

Alligator Harbor Aquatic Preserve

SEACAR Water Quality Analysis

Last compiled on 10 July, 2025

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Indicators

Nutrients

Total Nitrogen - Discrete

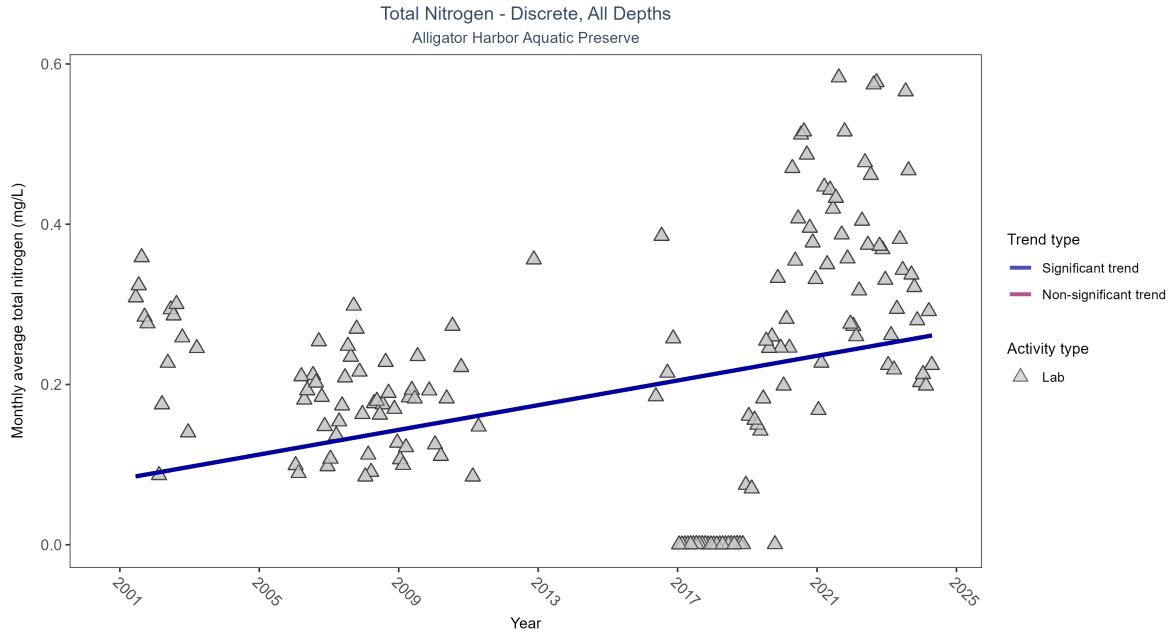


Figure 1: Scatter plot of monthly average total nitrogen over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Only nitrogen values obtained from laboratory analyses (triangles) are included in the 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	1585	19	2001 - 2024	0.19	0.28129	0.08179	0.0077	0

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

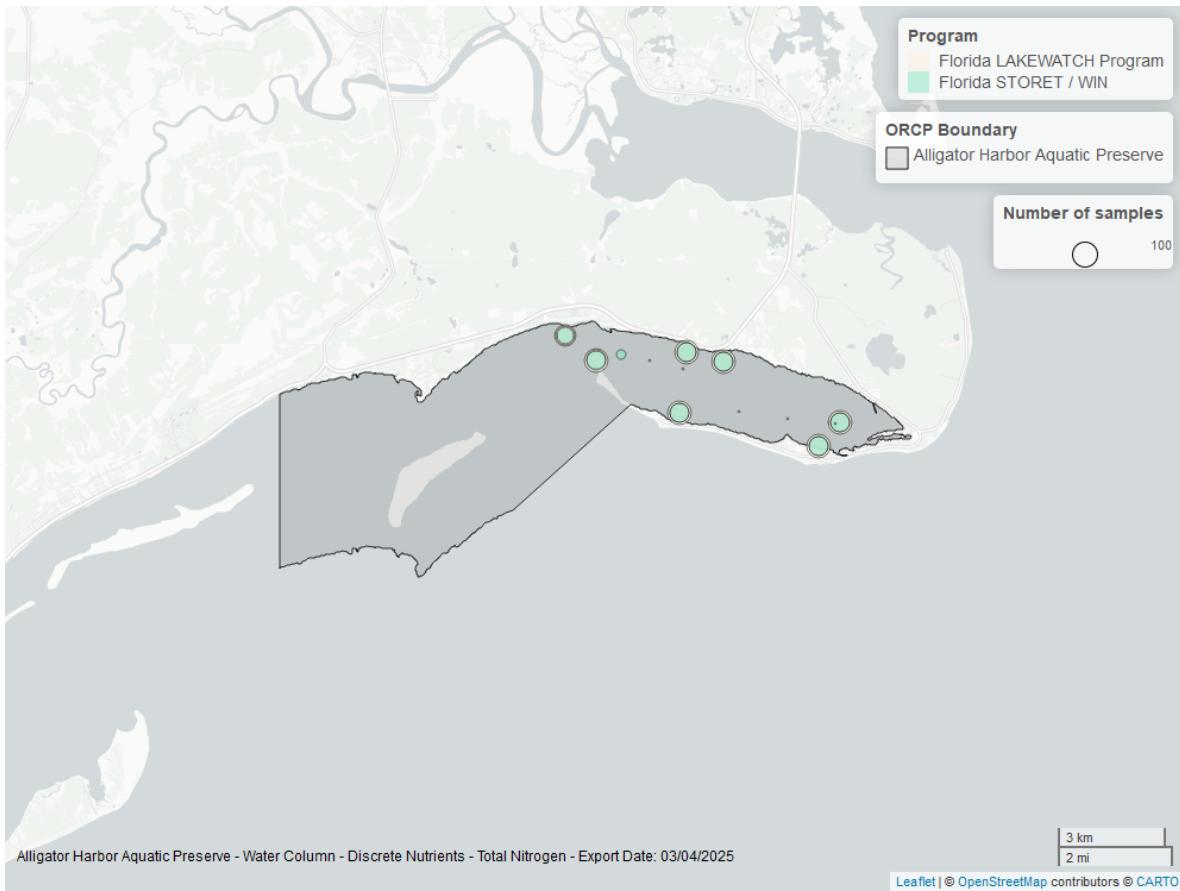


Figure 2: Map showing location of discrete water quality sampling locations within the boundaries of *Alligator Harbor Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Total Phosphorus - Discrete

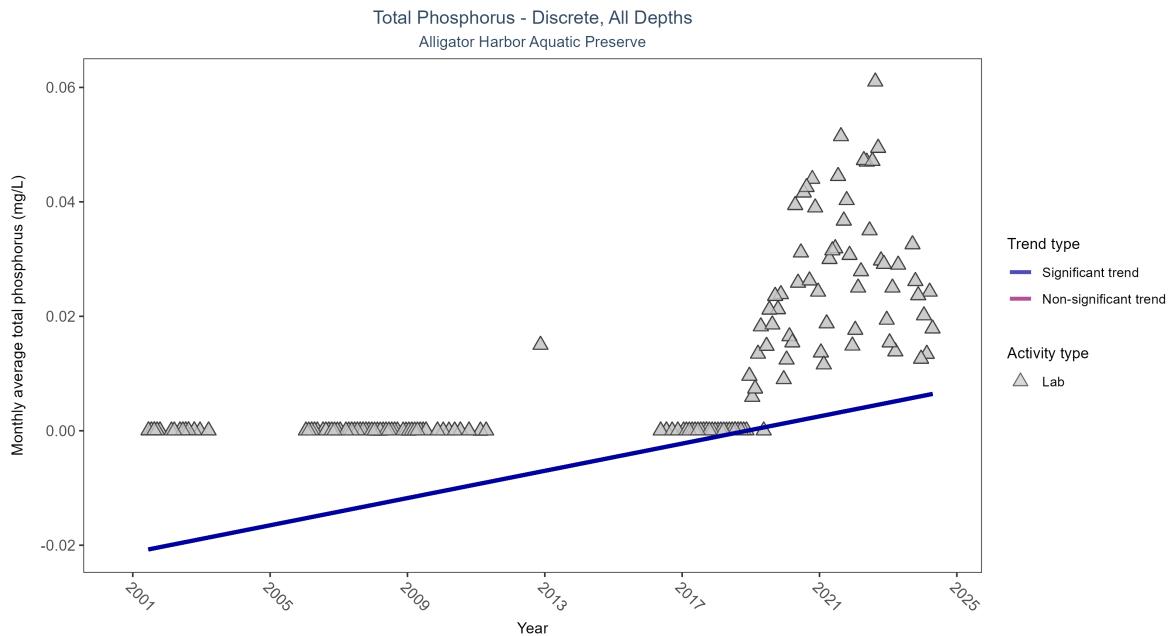


Figure 3: Scatter plot of monthly average total phosphorus over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Only phosphorus values obtained from laboratory analyses (triangles) are included in 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	Significantly increasing trend	1149	19	2001 - 2024	0.00005	0.56772	-0.02128	0.00119	0

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

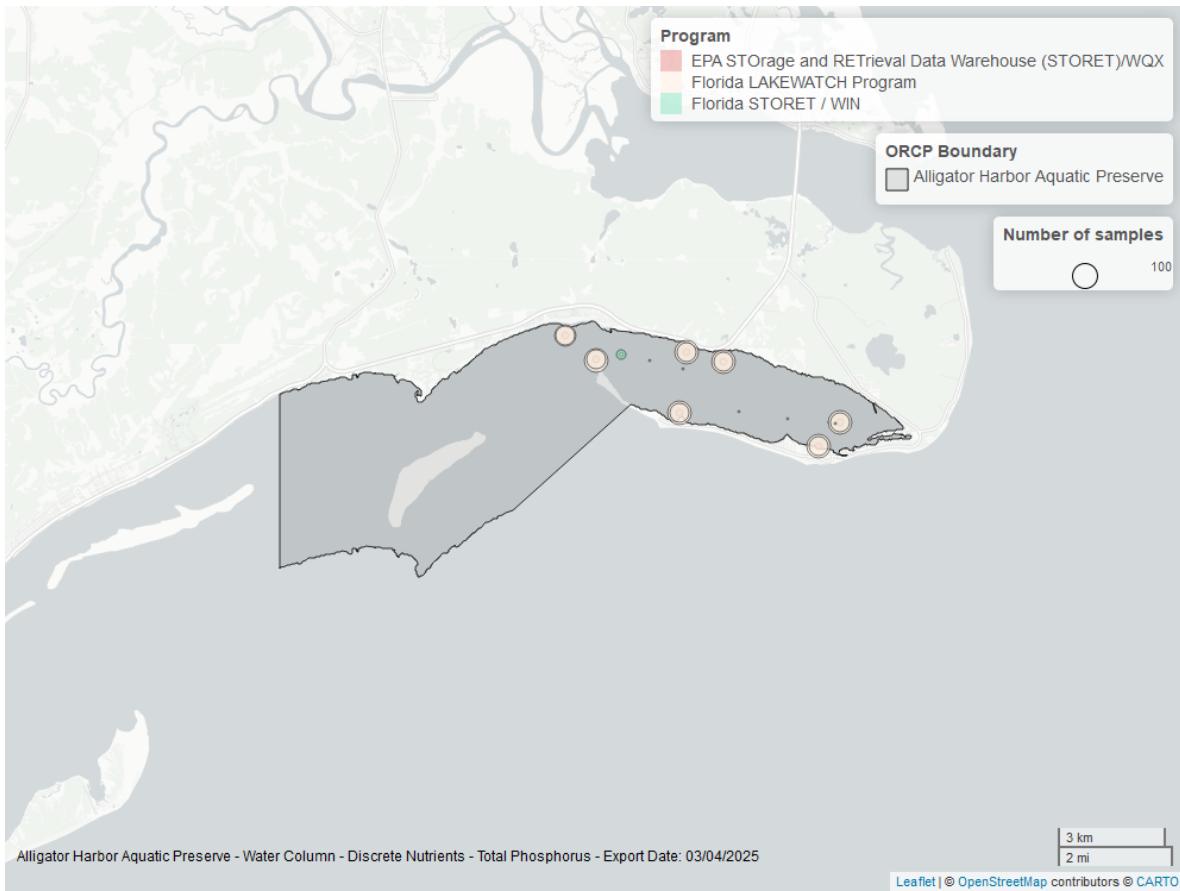


Figure 4: Map showing location of discrete water quality sampling locations within the boundaries of *Alligator Harbor Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Water Quality

Dissolved Oxygen - Discrete

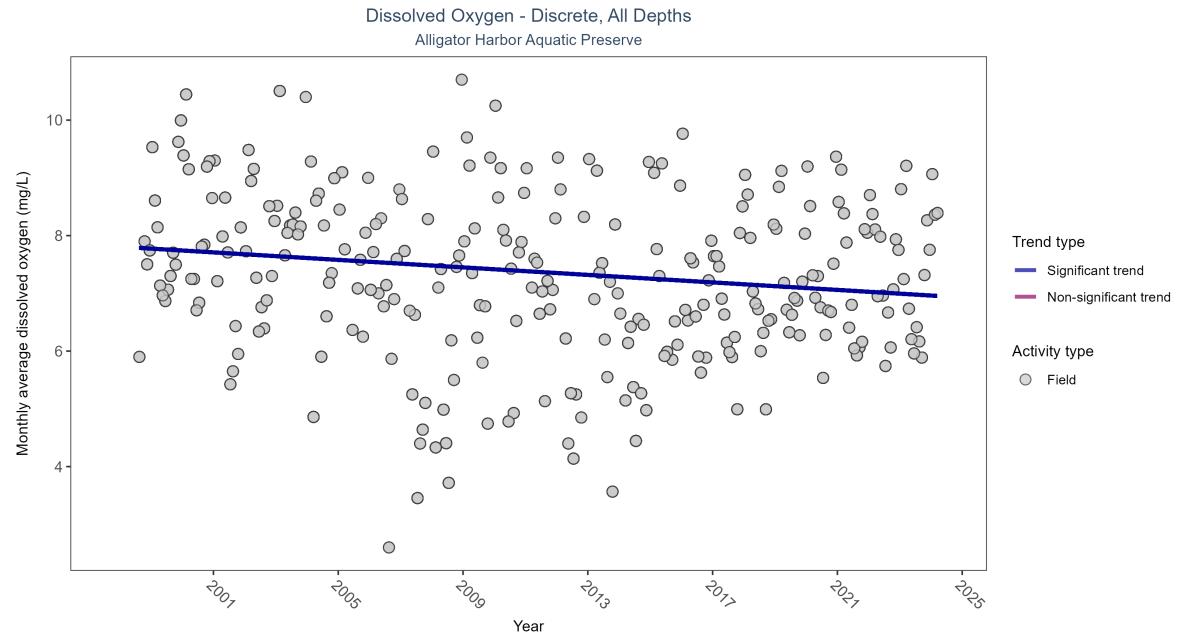


Figure 5: Scatter plot of monthly average dissolved oxygen over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Only dissolved oxygen values measured in the field (circles) are included in the plot.

