

Indian River-Vero Beach to Ft. Pierce Aquatic Preserve

SEACAR Water Quality Analysis

Last compiled on 30 September, 2025

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Indicators

Nutrients

Total Nitrogen - Discrete

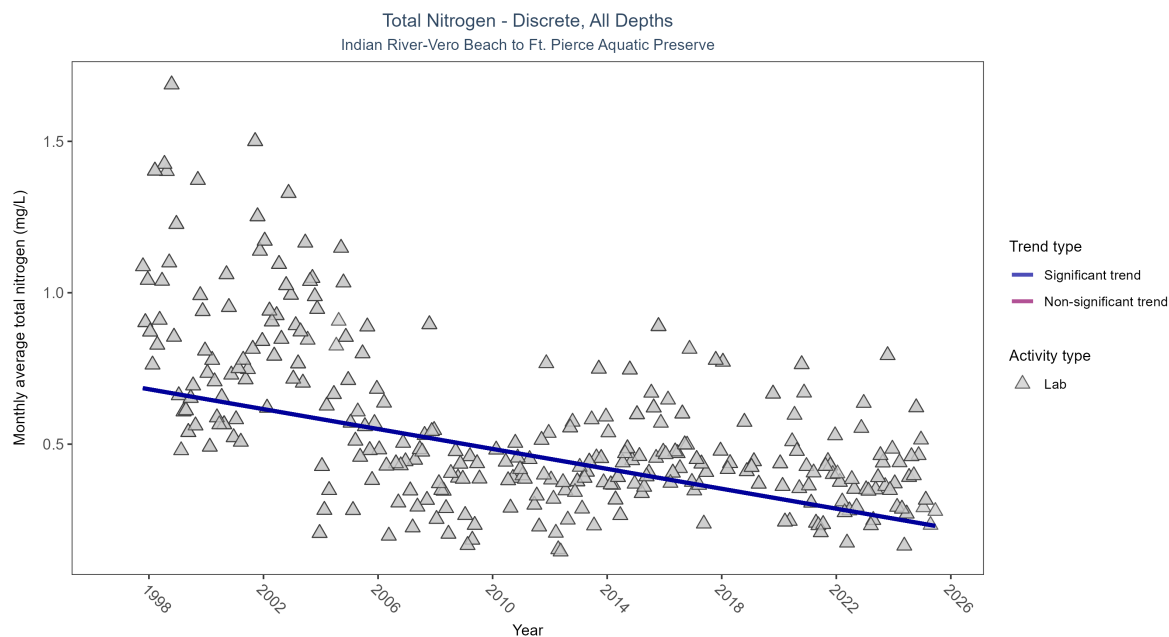


Figure 1: Scatter plot of monthly average total nitrogen over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Only nitrogen values obtained from laboratory analyses (triangles) are included in the 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 decreasing trend	1053	29	1997 - 2025	0.521	-0.43113	0.69782	-0.01644	0

Monthly average total nitrogen decreased by 0.02 mg/L per year.

