scatter plot of monthly average water temperature over time at continuously monitored program locations. Each location is analyzed separately, with significant (blue) or non-significant (magenta) trend lines shown for time series that included five or more years of observations.

Table 10: Seasonal Kendall-Tau Results - Water Temperature

Program Location	Statistical Trend	Sample Count	Years with Data	Period of Record	Median Result Value	Tau	Sen Intercept	Sen Slope	P
apadbwq	Significantly increasing trend	644531	24	2002 - 2025	23.3	0.14	22.90	0.03	0.0011
apaeswq	Significantly increasing trend	768616	31	1995 - 2025	24.2	0.19	22.80	0.04	0
apalmwq	No significant trend	273020	10	2016 - 2025	22.6	-0.03	23.64	-0.02	0.7038
apaebwq	Significantly increasing trend	762203	31	1995 - 2025	24.2	0.15	23.07	0.02	0.0001
apapcwq	No significant trend	273607	10	2016 - 2025	23.1	-0.06	23.68	-0.03	0.468

At three program locations, monthly average water temperature increased between 0.02 and 0.04°C per year. No detectable change in monthly average water temperature was observed at two locations.

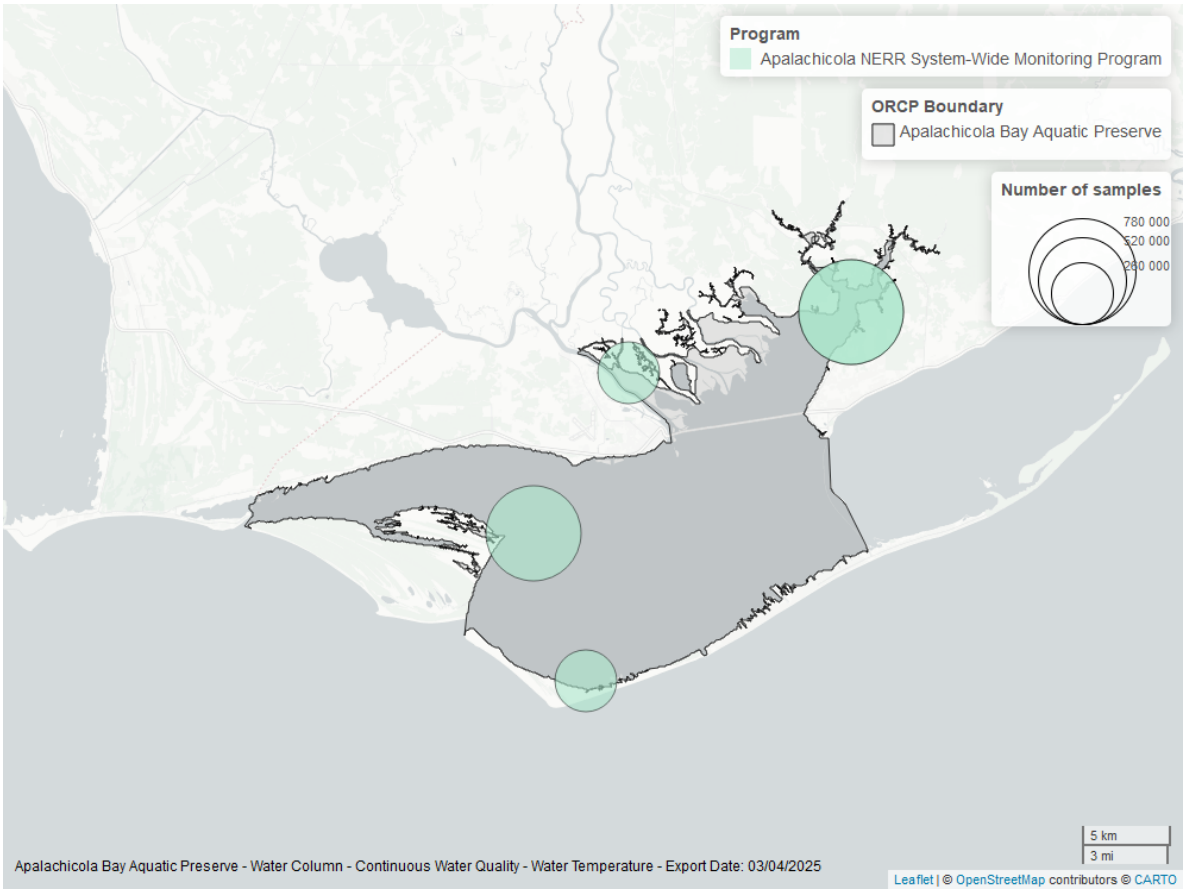

Figure 20: Map showing location of water temperature continuous water quality sampling locations within the boundaries of *Apalachicola Bay Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

pH - Discrete

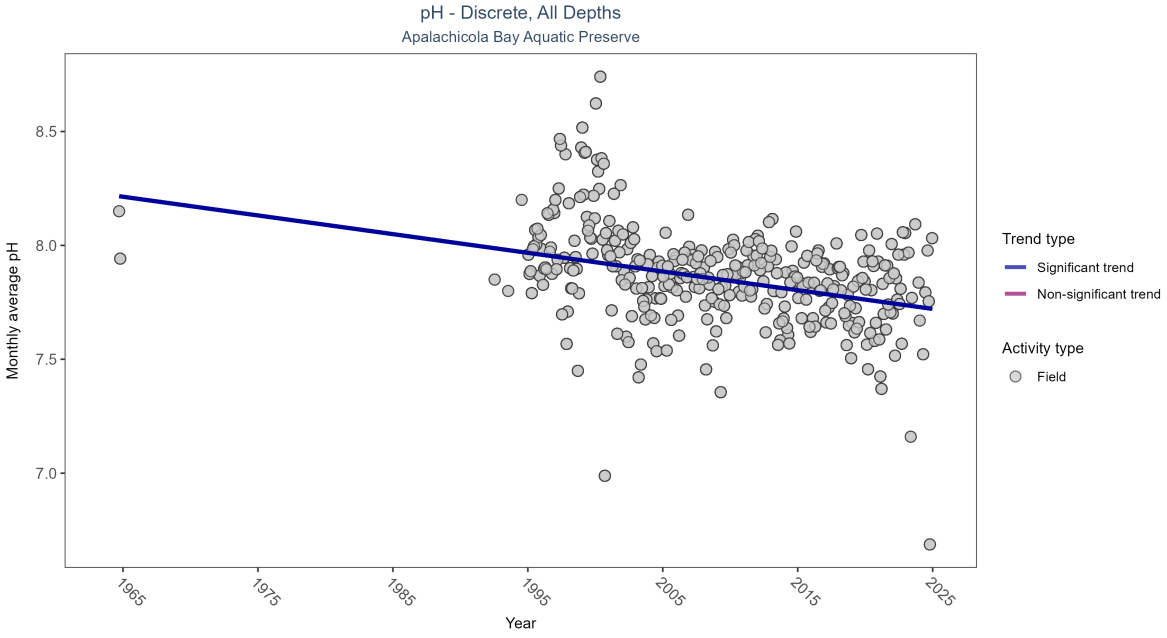

Figure 21: Scatter plot of monthly average pH over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Only pH values measured in the field (circles) are included in the plot.

Table 11: 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	40959	34	1964 - 2024	8	-0.27687	8.22181	-0.00821	0

Monthly average pH decreased by 0.01 pH units per year.