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	8140	27	1998 - 2024		7.2	-0.16645	7.8071	-0.0325 0.0001

Monthly average dissolved oxygen decreased by 0.03 mg/L per year.

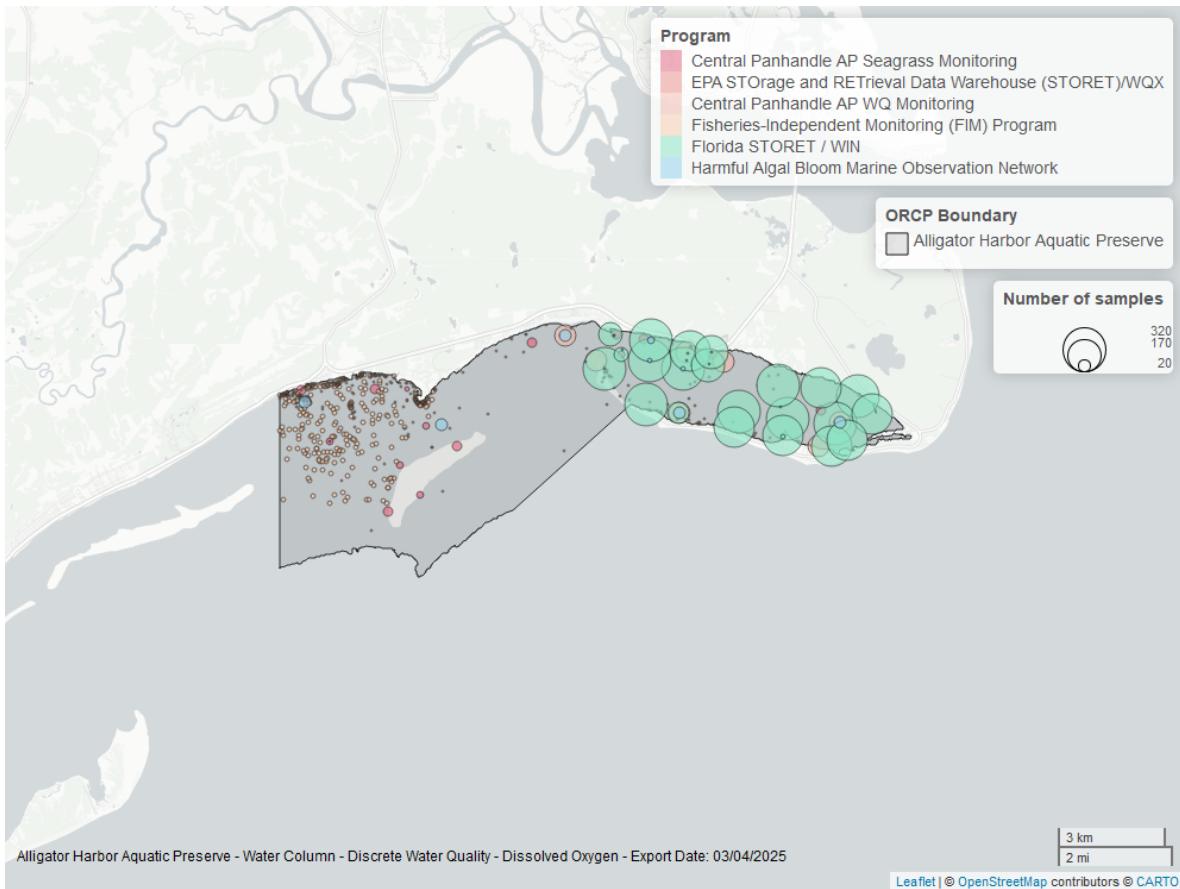


Figure 6: Map showing location of discrete water quality sampling locations within the boundaries of *Alligator Harbor Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Dissolved Oxygen - Continuous

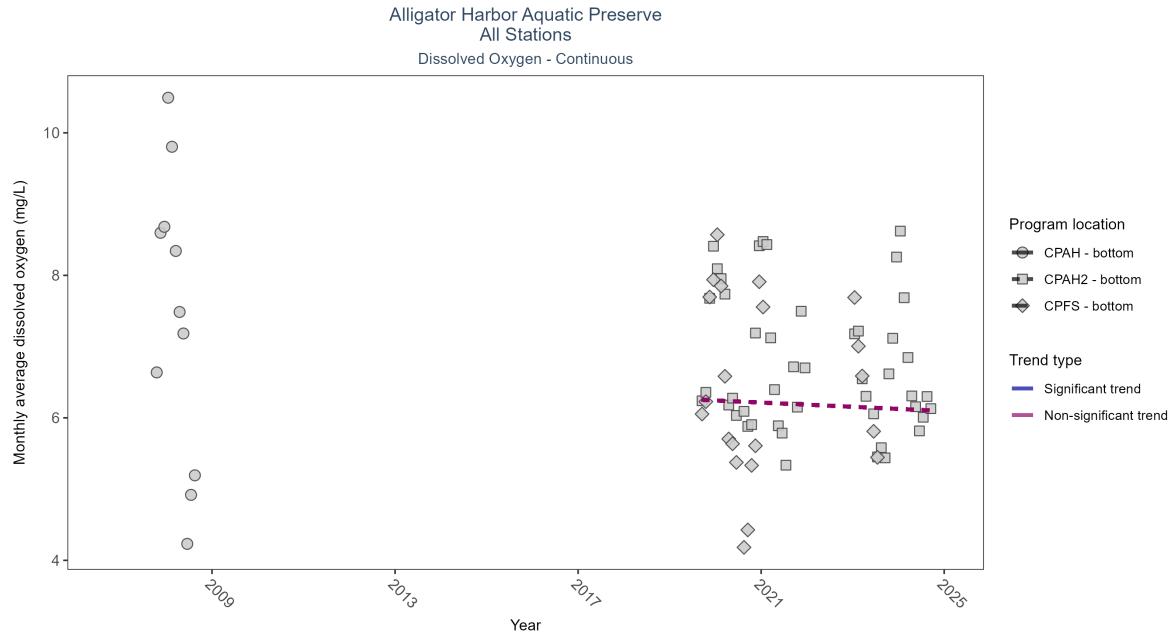


Figure 7: Scatter plot of monthly average dissolved oxygen over time at continuously monitored program locations. Each location is analyzed separately, with significant (blue) or non-significant (magenta) trend lines shown for time series that included five or more years of observations.

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
CPFS	Insufficient data to calculate trend	39993	4	2019 - 2023	6.4	-	-	-	-
CPAH2	No significant trend	106054	5	2019 - 2024	6.9	-0.04	6.27	-0.03	0.6846
CPAH	Insufficient data to calculate trend	11557	2	2007 - 2008	8.0	-	-	-	-

No detectable change in monthly average dissolved oxygen was observed at one location. There was insufficient data to fit a model for two locations.

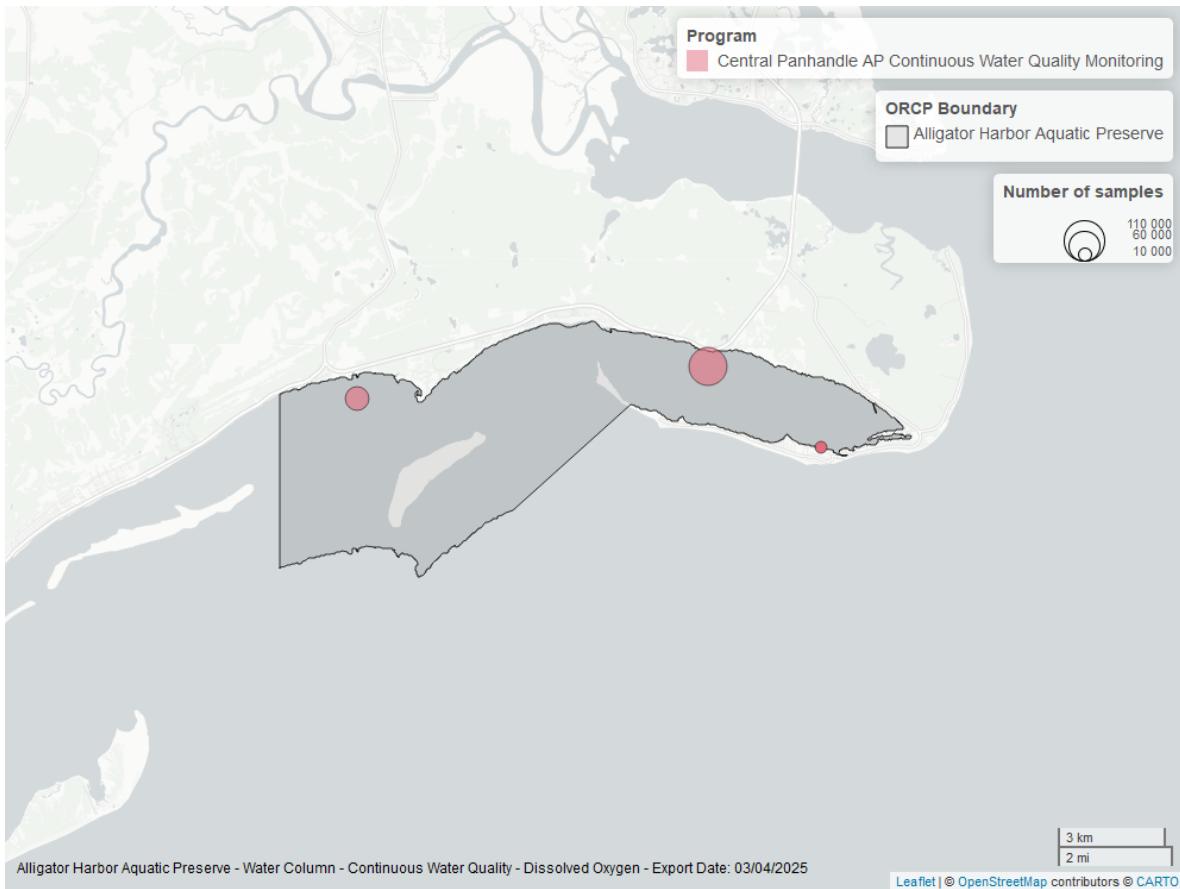


Figure 8: Map showing location of dissolved oxygen continuous water quality sampling locations within the boundaries of *Alligator Harbor Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Dissolved Oxygen Saturation - Discrete

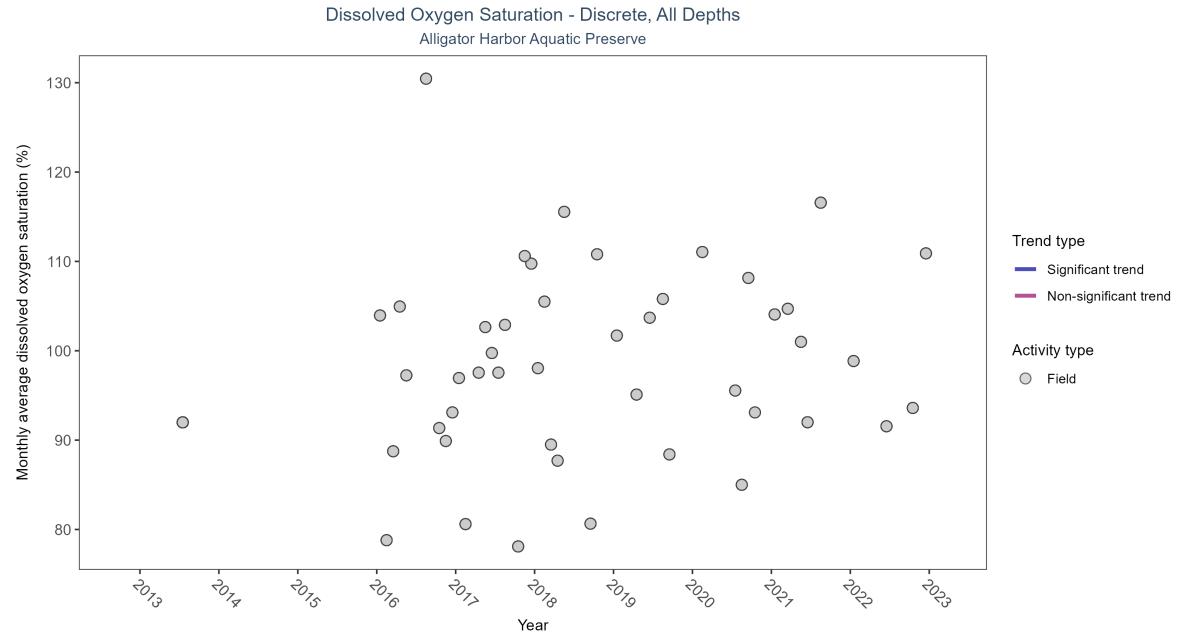


Figure 9: Scatter plot of monthly average dissolved oxygen saturation over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Only dissolved oxygen saturation values measured in the field (circles) 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	Insufficient data to calculate trend	131	8	2013 - 2022	96.8	-	-	-	-

There was insufficient data to fit a model for dissolved oxygen saturation.

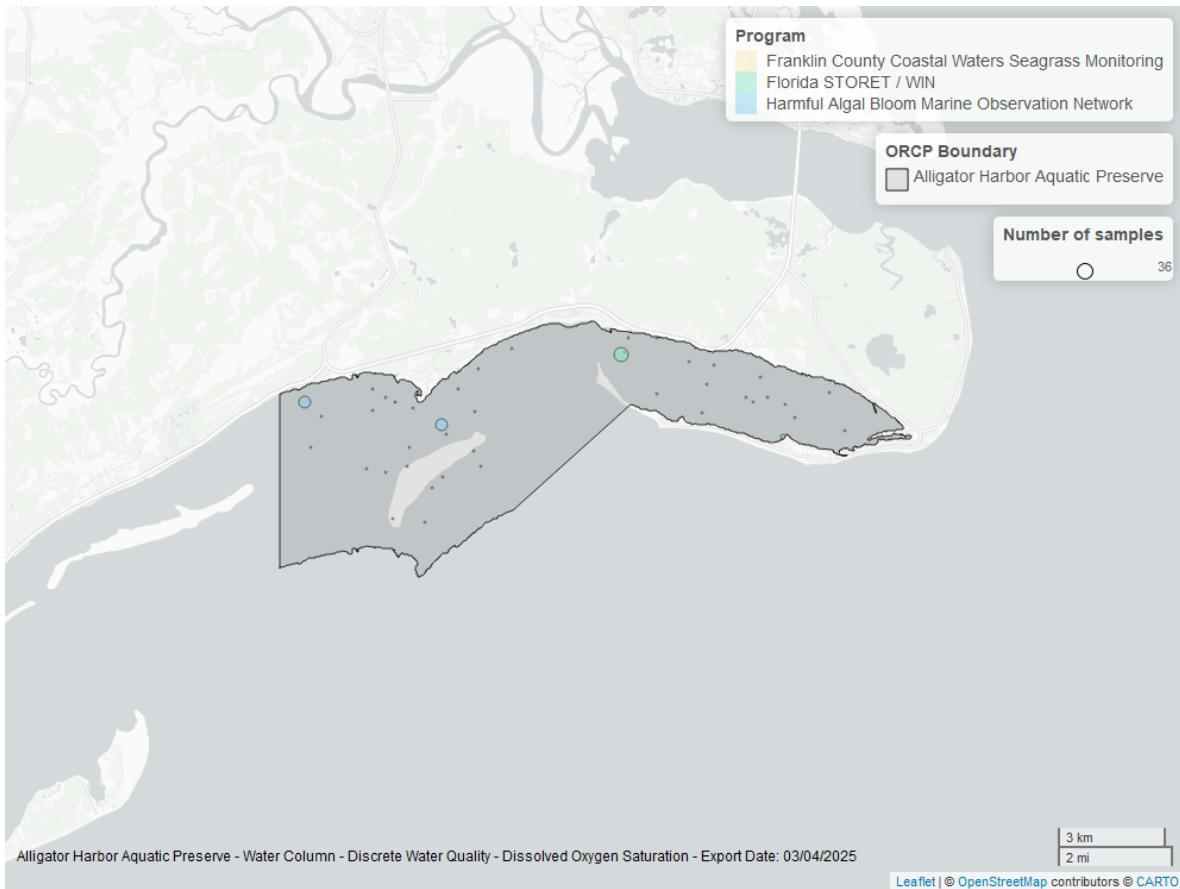


Figure 10: Map showing location of discrete water quality sampling locations within the boundaries of *Alligator Harbor Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Dissolved Oxygen Saturation - Continuous

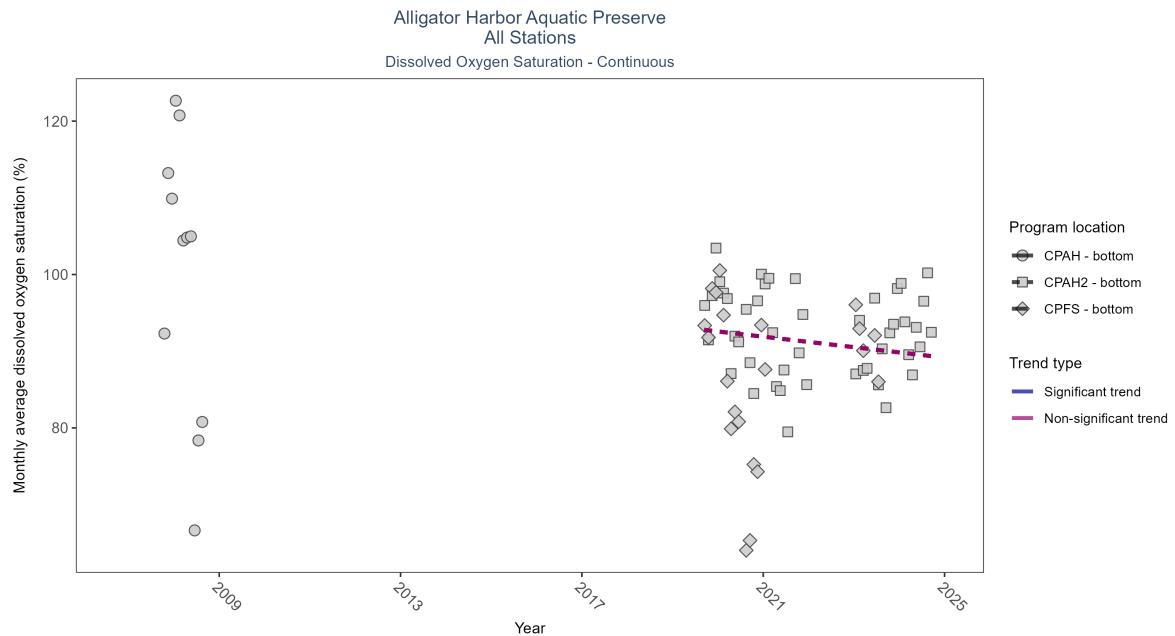


Figure 11: Scatter plot of monthly average dissolved oxygen saturation over time at continuously monitored program locations. Each location is analyzed separately, with significant (blue) or non-significant (magenta) trend lines shown for time series that included five or more years of observations.

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
CPFS	Insufficient data to calculate trend	39993	4	2019 - 2023	90.4	-	-	-	-
CPAH2	No significant trend	106054	5	2019 - 2024	94.0	-0.17	93.26	-0.68	0.1552
CPAH	Insufficient data to calculate trend	11557	2	2007 - 2008	105.6	-	-	-	-

No detectable change in monthly average dissolved oxygen saturation was observed at one location. There was insufficient data to fit a model for two locations.

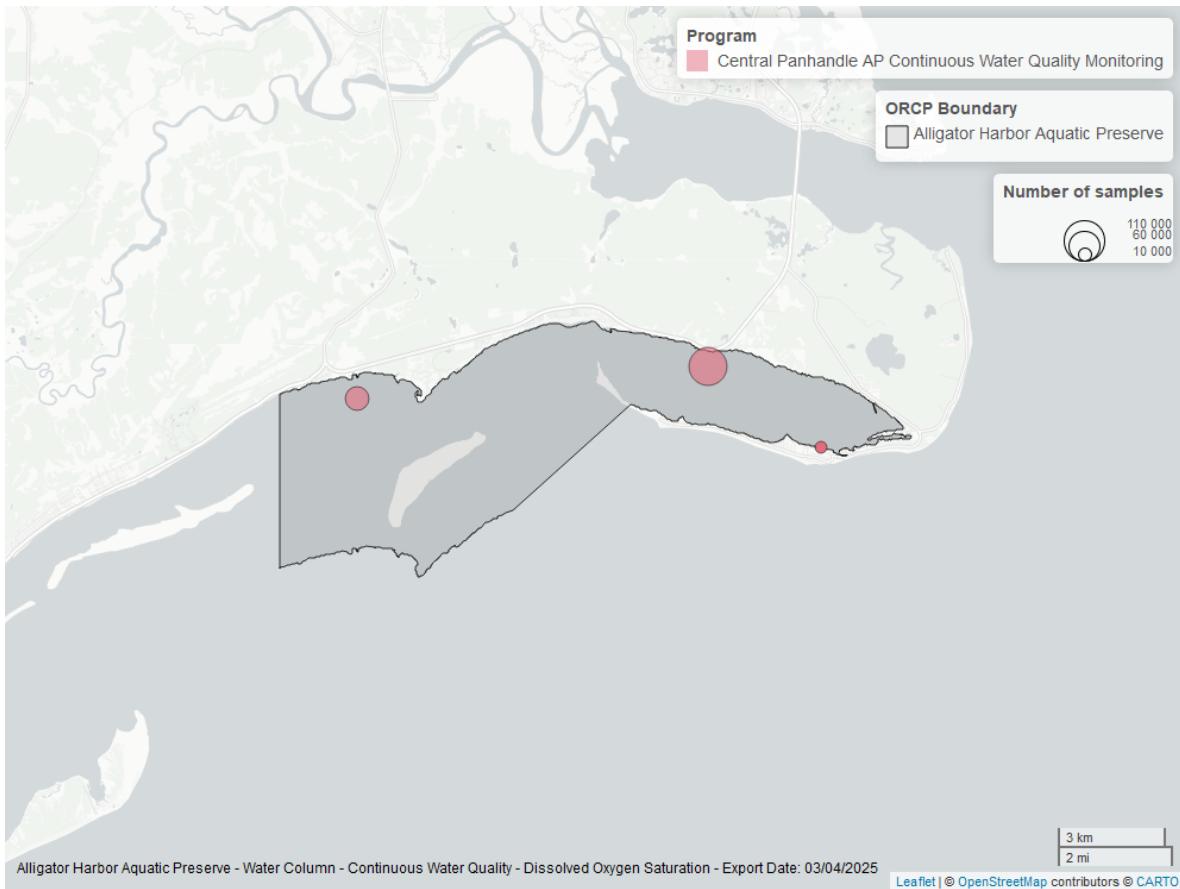


Figure 12: Map showing location of dissolved oxygen saturation continuous water quality sampling locations within the boundaries of *Alligator Harbor Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Salinity - Discrete

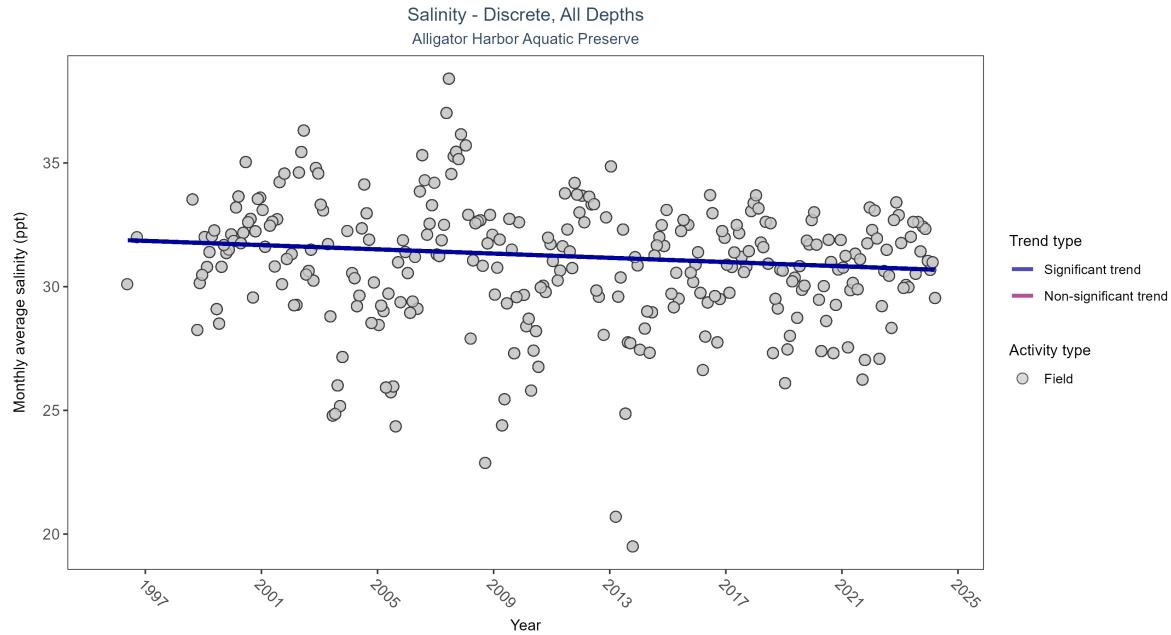


Figure 13: Scatter plot of monthly average salinity over time. If the time series included ten or more years of discrete observations, significant (blue) or non-significant (magenta) trend lines are also shown. Discrete salinity values derived from grab samples analyzed in the field (circles) or the 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	9377	28	1996 - 2024	31.2	-0.10569	31.89388	-0.04281	0.011

Monthly average salinity decreased by 0.04 ppt per year.

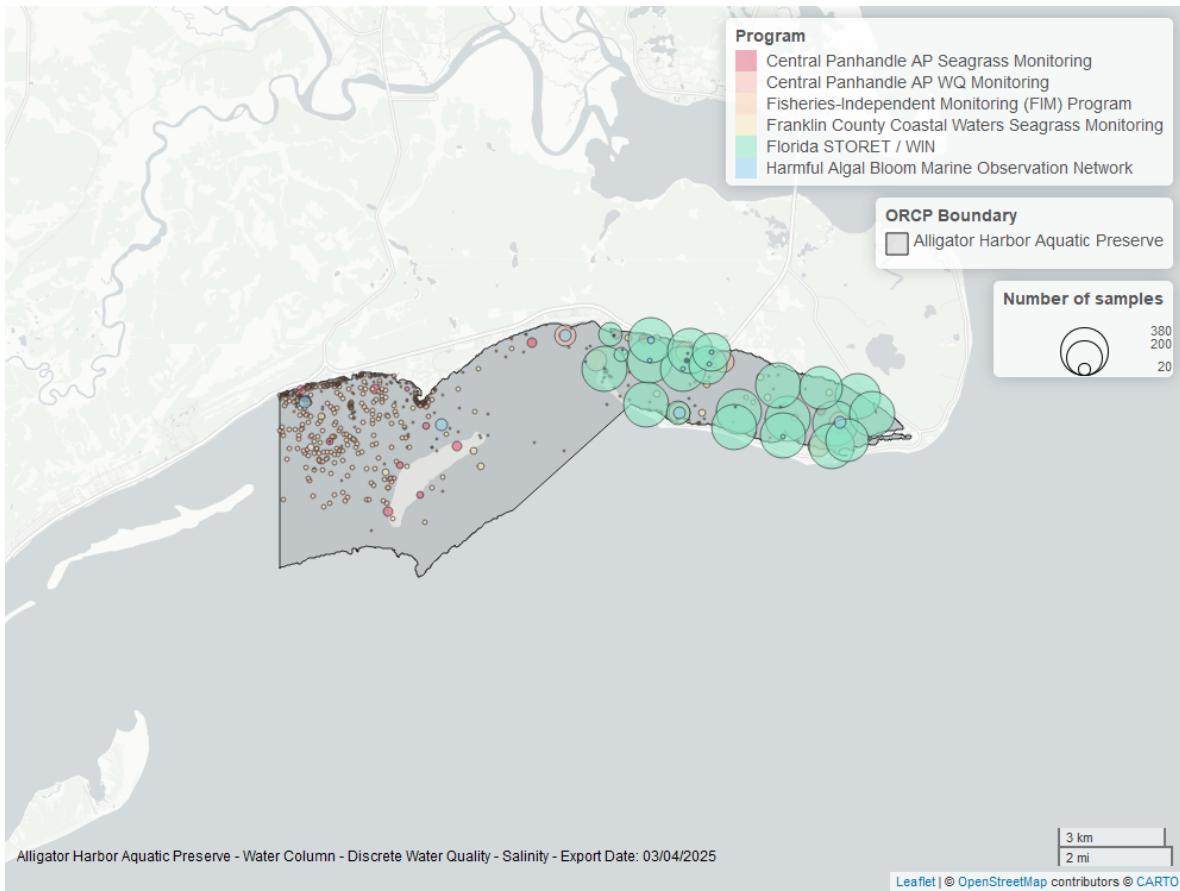


Figure 14: Map showing location of discrete water quality sampling locations within the boundaries of *Alligator Harbor Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Salinity - Continuous

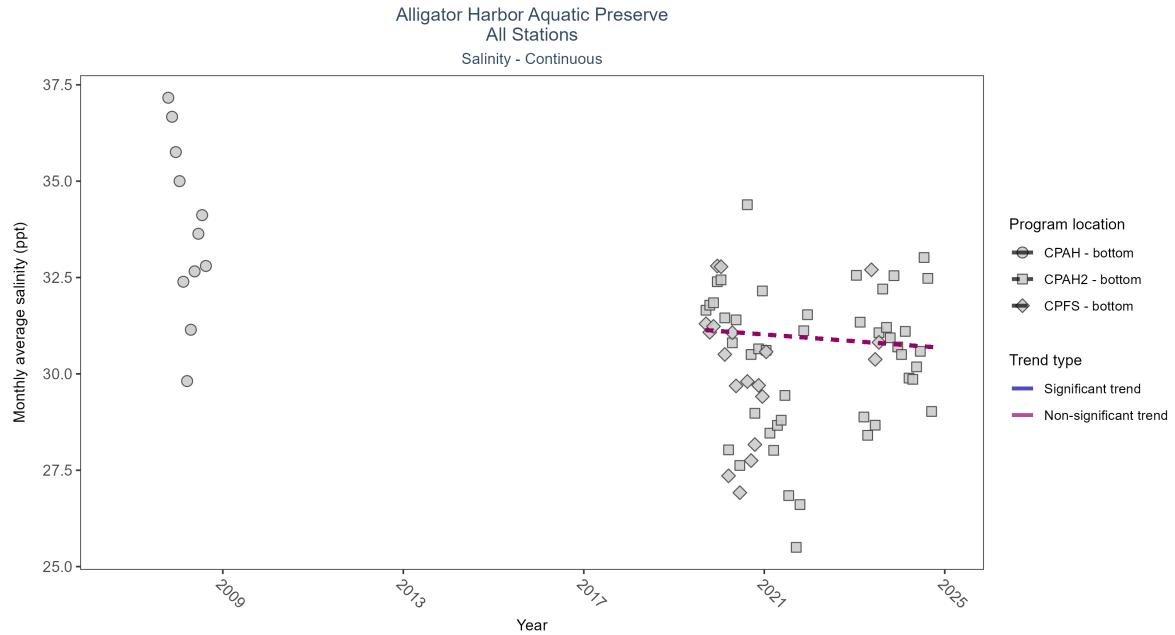


Figure 15: Scatter plot of monthly average salinity over time at continuously monitored program locations. Each location is analyzed separately, with significant (blue) or non-significant (magenta) trend lines shown for time series that included five or more years of observations.