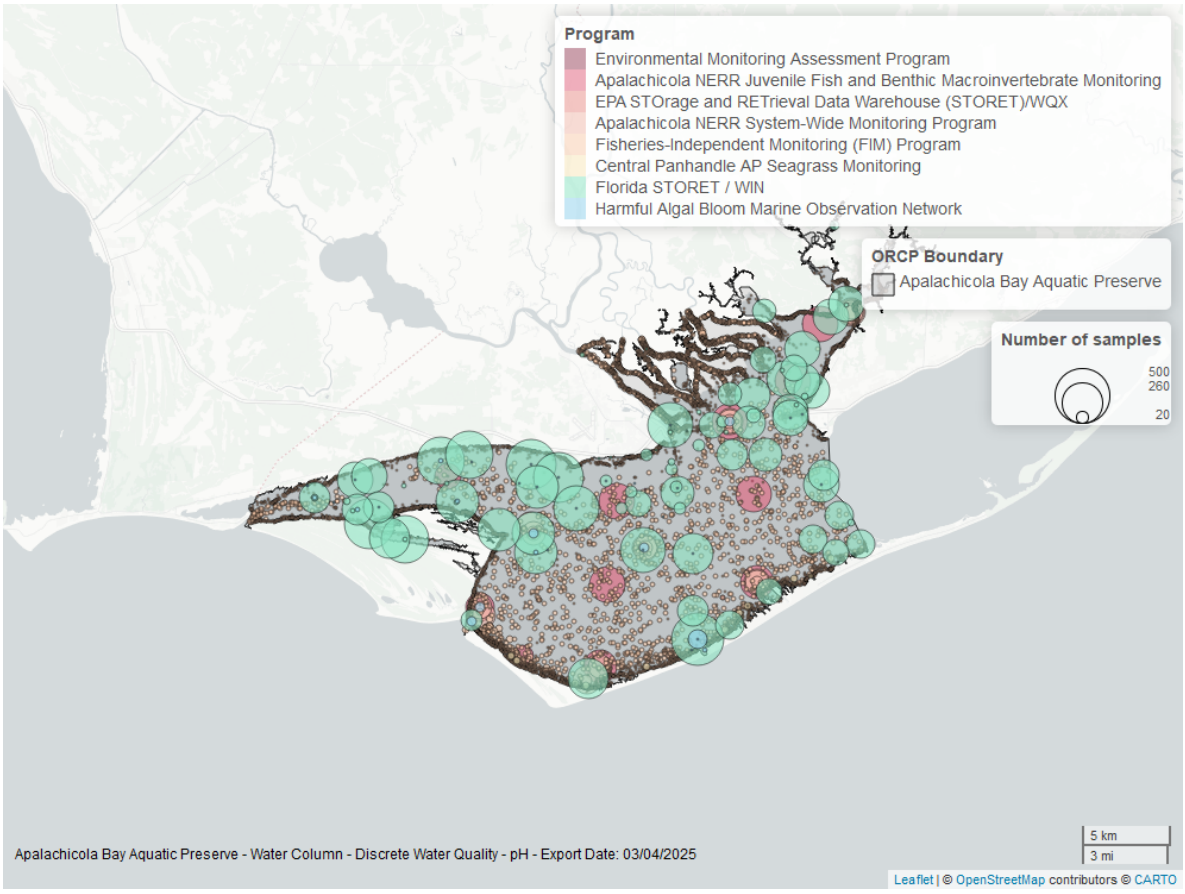

Figure 22: Map showing location of discrete water quality sampling locations within the boundaries of *Apalachicola Bay Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

pH - Continuous

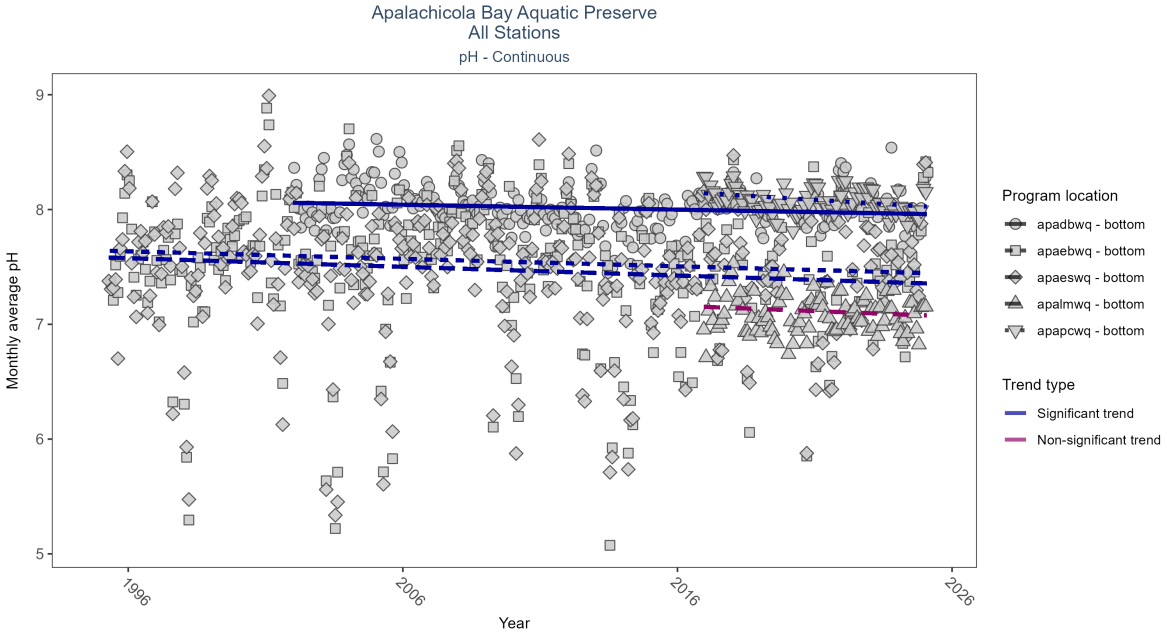

Figure 23: Scatter plot of monthly average pH over time at continuously monitored program locations. Each location is analyzed separately, with significant (blue) or non-significant (magenta) trend lines shown for time series that included five or more years of observations.

Table 12: Seasonal Kendall-Tau Results - pH

Program Location	Statistical Trend	Sample Count	Years with Data	Period of Record	Median Result Value	Tau	Sen Intercept	Sen Slope	P
apadbwq	Significantly decreasing trend	602330	24	2002 - 2025	8.0	-0.14	8.06	0.00	0.0019
apalmwq	No significant trend	263183	10	2016 - 2025	7.1	-0.07	7.16	-0.01	0.4267
apaebwq	Significantly decreasing trend	717948	31	1995 - 2025	7.6	-0.11	7.64	-0.01	0.0029
apaeswq	Significantly decreasing trend	719429	31	1995 - 2025	7.5	-0.12	7.58	-0.01	0.0011
apapcwq	Significantly decreasing trend	267739	10	2016 - 2025	8.1	-0.28	8.16	-0.01	0.0006

At four program locations, monthly average pH decreased between less than 0.01 and 0.01 pH units per year. No detectable change in monthly average pH was observed at one location.