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
CPFS	Insufficient data to calculate trend	38401	4	2019 - 2023	30.7	-	-	-	-
CPAH2	No significant trend	102479	5	2019 - 2024	30.7	-0.08	31.2	-0.09	0.5424
CPAH	Insufficient data to calculate trend	13034	2	2007 - 2008	34.0	-	-	-	-

No detectable change in monthly average salinity was observed at one location. There was insufficient data to fit a model for two locations.

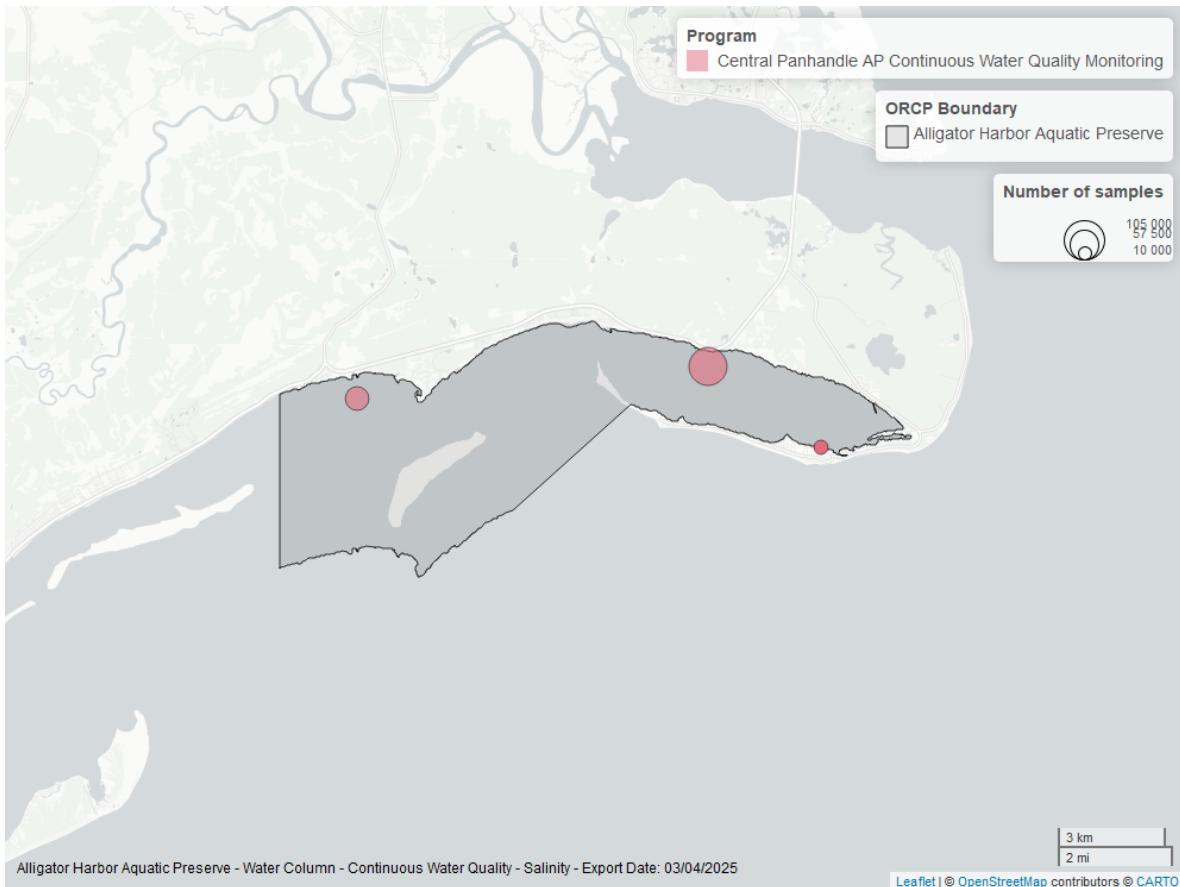


Figure 16: Map showing location of salinity continuous water quality sampling locations within the boundaries of *Alligator Harbor Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Water Temperature - Discrete

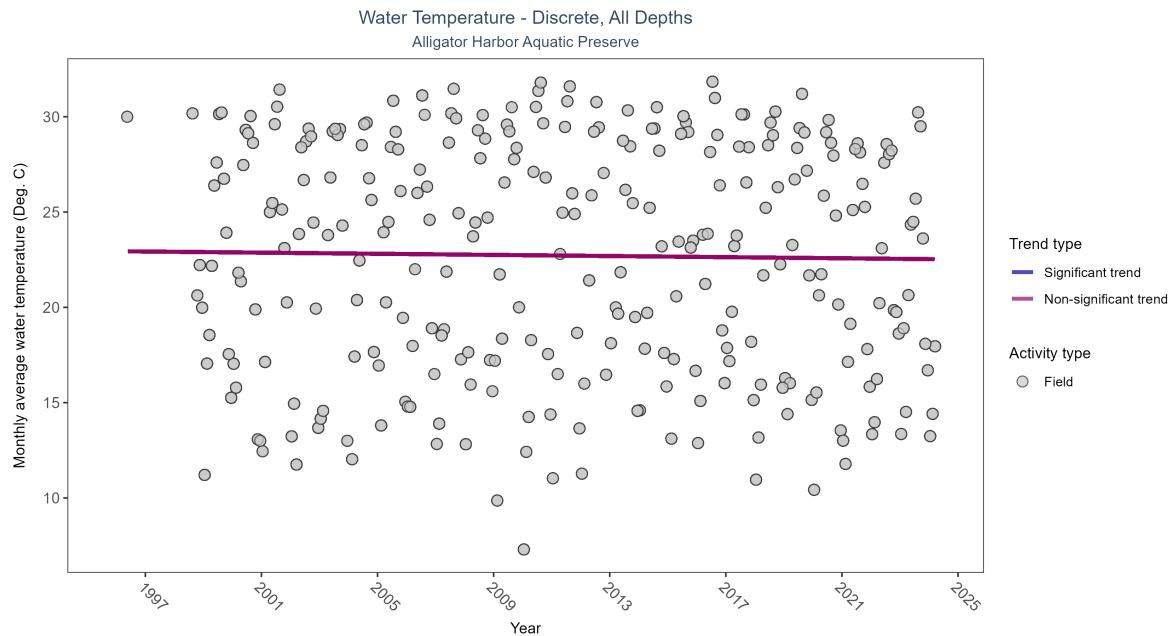


Figure 17: Scatter plot of monthly average water temperature over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Only water temperature measurements taken in the field (circles) are included in 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	No significant trend	9633	28	1996 - 2024	25.8	-0.04668	22.94377	-0.01477	0.2321

Water temperature showed no detectable trend between 1996 and 2024.

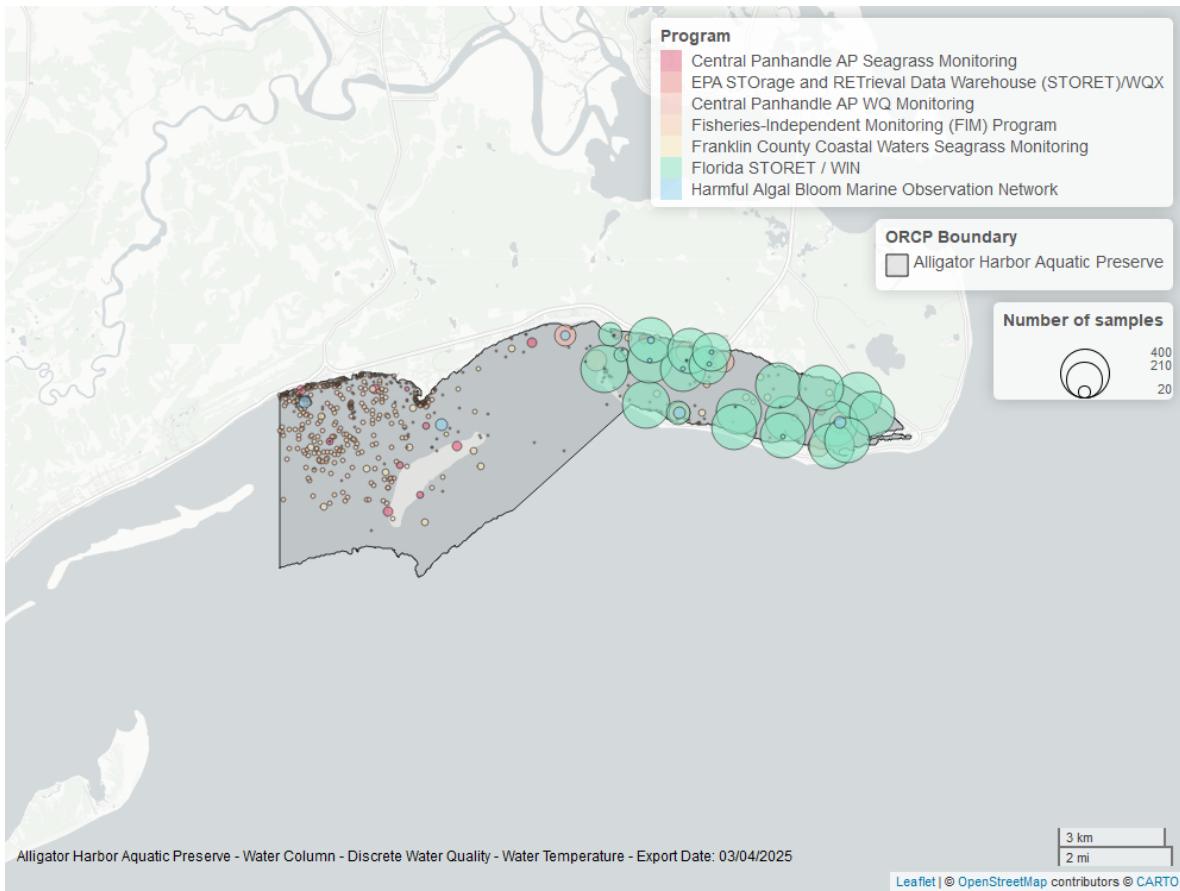


Figure 18: Map showing location of discrete water quality sampling locations within the boundaries of *Alligator Harbor Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Water Temperature - Continuous

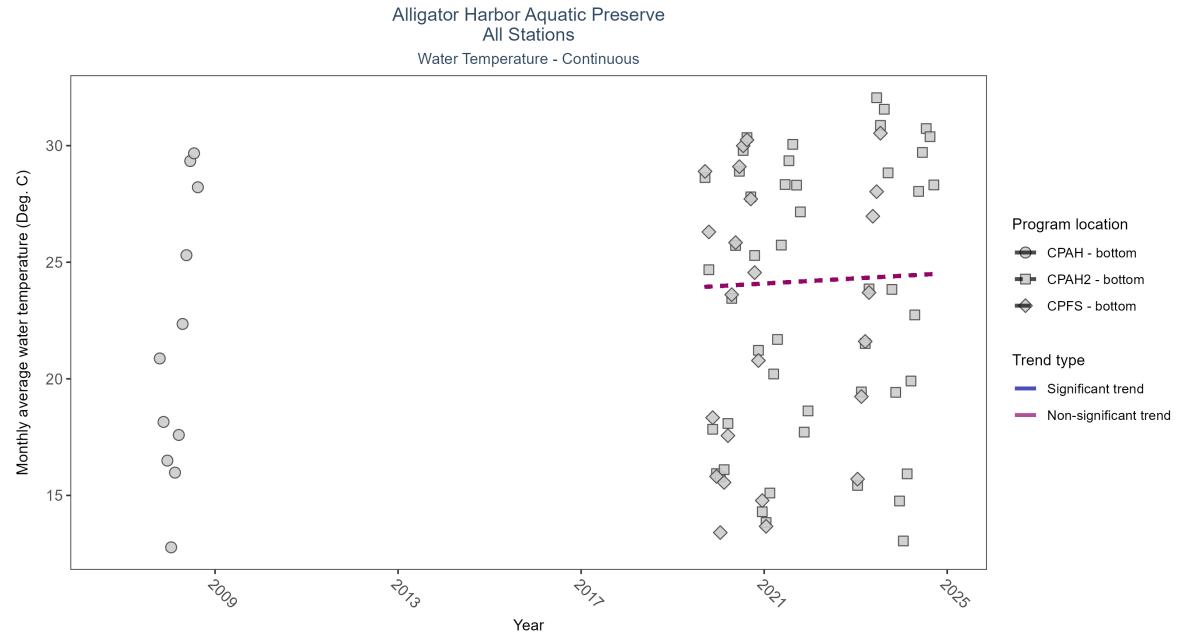


Figure 19: Scatter plot of monthly average water temperature over time at continuously monitored program locations. Each location is analyzed separately, with significant (blue) or non-significant (magenta) trend lines shown for time series that included five or more years of observations.

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
CPFS	Insufficient data to calculate trend	53708	4	2019 - 2023	24.2	-	-	-	-
CPAH2	No significant trend	118901	5	2019 - 2024	23.5	0.14	23.87	0.11	0.4393
CPAH	Insufficient data to calculate trend	13034	2	2007 - 2008	20.9	-	-	-	-

No detectable change in monthly average water temperature was observed at one location. There was insufficient data to fit a model for two locations.