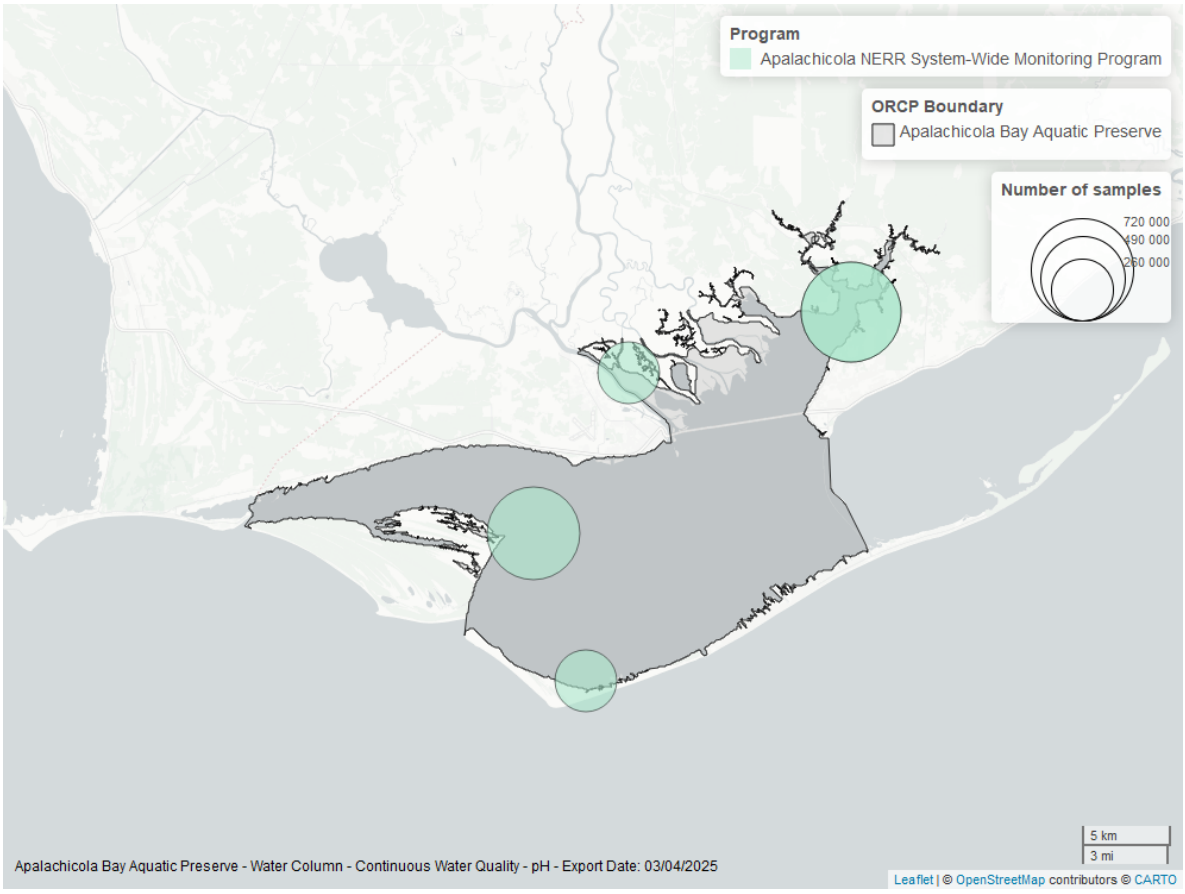

Figure 24: Map showing location of ph continuous water quality sampling locations within the boundaries of *Apalachicola Bay Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Water Clarity

Turbidity - Discrete

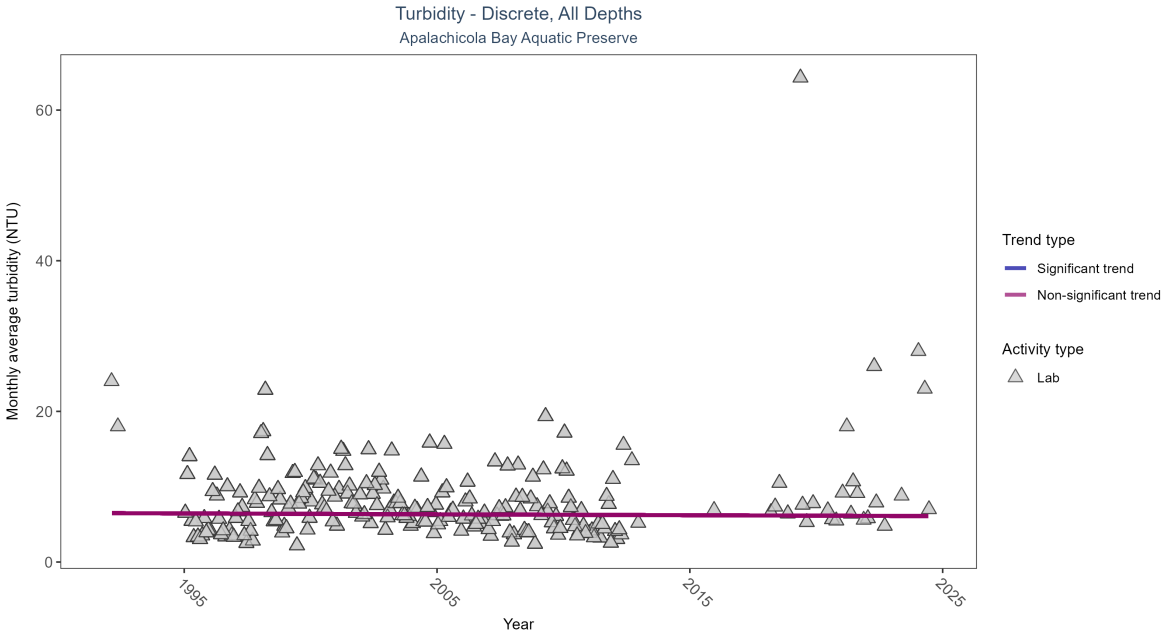

Figure 25: Scatter plot of monthly average turbidity over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Only turbidity values measured in the laboratory (triangles) are included in the plot.

Table 13: 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	No significant trend	15518	27	1992 - 2024	5.6	-0.02593	6.48776	-0.01191	0.6339

Turbidity showed no detectable trend between 1992 and 2024.

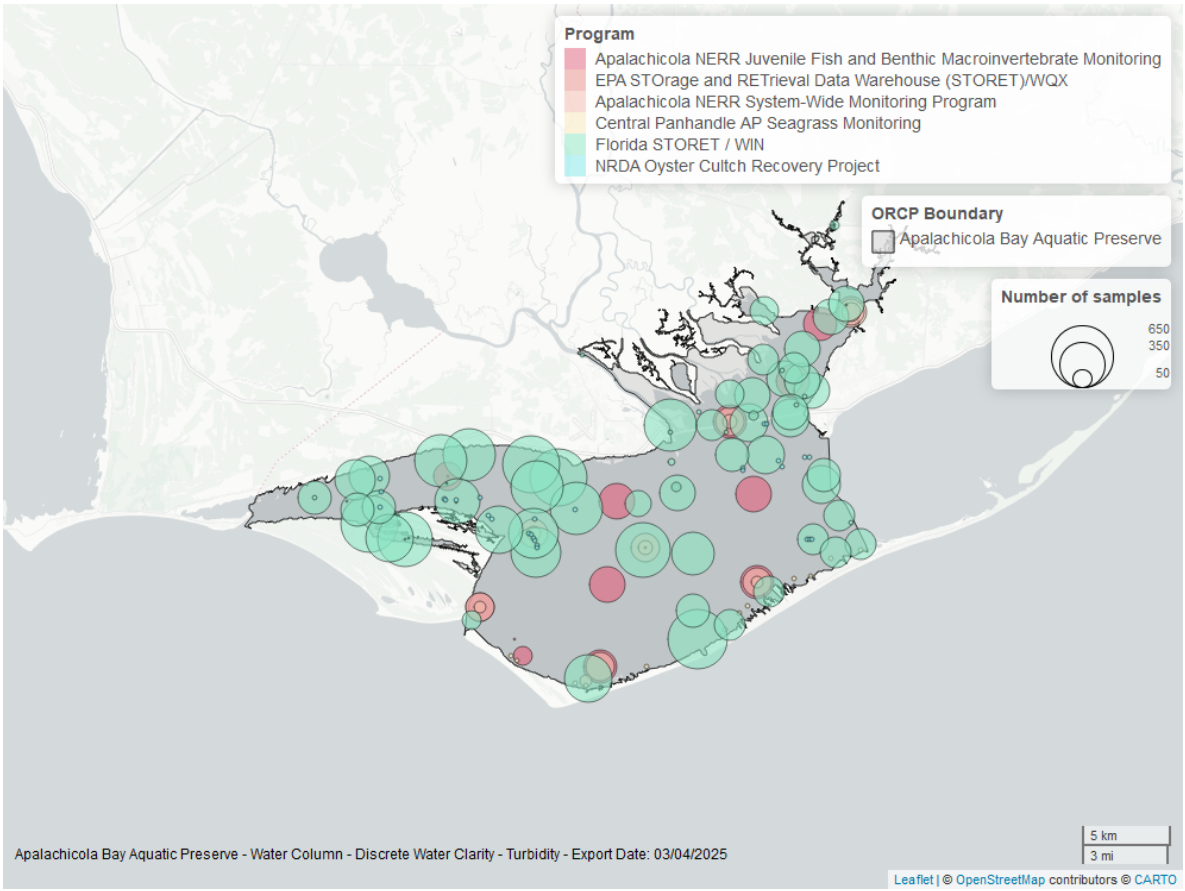

Figure 26: Map showing location of discrete water quality sampling locations within the boundaries of *Apalachicola Bay Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Turbidity - Continuous

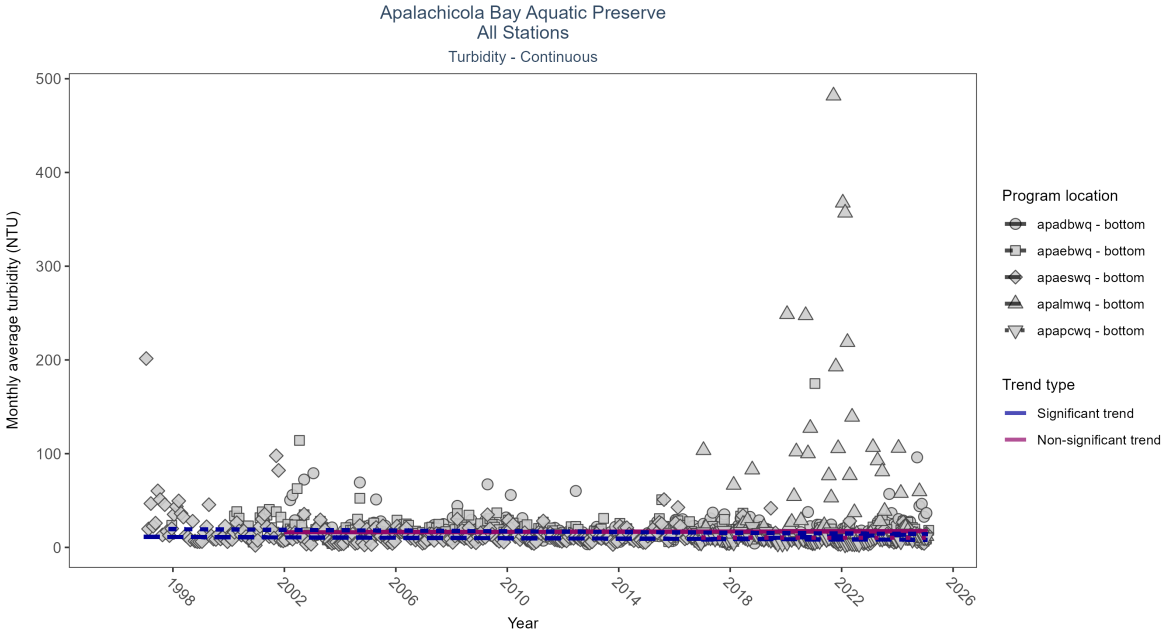

Figure 27: Scatter plot of monthly average turbidity over time at continuously monitored program locations. Each location is analyzed separately, with significant (blue) or non-significant (magenta) trend lines shown for time series that included five or more years of observations.

Table 14: Seasonal Kendall-Tau Results - Turbidity

Program Location	Statistical Trend	Sample Count	Years with Data	Period of Record	Median Result Value	Tau	Sen Intercept	Sen Slope	P
apaeswq	Significantly decreasing trend	703229	30	1996 - 2025	9	-0.15	11.32	-0.11	0.0002
apapcwq	No significant trend	258576	10	2016 - 2025	7	-0.03	10.47	-0.03	0.7795
apaebwq	Significantly decreasing trend	635704	27	1997 - 2025	13	-0.19	19.68	-0.19	0
apadbwq	No significant trend	605643	24	2002 - 2025	10	0.04	16.11	0.05	0.3209
apalmwq	Significantly increasing trend	245206	10	2016 - 2025	12	0.20	7.63	0.70	0.0173

At one program location, monthly average turbidity increased by 0.70 NTU per year. At two program locations, monthly average turbidity decreased by 0.11 NTU per year at one site and by 0.19 NTU per year at the other. No detectable change in monthly average turbidity was observed at two locations.

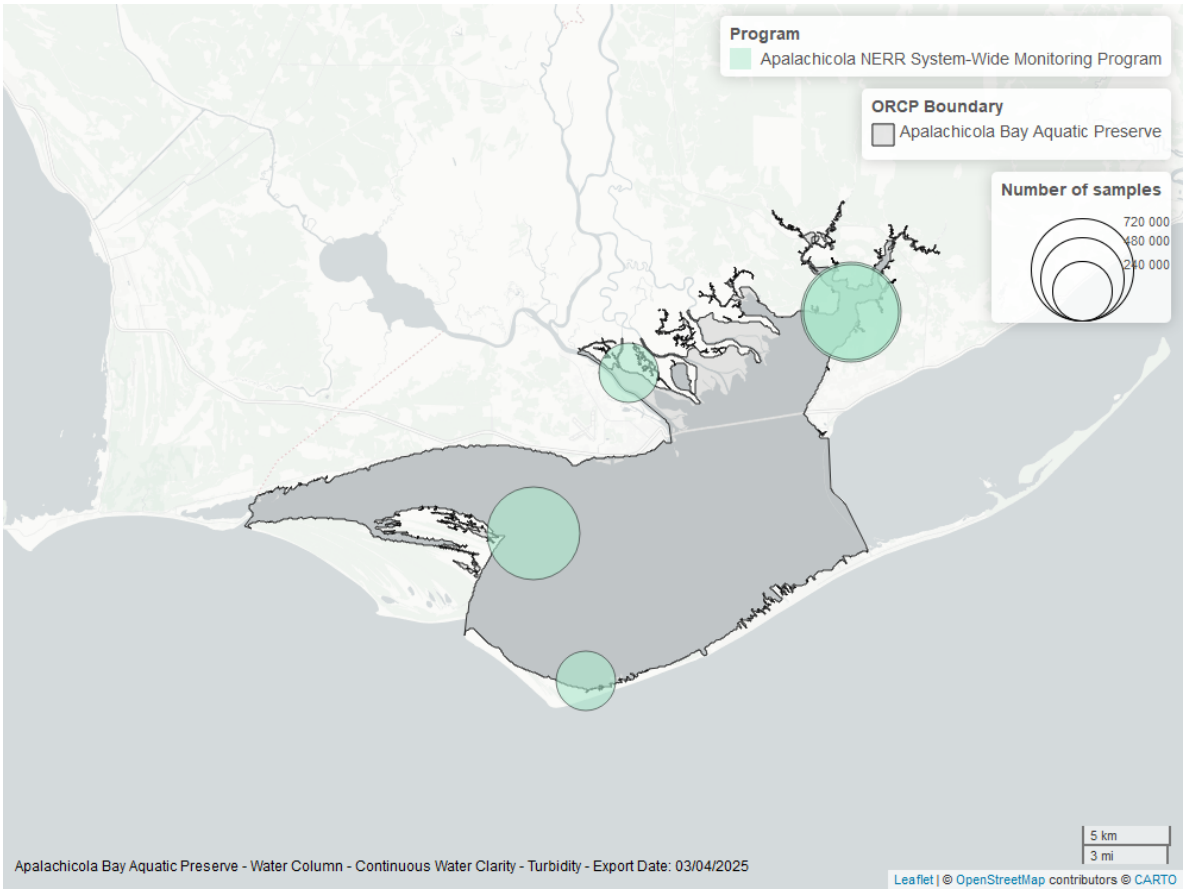

Figure 28: Map showing location of turbidity continuous water quality sampling locations within the boundaries of *Apalachicola Bay Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Total Suspended Solids - Discrete