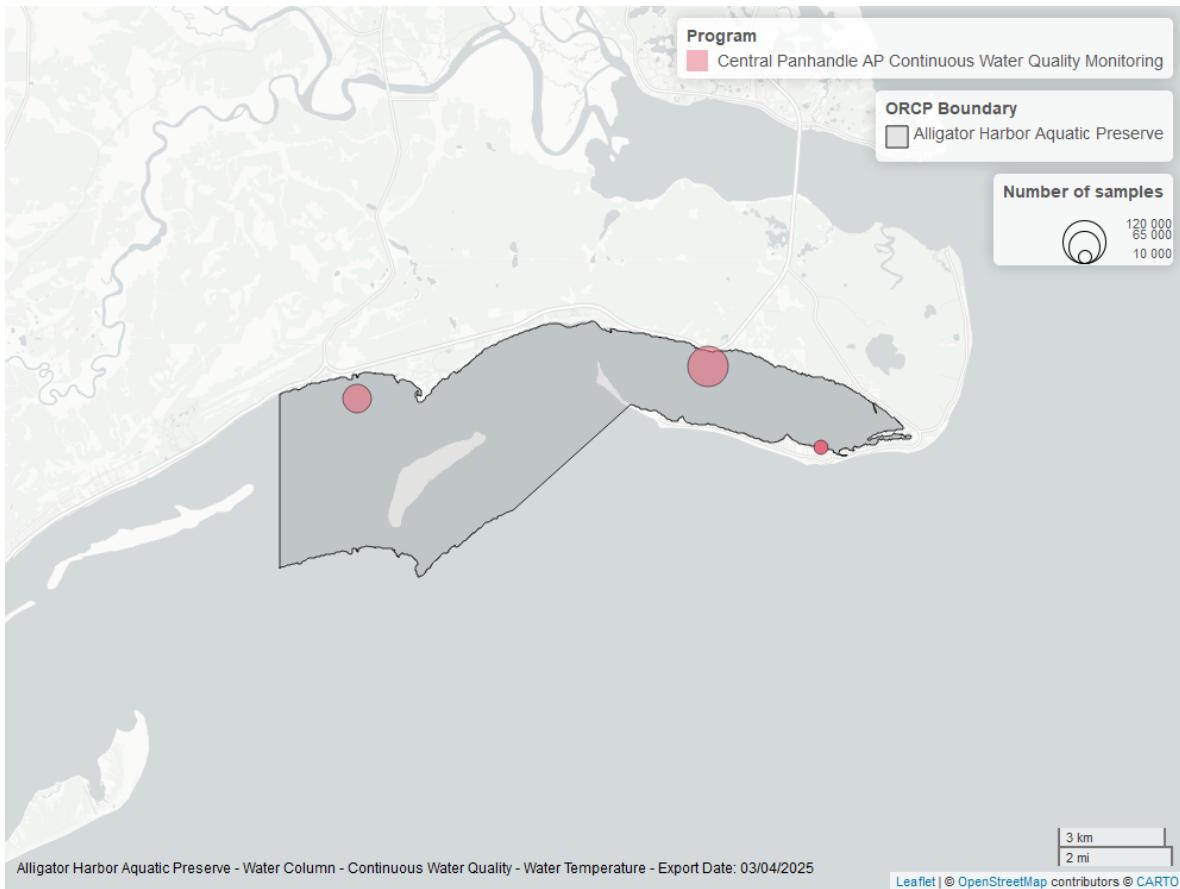


Figure 20: Map showing location of water temperature continuous water quality sampling locations within the boundaries of *Alligator Harbor Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

pH - Discrete

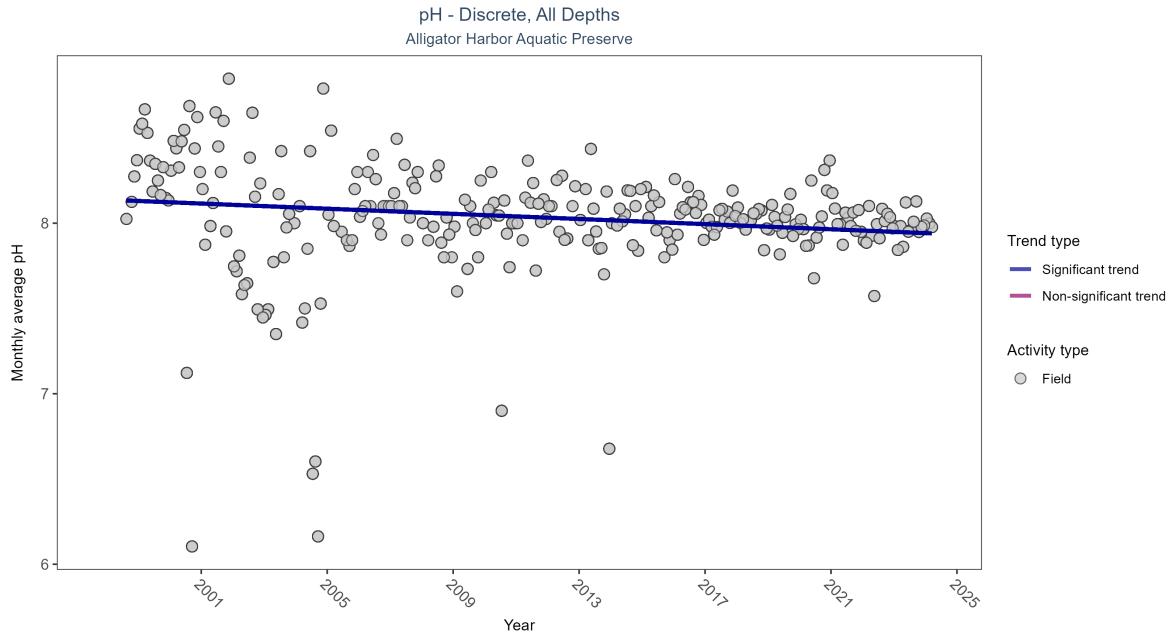


Figure 21: Scatter plot of monthly average pH over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Only pH values measured in the field (circles) are included in the plot.

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	5266	27	1998 - 2024	8.1	-0.18549	8.13778	-0.00754	0

Monthly average pH decreased by 0.01 pH units per year.

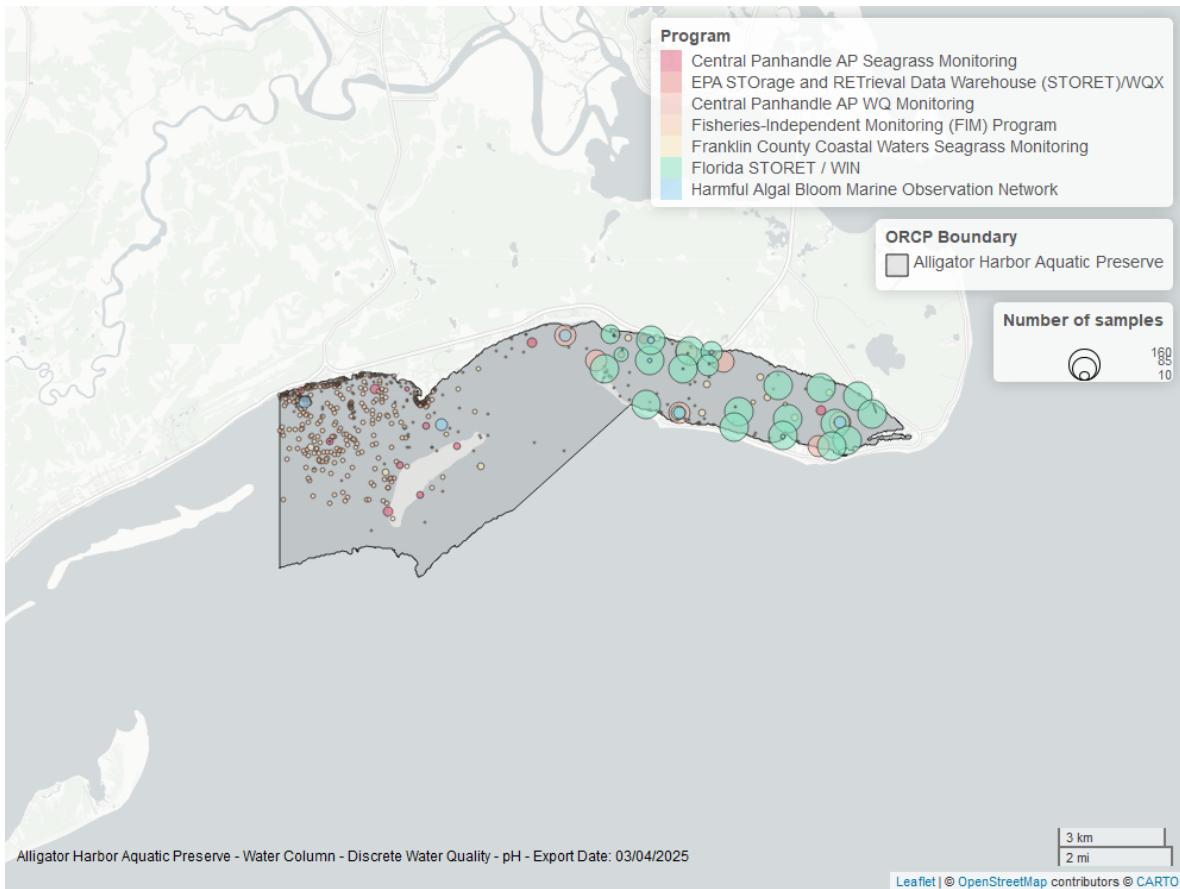


Figure 22: Map showing location of discrete water quality sampling locations within the boundaries of *Alligator Harbor Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

pH - Continuous

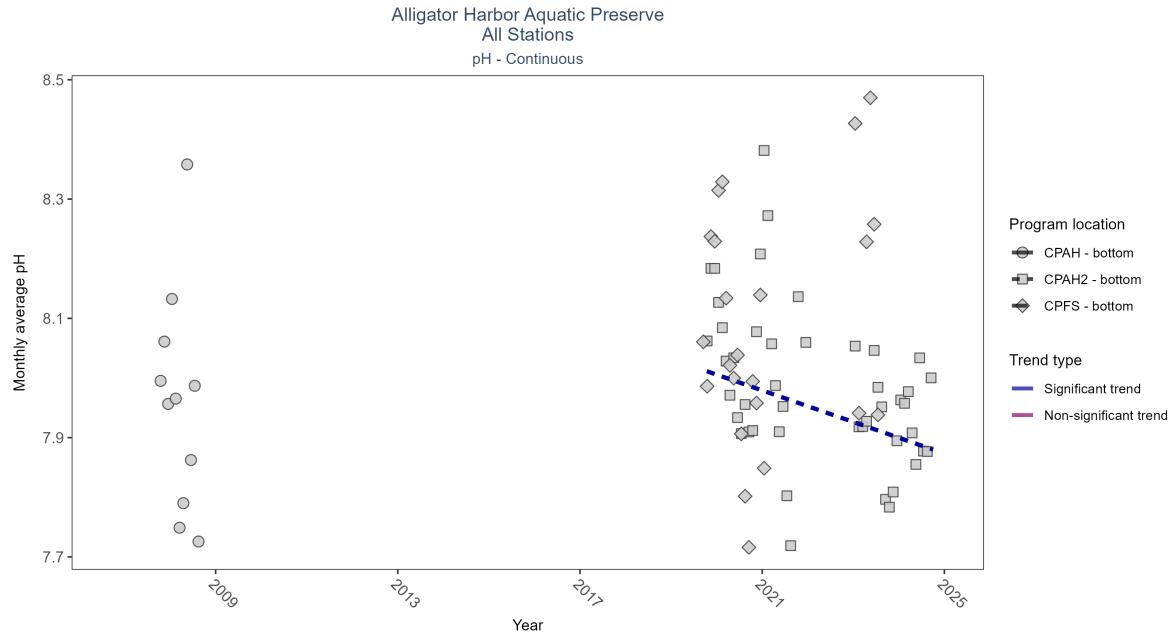


Figure 23: Scatter plot of monthly average pH over time at continuously monitored program locations. Each location is analyzed separately, with significant (blue) or non-significant (magenta) trend lines shown for time series that included five or more years of observations.

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
CPFS	Insufficient data to calculate trend	43191	4	2019 - 2023	8.1	-	-	-	-
CPAH2	Significantly decreasing trend	105891	5	2019 - 2024	8.0	-0.35	8.03	-0.03	0.034
CPAH	Insufficient data to calculate trend	13034	2	2007 - 2008	7.9	-	-	-	-

At one program location, monthly average pH decreased by 0.03 pH units per year. There was insufficient data to fit a model for two locations.

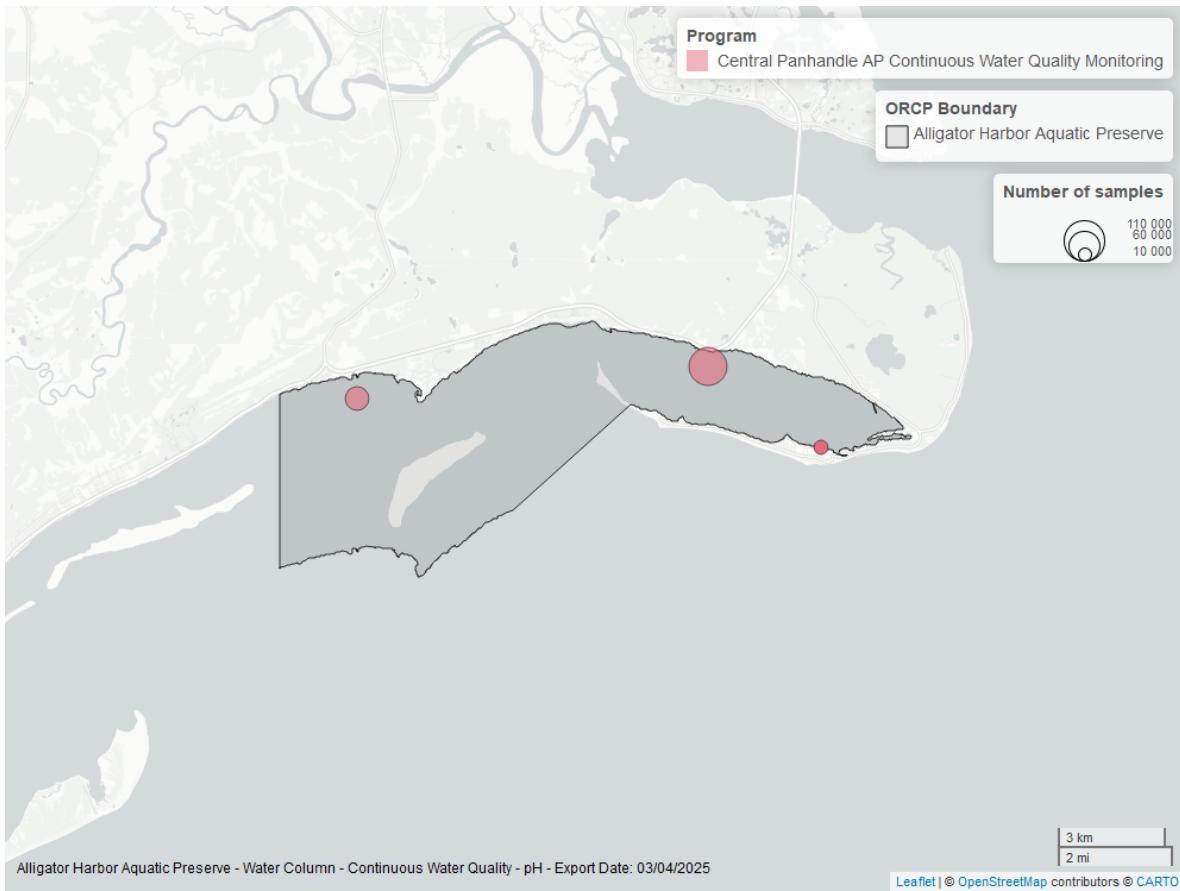


Figure 24: Map showing location of ph continuous water quality sampling locations within the boundaries of *Alligator Harbor Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Water Clarity

Turbidity - Discrete

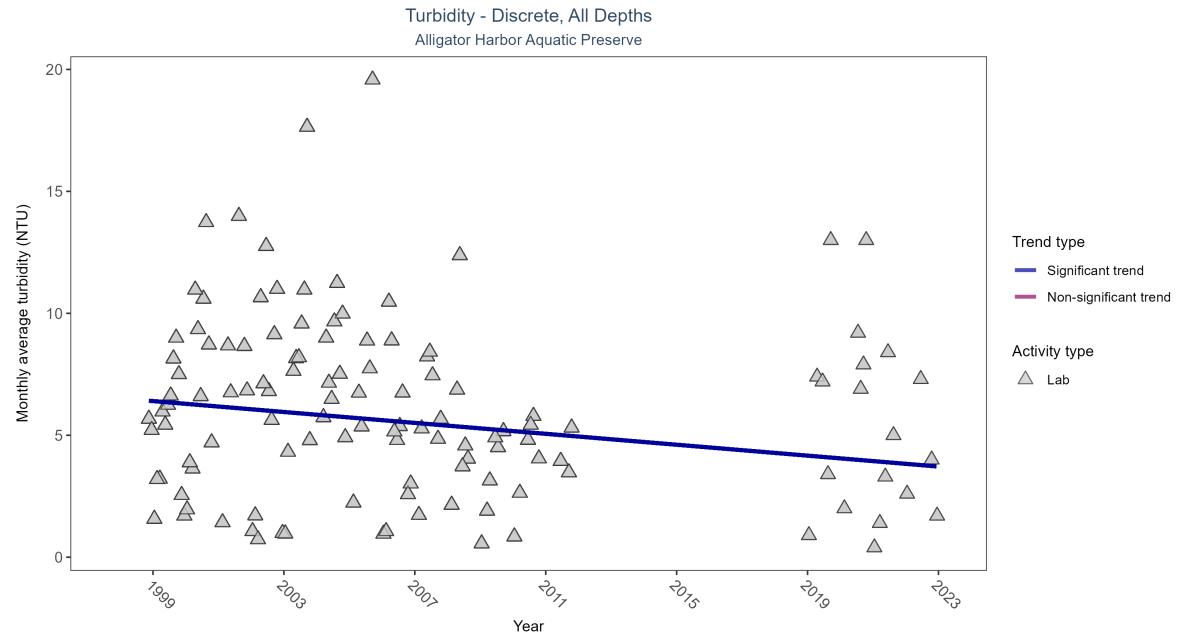


Figure 25: Scatter plot of monthly average turbidity over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Only turbidity values measured in the laboratory (triangles) are included in the plot.

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	Significantly decreasing trend	3543	18	1998 - 2022	5.3	-0.24321	6.51312	-0.11185	0.0012

Monthly average turbidity decreased by 0.11 NTU per year, indicating an increase in water clarity.

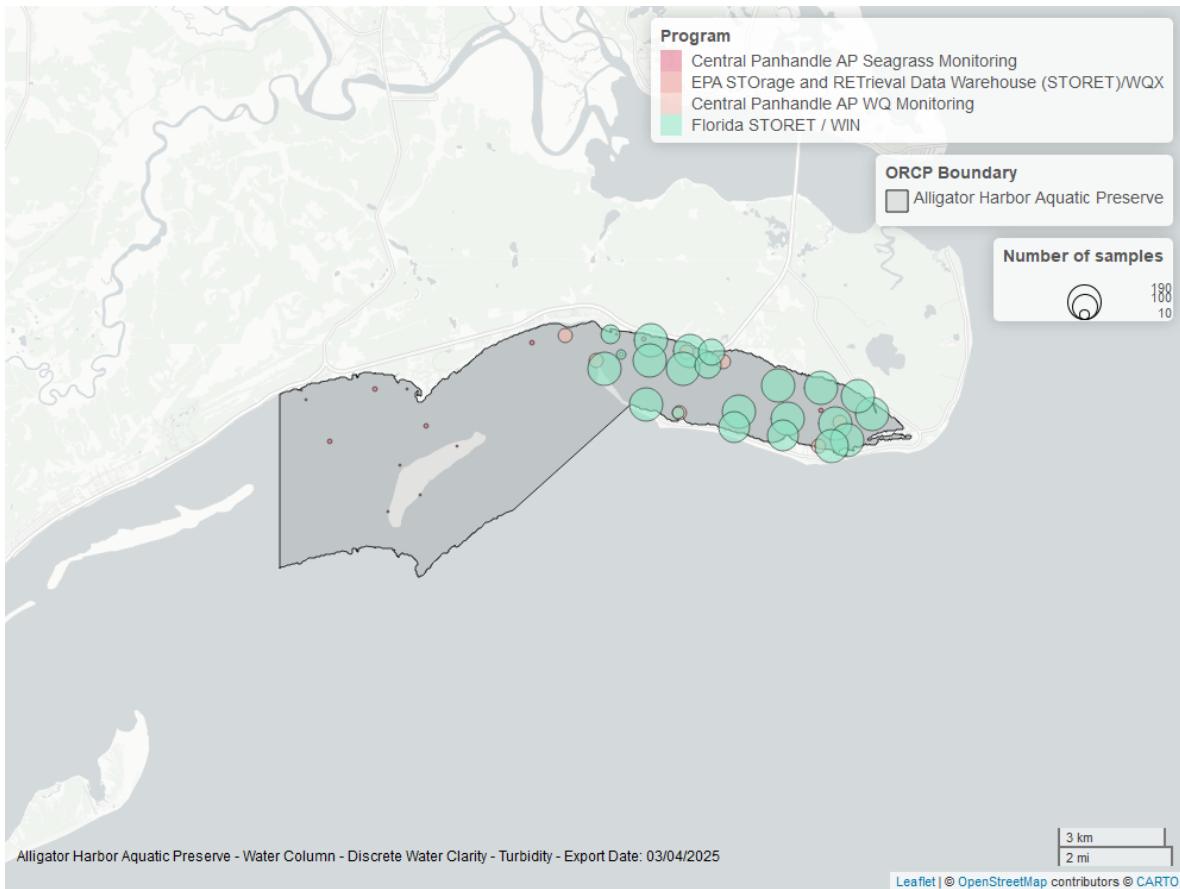


Figure 26: Map showing location of discrete water quality sampling locations within the boundaries of *Alligator Harbor Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Turbidity - Continuous

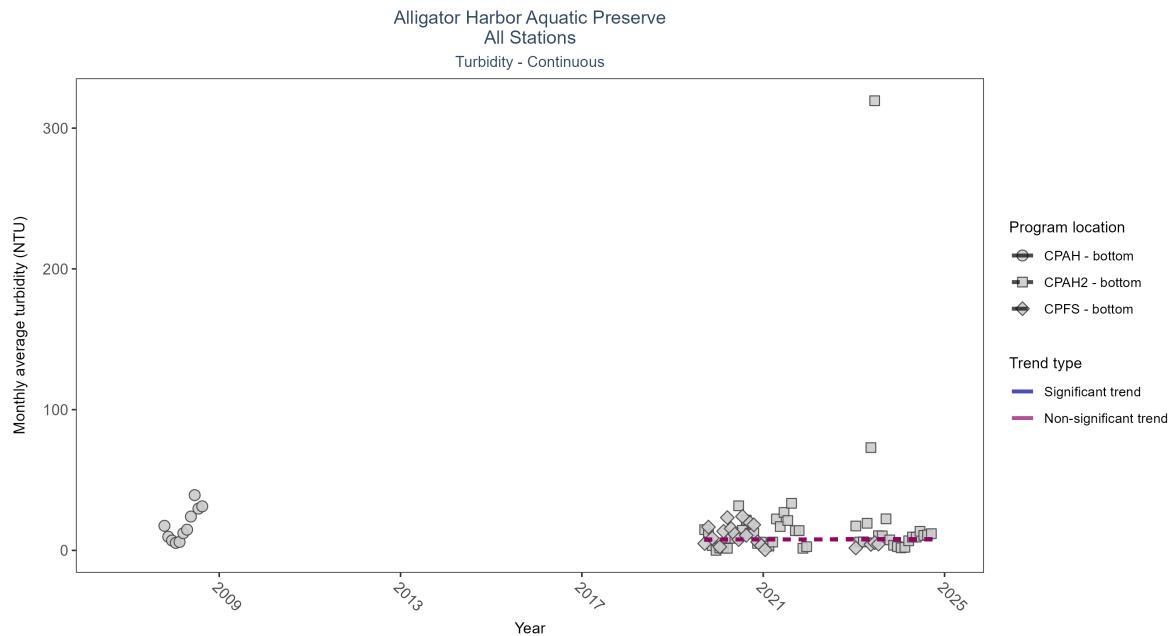


Figure 27: Scatter plot of monthly average turbidity over time at continuously monitored program locations. Each location is analyzed separately, with significant (blue) or non-significant (magenta) trend lines shown for time series that included five or more years of observations.

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
CPFS	Insufficient data to calculate trend	37491	4	2019 - 2023	-	4	-	-	-
CPAH2	No significant trend	114055	5	2019 - 2024	-	6	0.09	7.7	0.04
CPAH	Insufficient data to calculate trend	12558	2	2007 - 2008	-	10	-	-	0.6366

No detectable change in monthly average turbidity was observed at one location. There was insufficient data to fit a model for two locations.

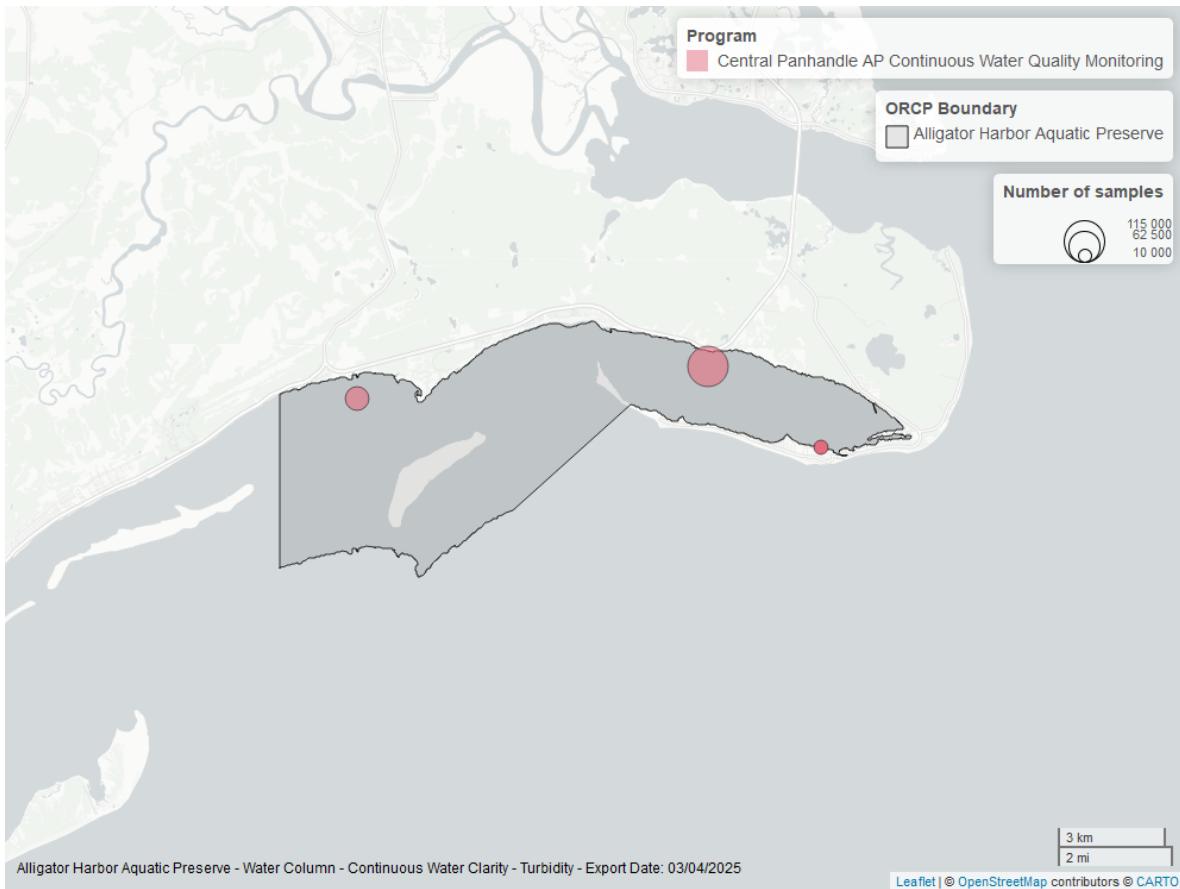


Figure 28: Map showing location of turbidity continuous water quality sampling locations within the boundaries of *Alligator Harbor Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Total Suspended Solids - Discrete

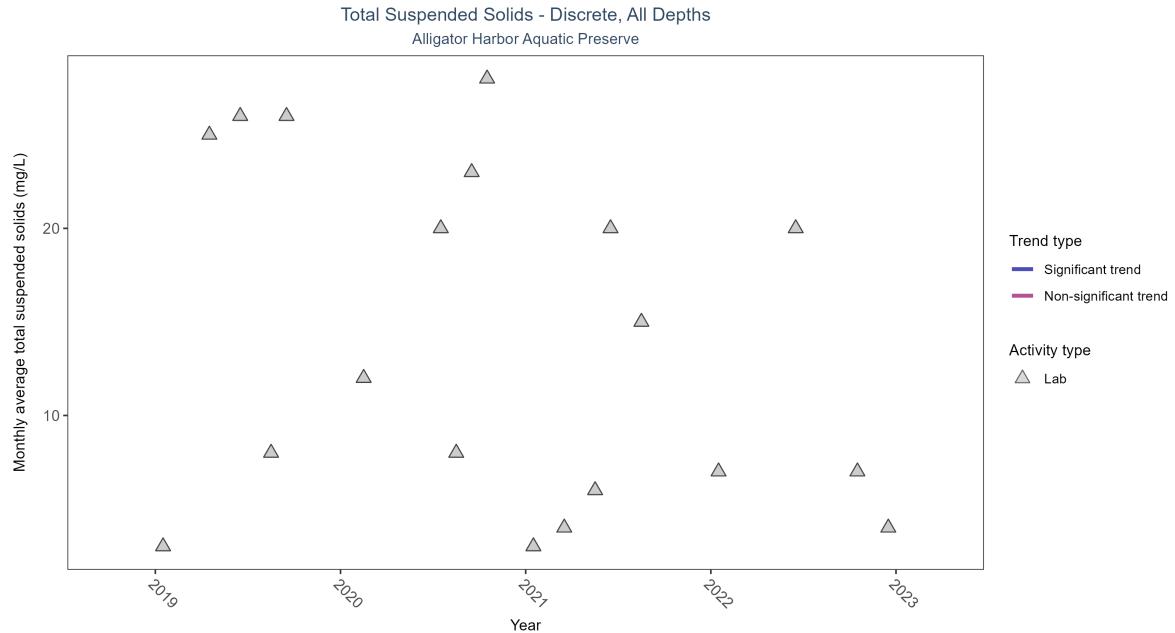


Figure 29: Scatter plot of monthly average total suspended solids (TSS) over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Only TSS values obtained from laboratory analyses (triangles) are included 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	Insufficient data to calculate trend	19	4	2019 - 2022	12	-	-	-	-

There was insufficient data to fit a model for total suspended solids.