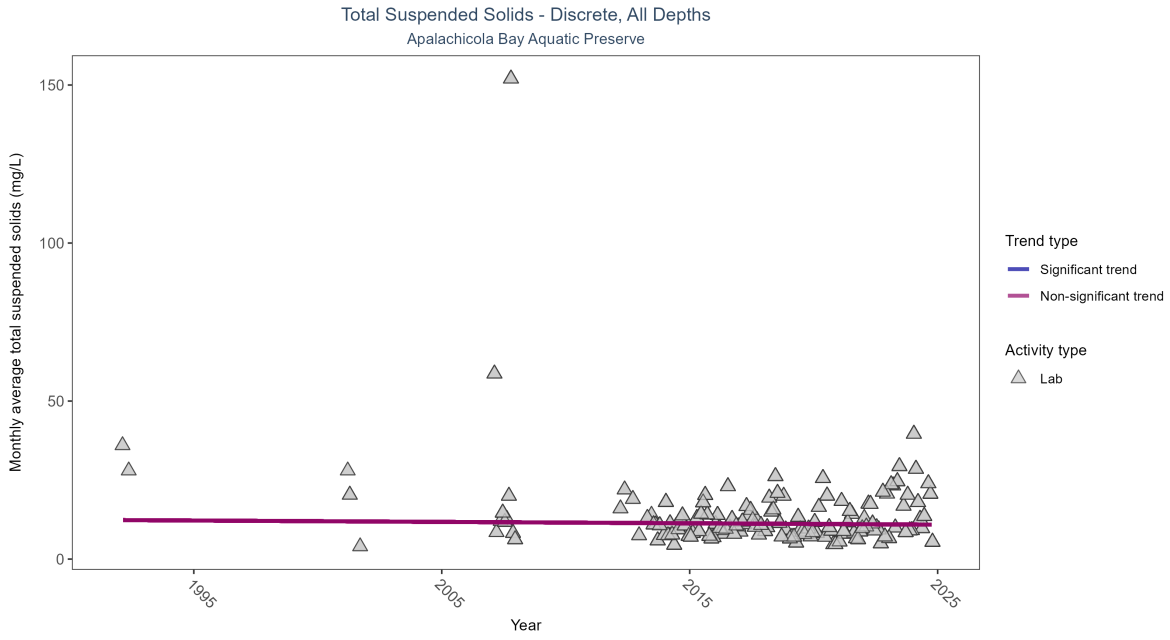

Figure 29: Scatter plot of monthly average total suspended solids (TSS) over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Only TSS values obtained from laboratory analyses (triangles) are included in the plot.

Table 15: 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	No significant trend	3102	16	1992 - 2024	9	-0.01119	12.33579	-0.04386	0.754

Total suspended solids showed no detectable trend between 1992 and 2024.

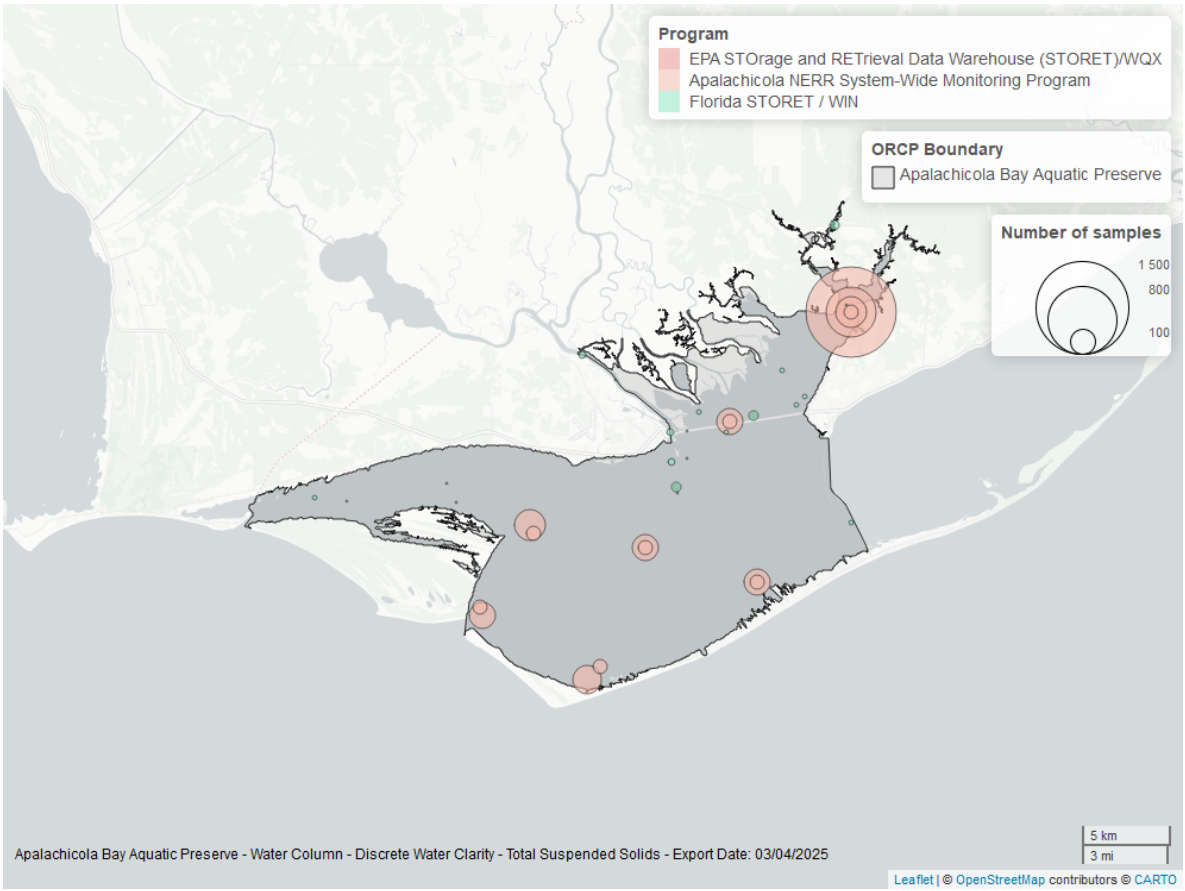

Figure 30: Map showing location of discrete water quality sampling locations within the boundaries of *Apalachicola Bay Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Chlorophyll a, Uncorrected for Pheophytin - Discrete

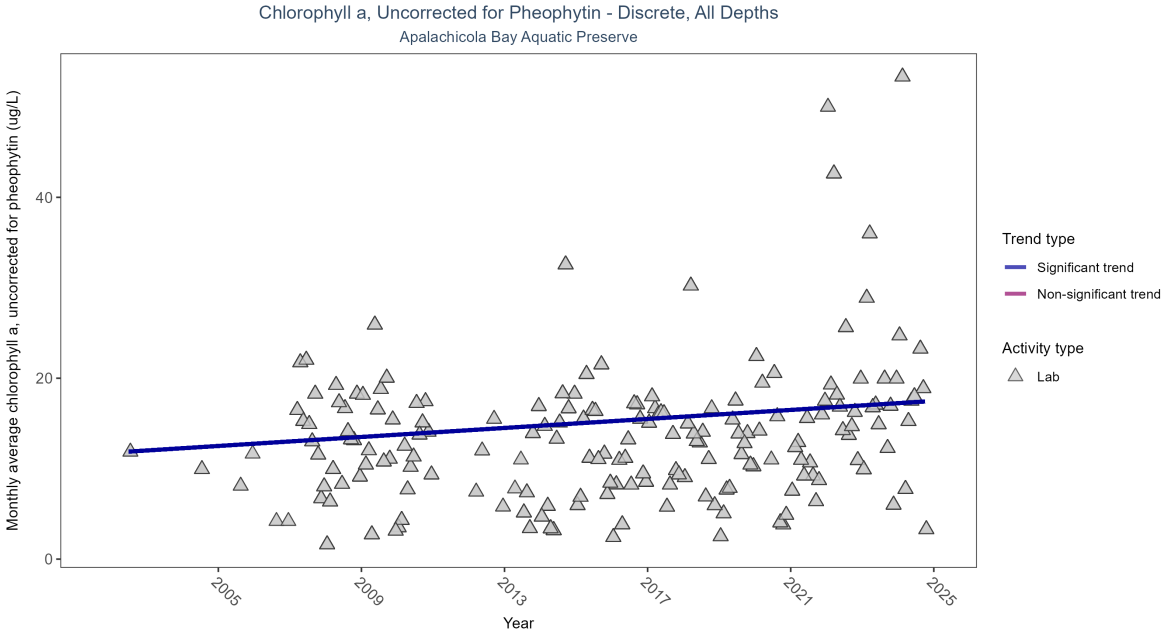

Figure 31: Scatter plot of monthly average levels of chlorophyll a, uncorrected for pheophytin, over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Only laboratory-analyzed chlorophyll a (triangles) is included in the plot.