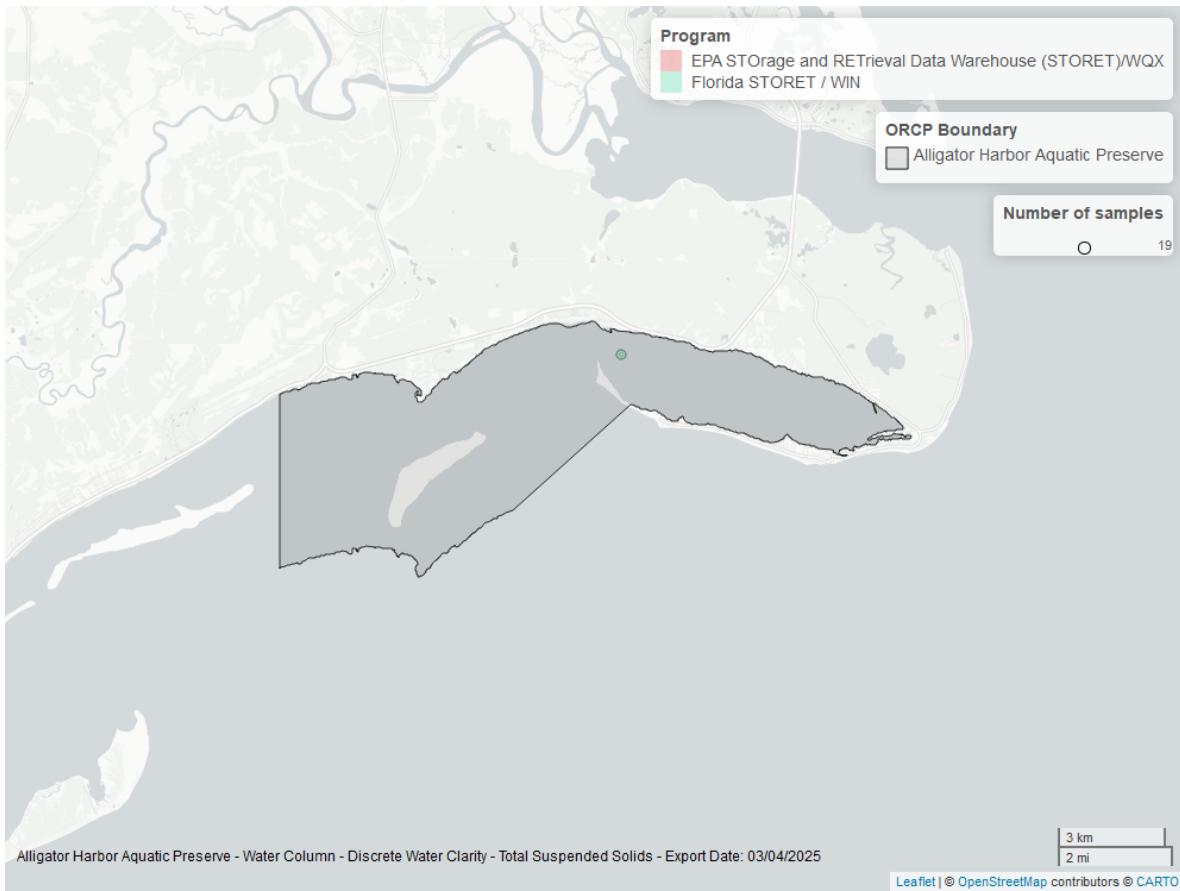


Figure 30: Map showing location of discrete water quality sampling locations within the boundaries of *Alligator Harbor Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Chlorophyll a, Uncorrected for Pheophytin - Discrete

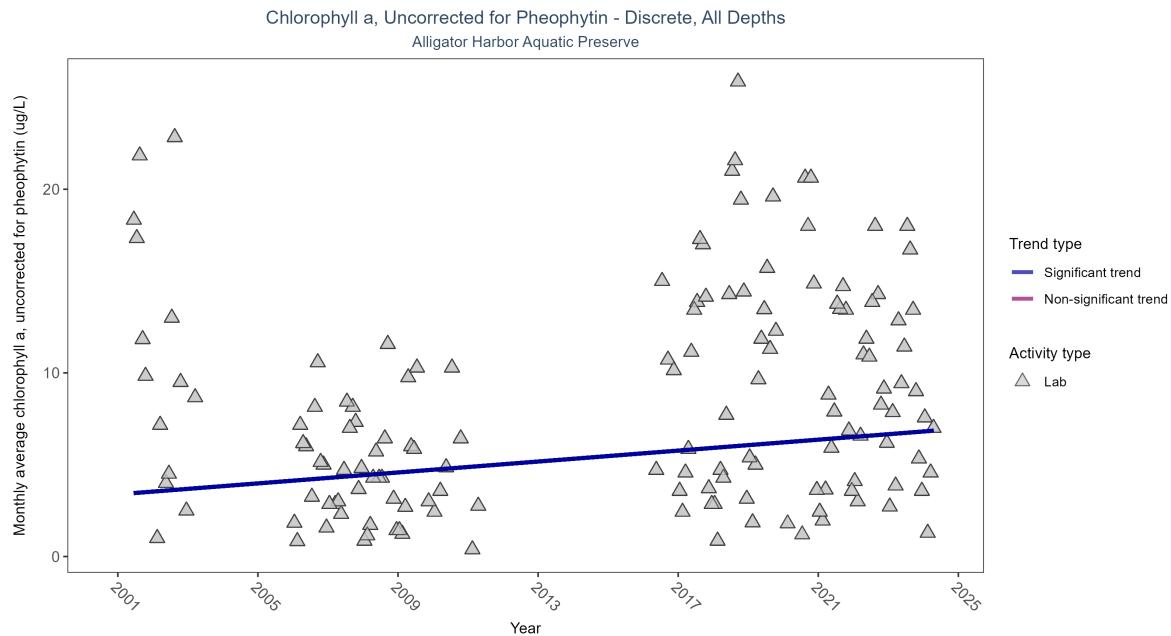


Figure 31: Scatter plot of monthly average levels of chlorophyll a, uncorrected for pheophytin, over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Only laboratory-analyzed chlorophyll a (triangles) 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	1213	18	2001 - 2024	6	0.28623	3.3869	0.14881	0

Monthly average chlorophyll a, uncorrected for pheophytin, increased by $0.15 \mu\text{g/L}$ per year, indicating a decrease in water clarity.

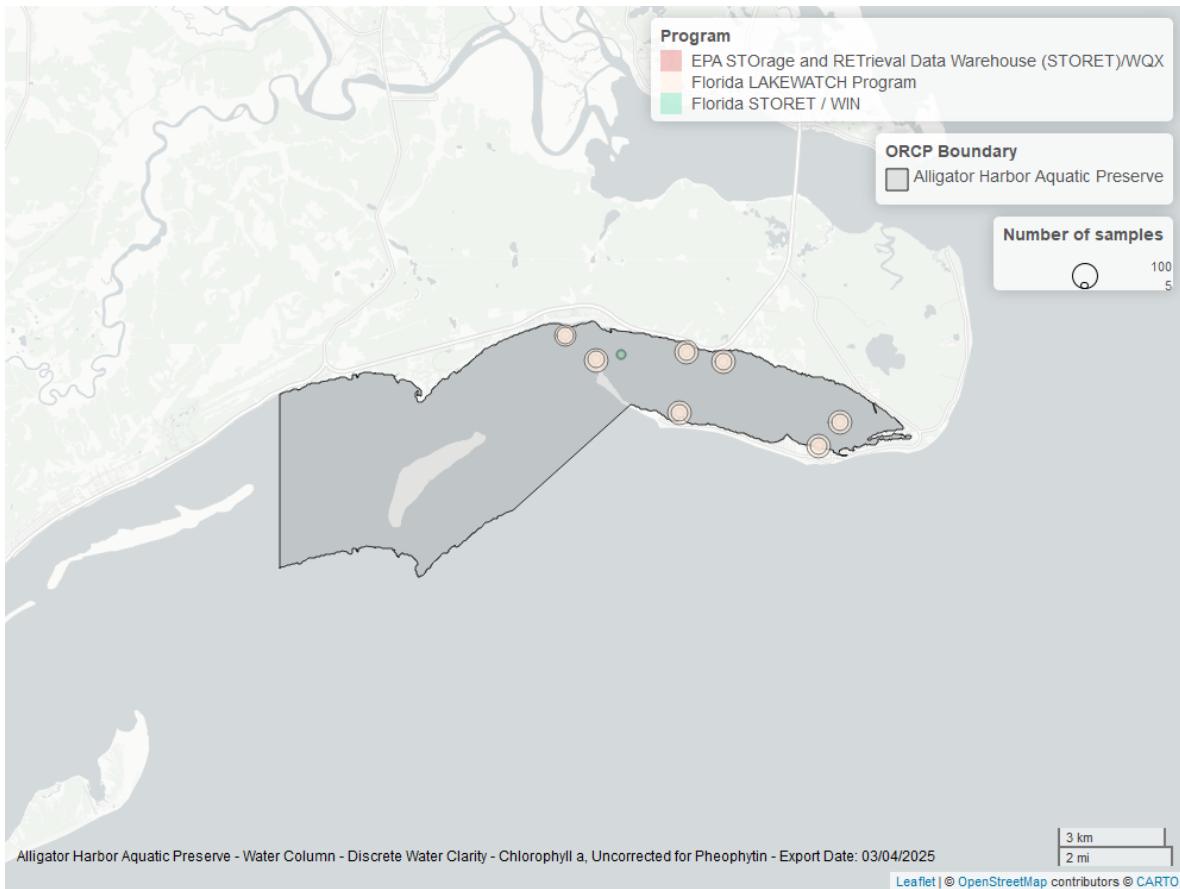


Figure 32: Map showing location of discrete water quality sampling locations within the boundaries of *Alligator Harbor Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Chlorophyll a, Corrected for Pheophytin - Discrete

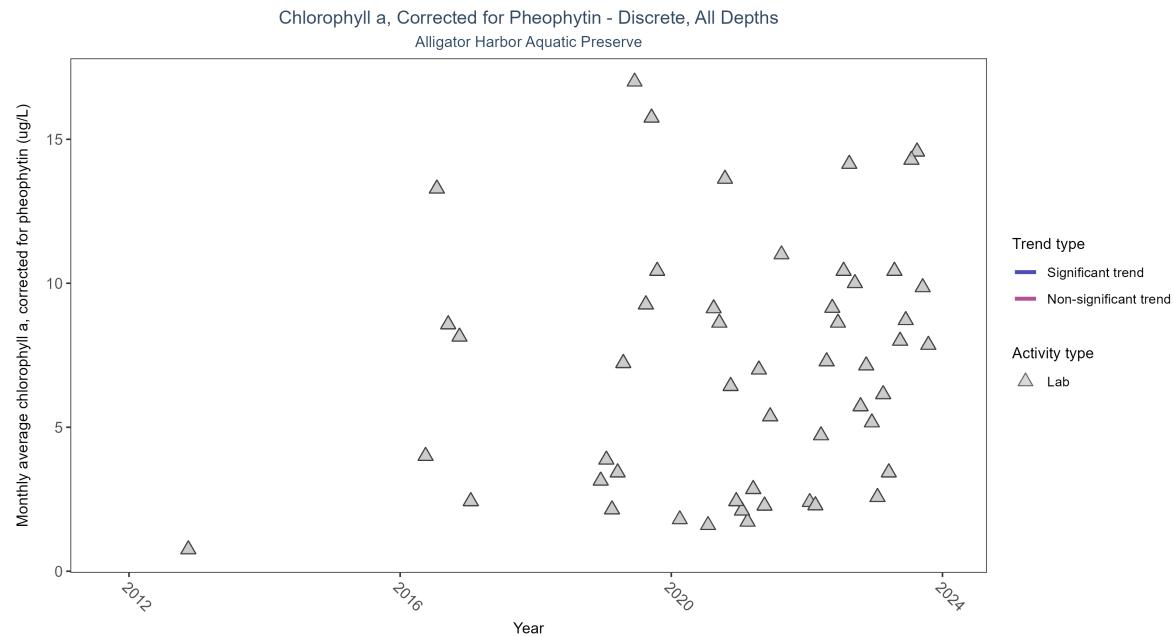


Figure 33: Scatter plot of monthly average levels of chlorophyll a, corrected for pheophytin, over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Only laboratory-analyzed chlorophyll a (triangles) 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	Insufficient data to calculate trend	339	9	2012 - 2023	6	-	-	-	-

There was insufficient data to fit a model for chlorophyll a, corrected for pheophytin.