Table 16: 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	3967	21	2002 - 2024	11.65	0.16846	11.76209	0.249	0.0027

Monthly average chlorophyll a, uncorrected for pheophytin, increased by 0.25 µg/L per year, indicating a decrease in water clarity.

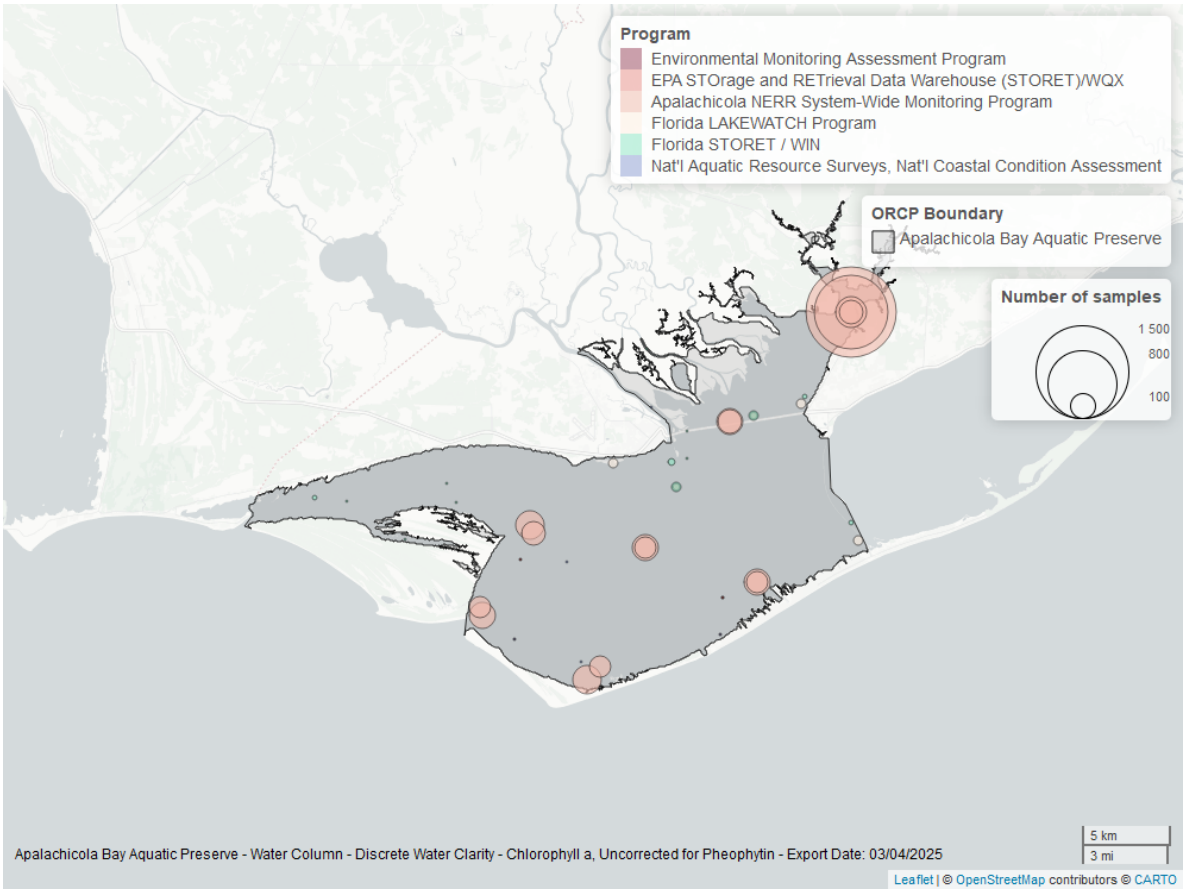

Figure 32: Map showing location of discrete water quality sampling locations within the boundaries of *Apalachicola Bay Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Chlorophyll a, Corrected for Pheophytin - Discrete

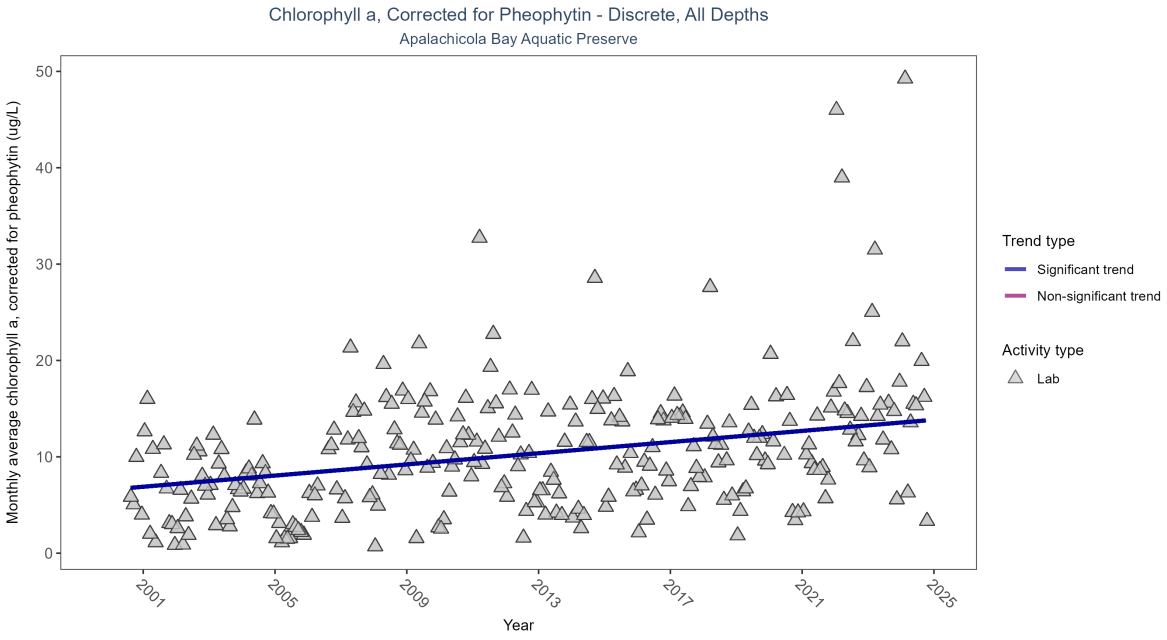

Figure 33: Scatter plot of monthly average levels of chlorophyll a, corrected for pheophytin, over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Only laboratory-analyzed chlorophyll a (triangles) is included in the plot.

Table 17: 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	Significantly increasing trend	7492	25	2000 - 2024	8.6	0.2849	6.60535	0.28968	0

Monthly average chlorophyll a, corrected for pheophytin, increased by 0.29 µg/L per year, indicating a decrease in water clarity.