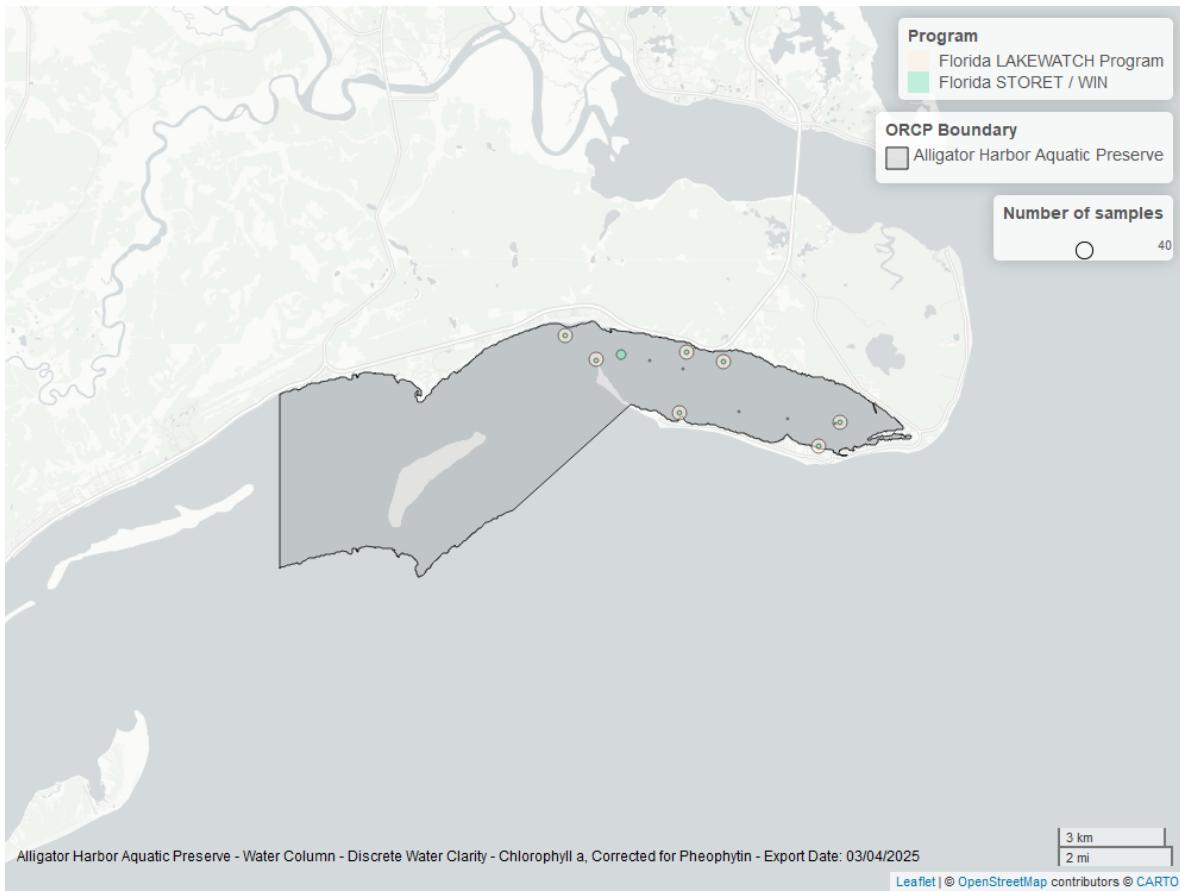


Figure 34: Map showing location of discrete water quality sampling locations within the boundaries of *Alligator Harbor Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Secchi Depth - Discrete

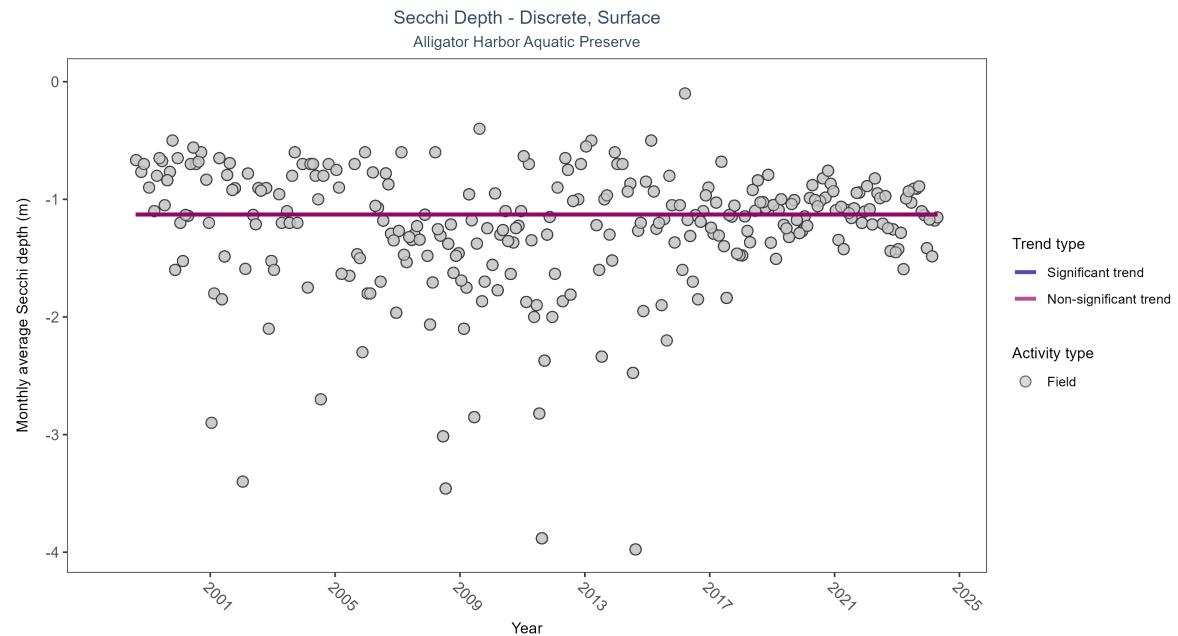


Figure 35: Scatter plot of monthly average Secchi depth over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Secchi depth is only measured in the field (circles).

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	No significant trend	2857	27	1998 - 2024	-1.15825	0.00086	-1.12912	0	1

Secchi depth showed no detectable trend between 1998 and 2024.

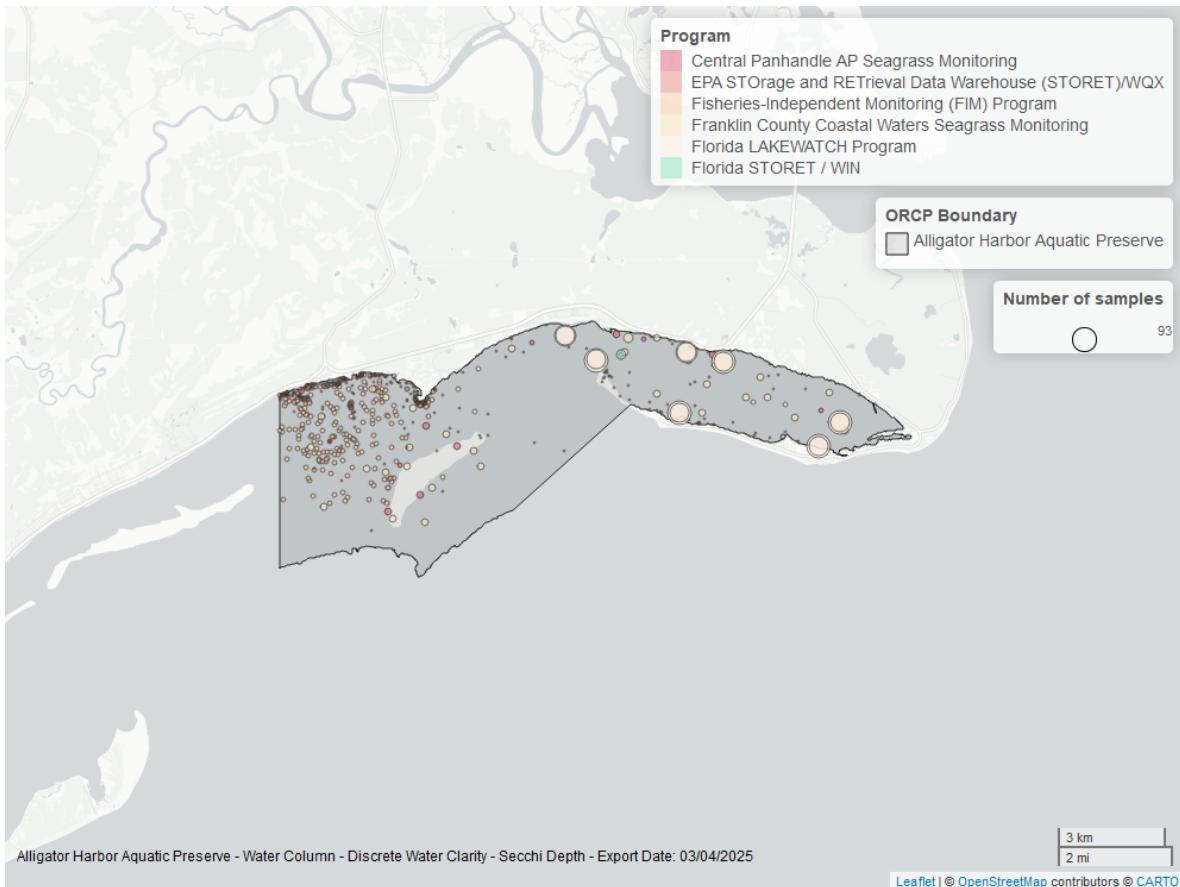


Figure 36: Map showing location of discrete water quality sampling locations within the boundaries of *Alligator Harbor Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Colored Dissolved Organic Matter - Discrete

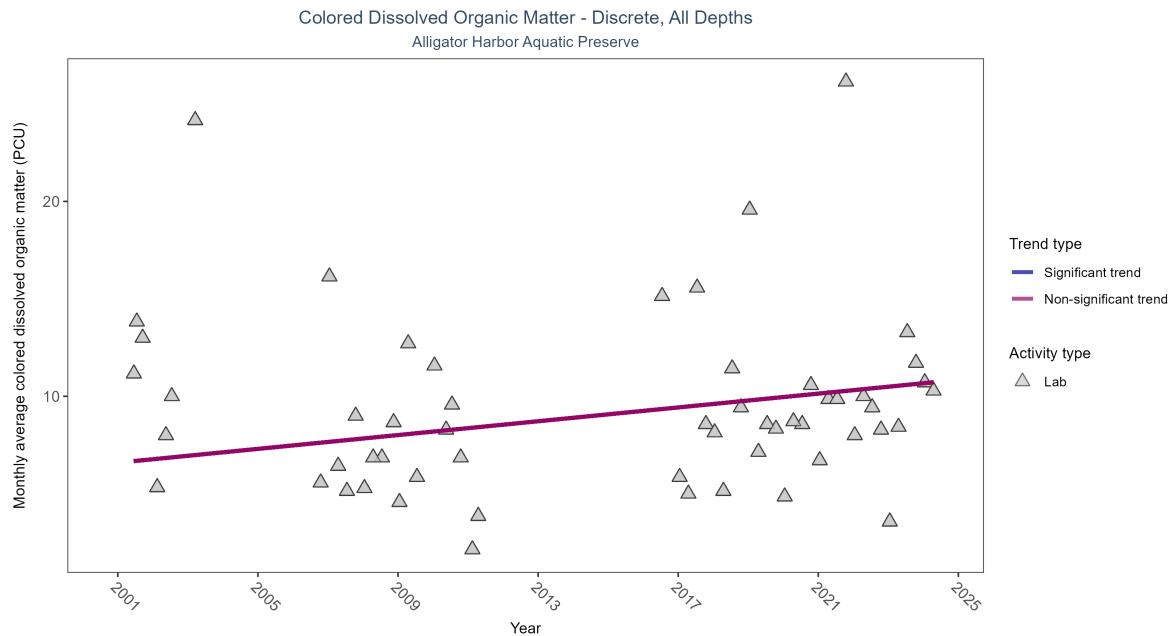


Figure 37: Scatter plot of monthly average colored dissolved organic matter (CDOM) over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Only laboratory-analyzed CDOM (triangles) is included in the 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	No significant trend	409	18	2001 - 2024	8	0.21024	6.59392	0.1772	0.0598

Colored dissolved organic matter showed no detectable trend between 2001 and 2024.

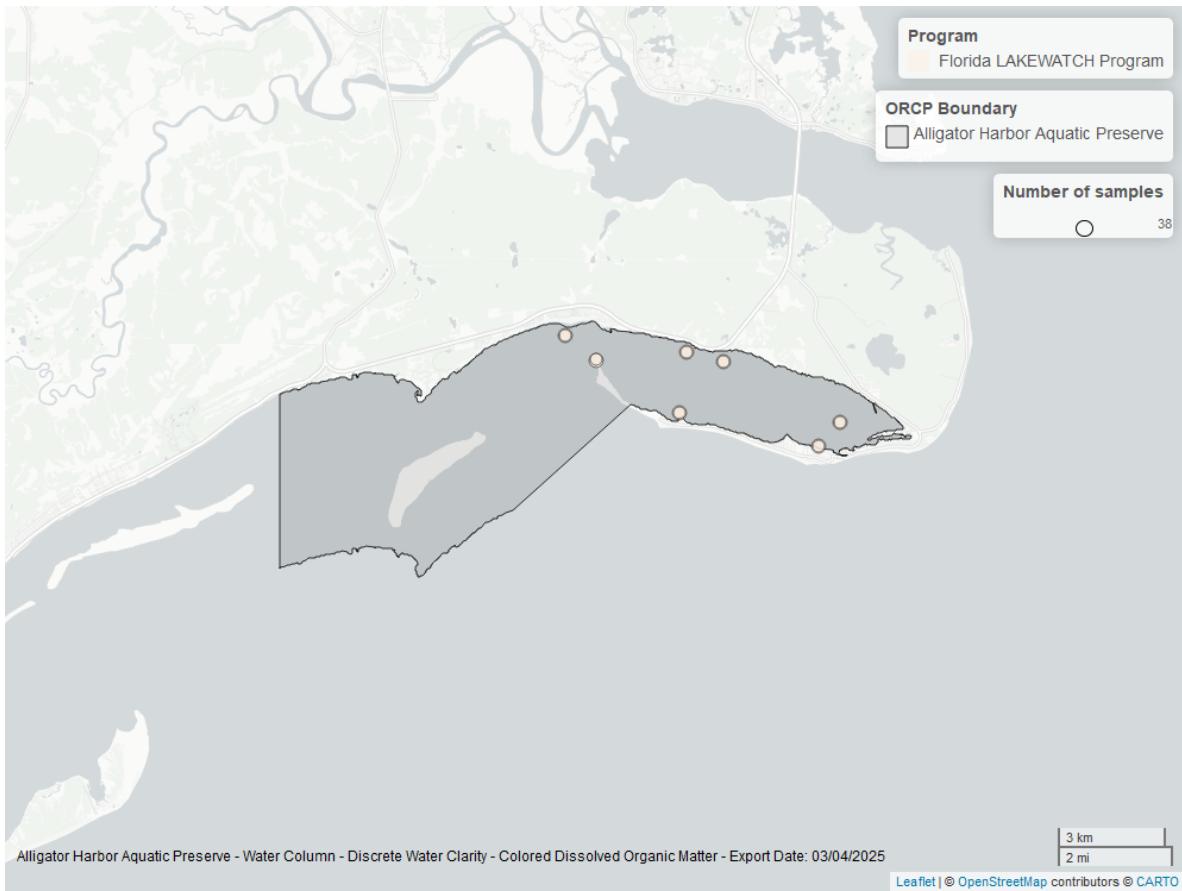


Figure 38: Map showing location of discrete water quality sampling locations within the boundaries of *Alligator Harbor Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.