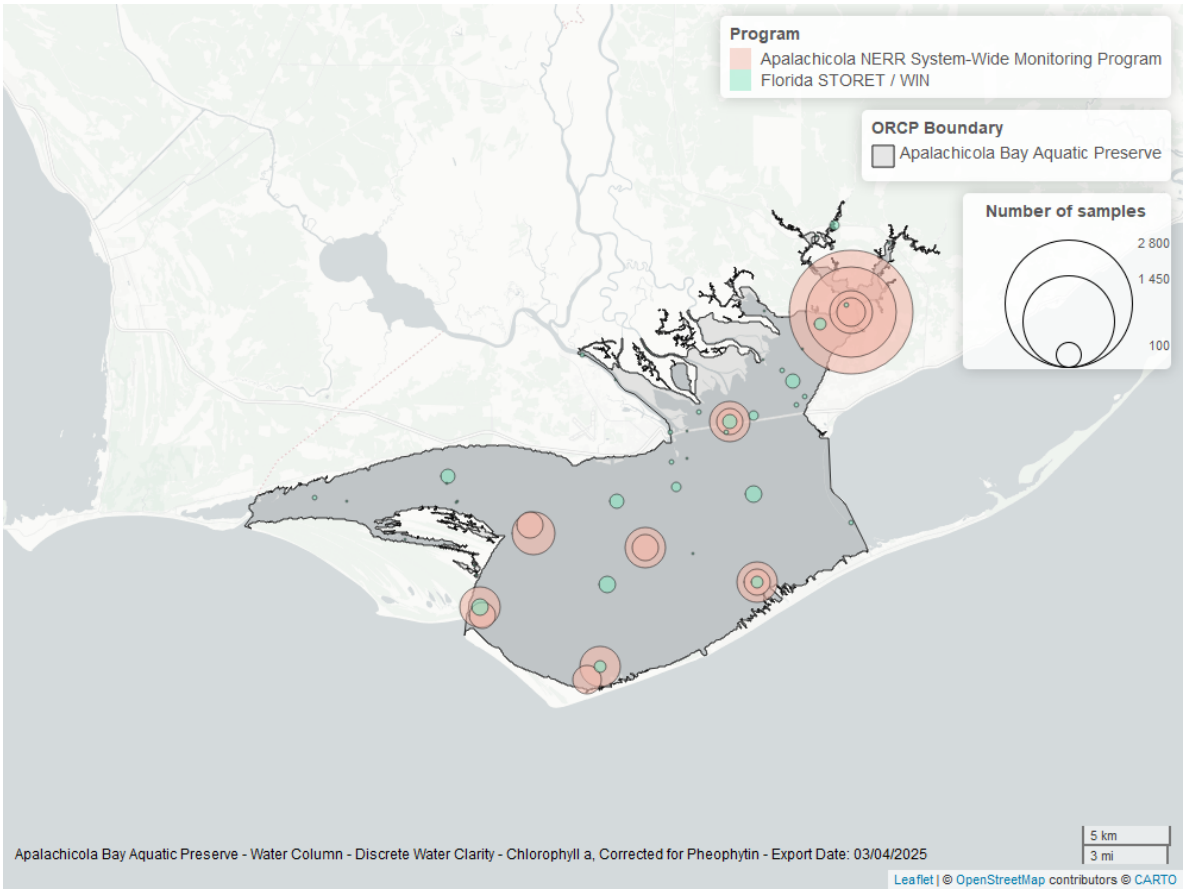

Figure 34: Map showing location of discrete water quality sampling locations within the boundaries of *Apalachicola Bay Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Secchi Depth - Discrete

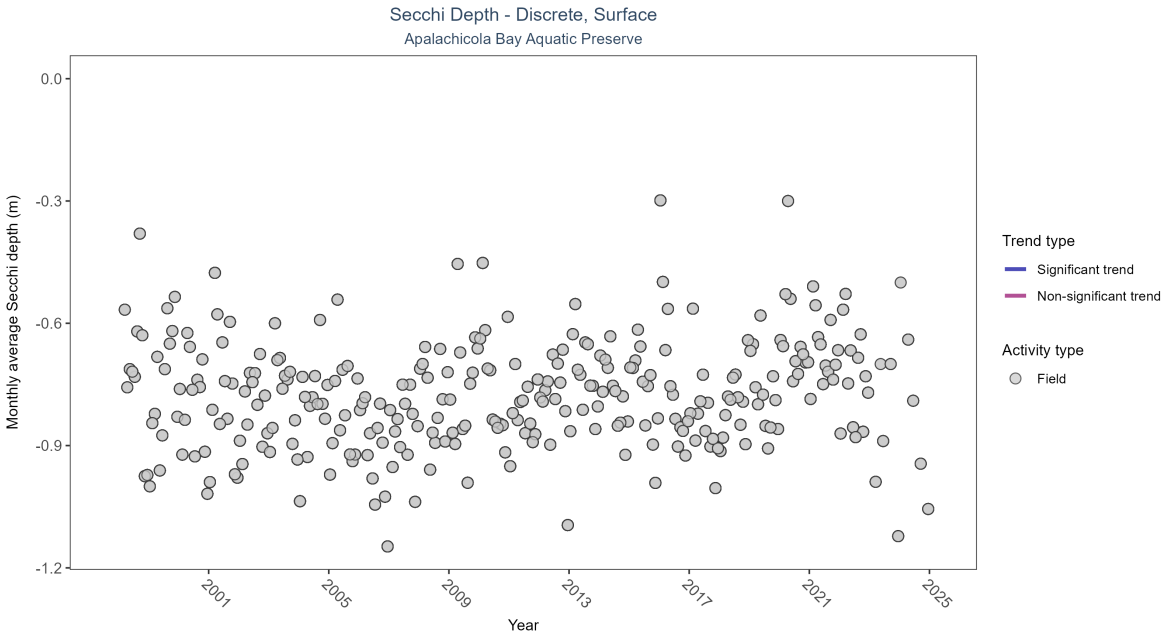

Figure 35: Scatter plot of monthly average Secchi depth over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Secchi depth is only measured in the field (circles).

Table 18: 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	27112	30	1992 - 2024	-0.8	0.10297	-0.84829	0.00266	0.0151

Monthly average Secchi depth became shallower by less than 0.01 m per year, indicating a decrease in water clarity.

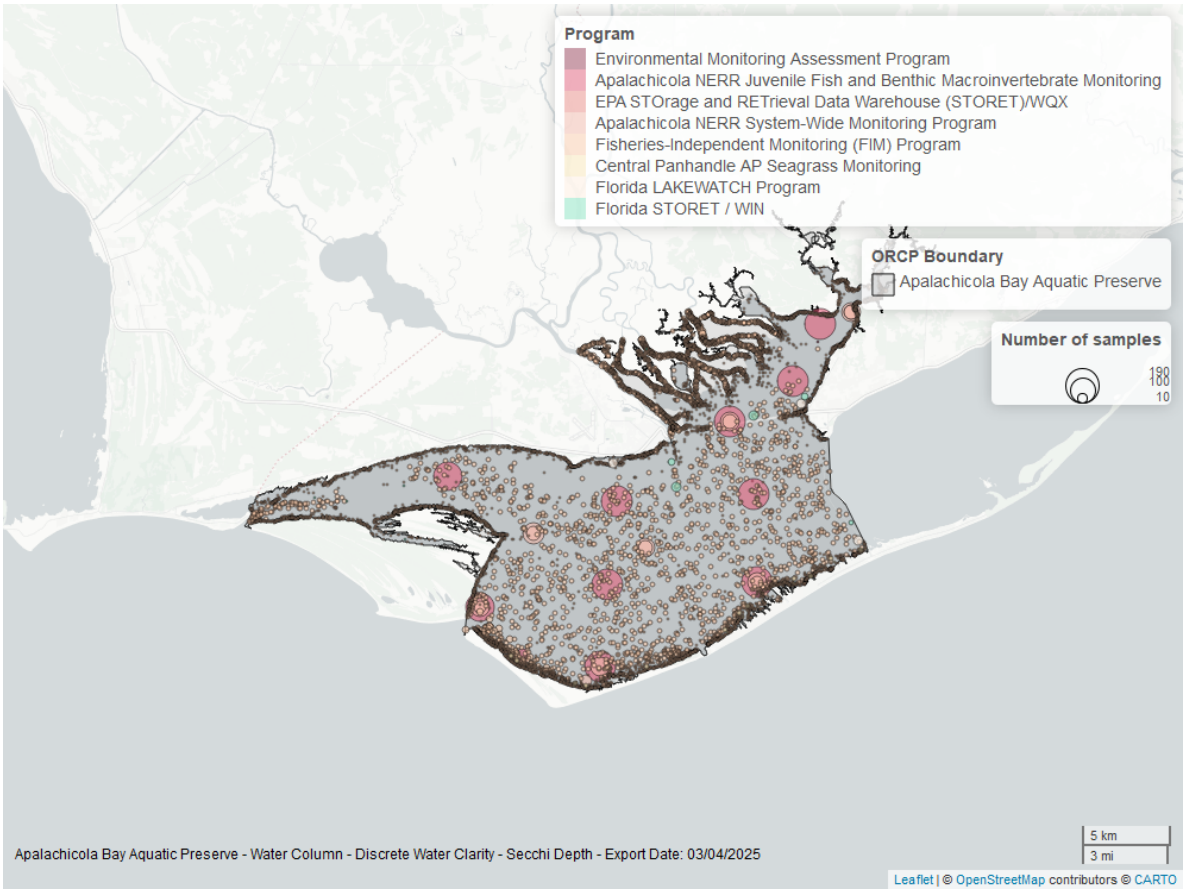

Figure 36: Map showing location of discrete water quality sampling locations within the boundaries of *Apalachicola Bay Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Colored Dissolved Organic Matter - Discrete

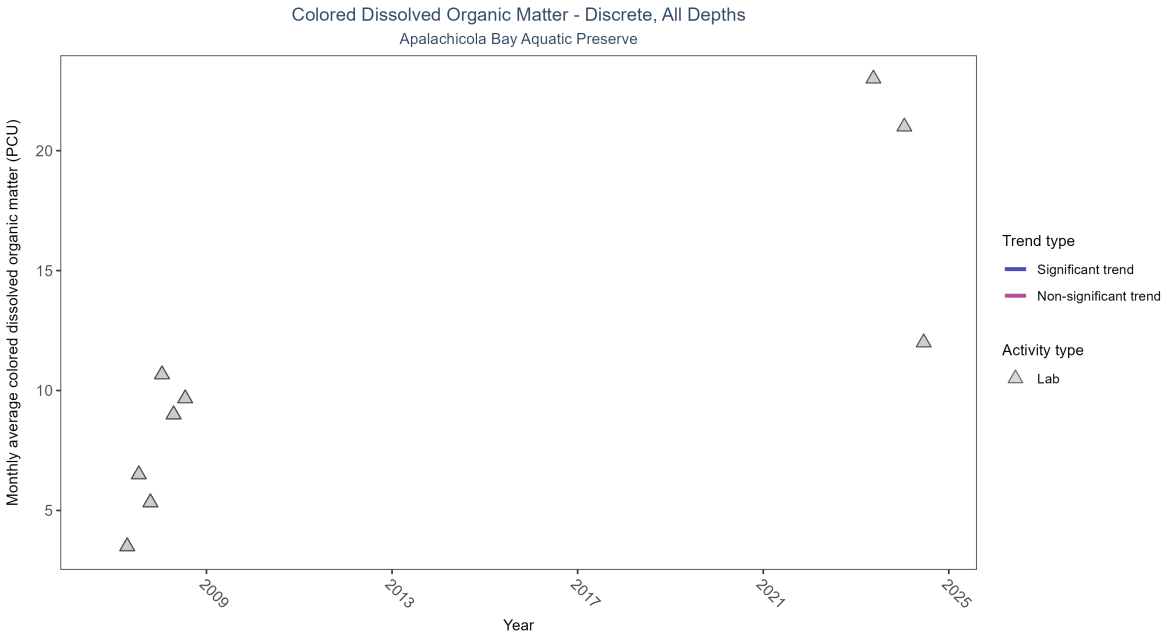

Figure 37: Scatter plot of monthly average colored dissolved organic matter (CDOM) over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Only laboratory-analyzed CDOM (triangles) is included in the plot.

Table 19: 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	Insufficient data to calculate trend	19	4	2007 - 2024	7	-	-	-	-

There was insufficient data to fit a model for colored dissolved organic matter.

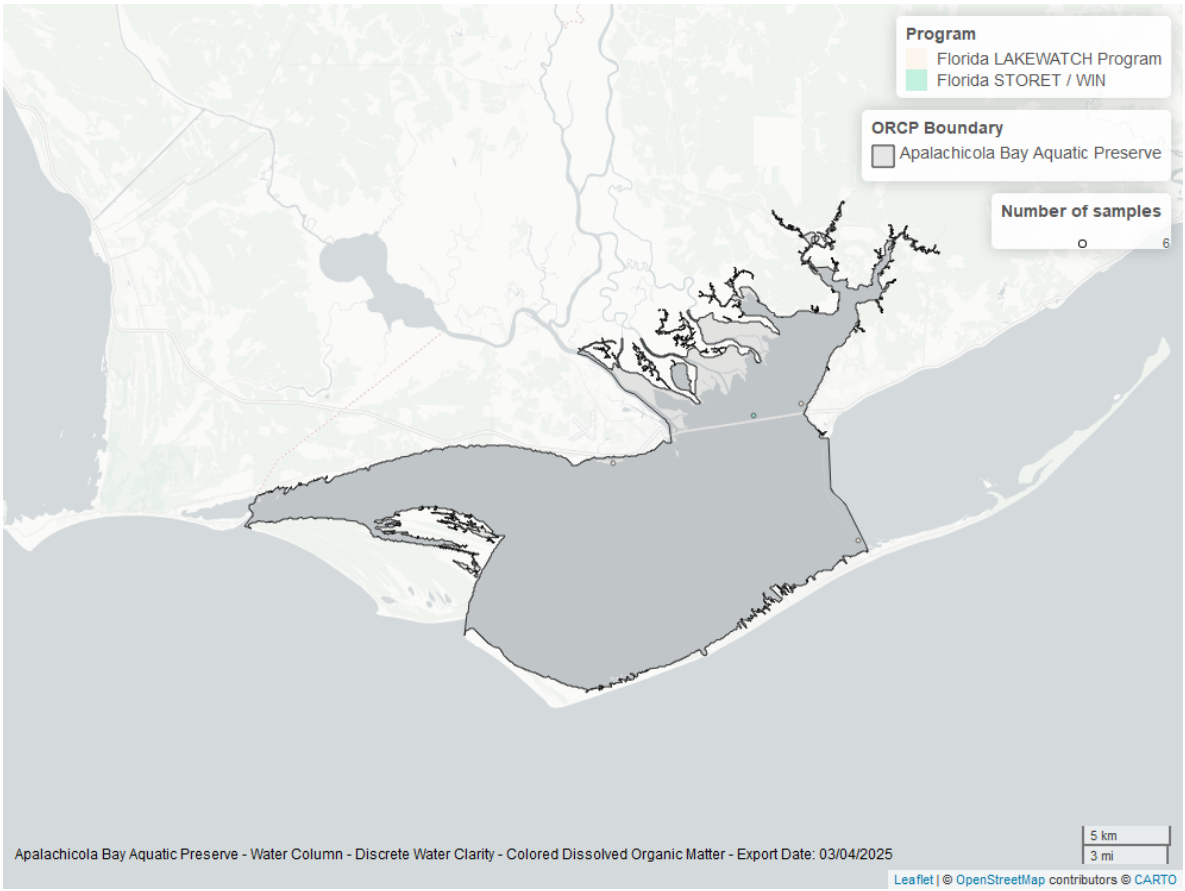

Figure 38: Map showing location of discrete water quality sampling locations within the boundaries of *Apalachicola Bay Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.