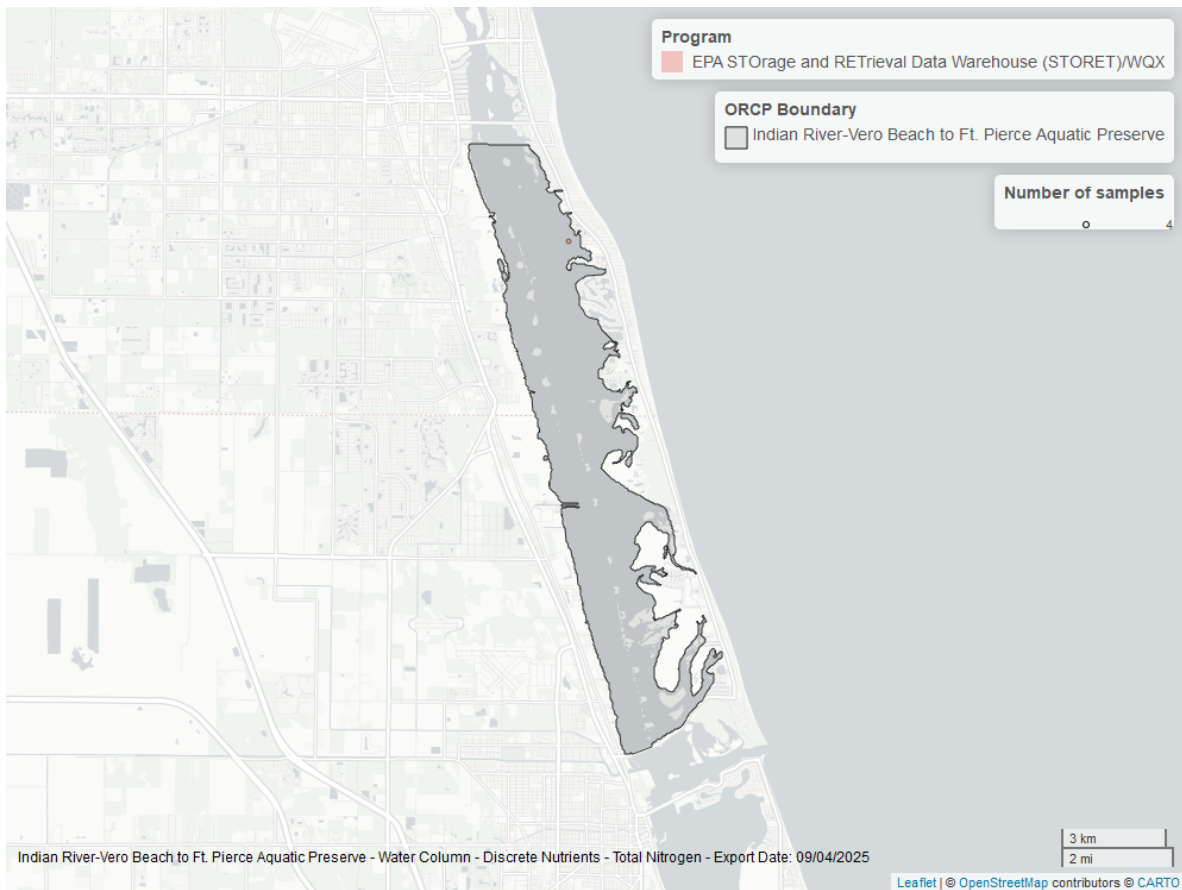


Figure 2: Map showing location of discrete water quality sampling locations within the boundaries of *Indian River-Vero Beach to Ft. Pierce Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Total Phosphorus - Discrete

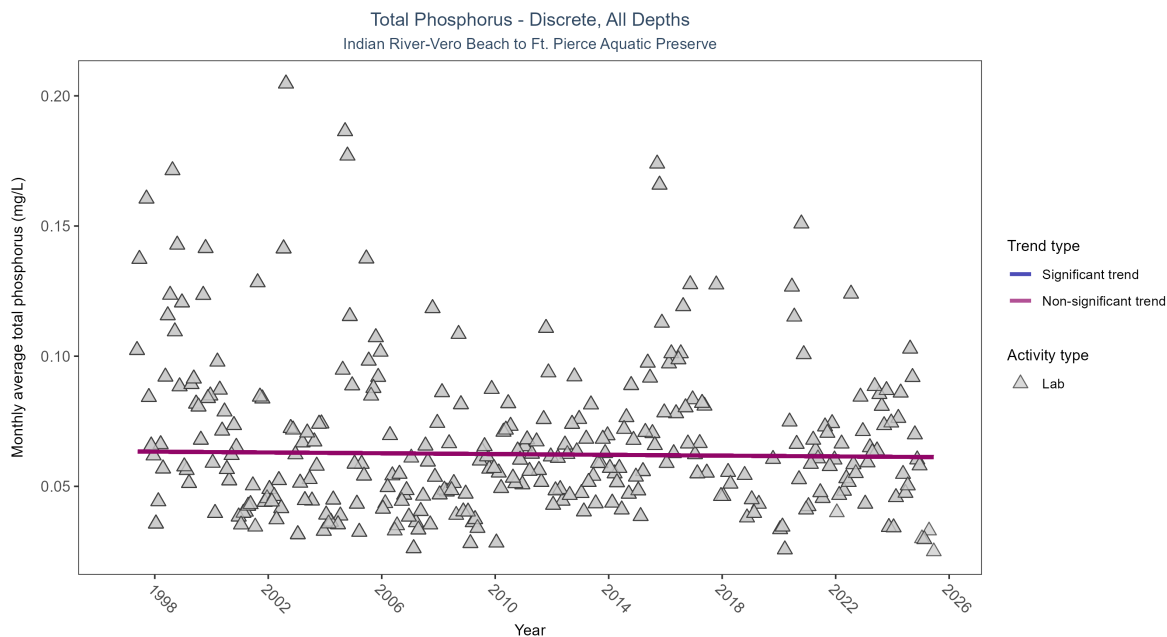


Figure 3: Scatter plot of monthly average total phosphorus over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Only phosphorus values obtained from laboratory analyses (triangles) are included in 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	2125	29	1997 - 2025	0.06	-0.02431	0.0634	-0.00008	0.5434

Total phosphorus showed no detectable trend between 1997 and 2025.

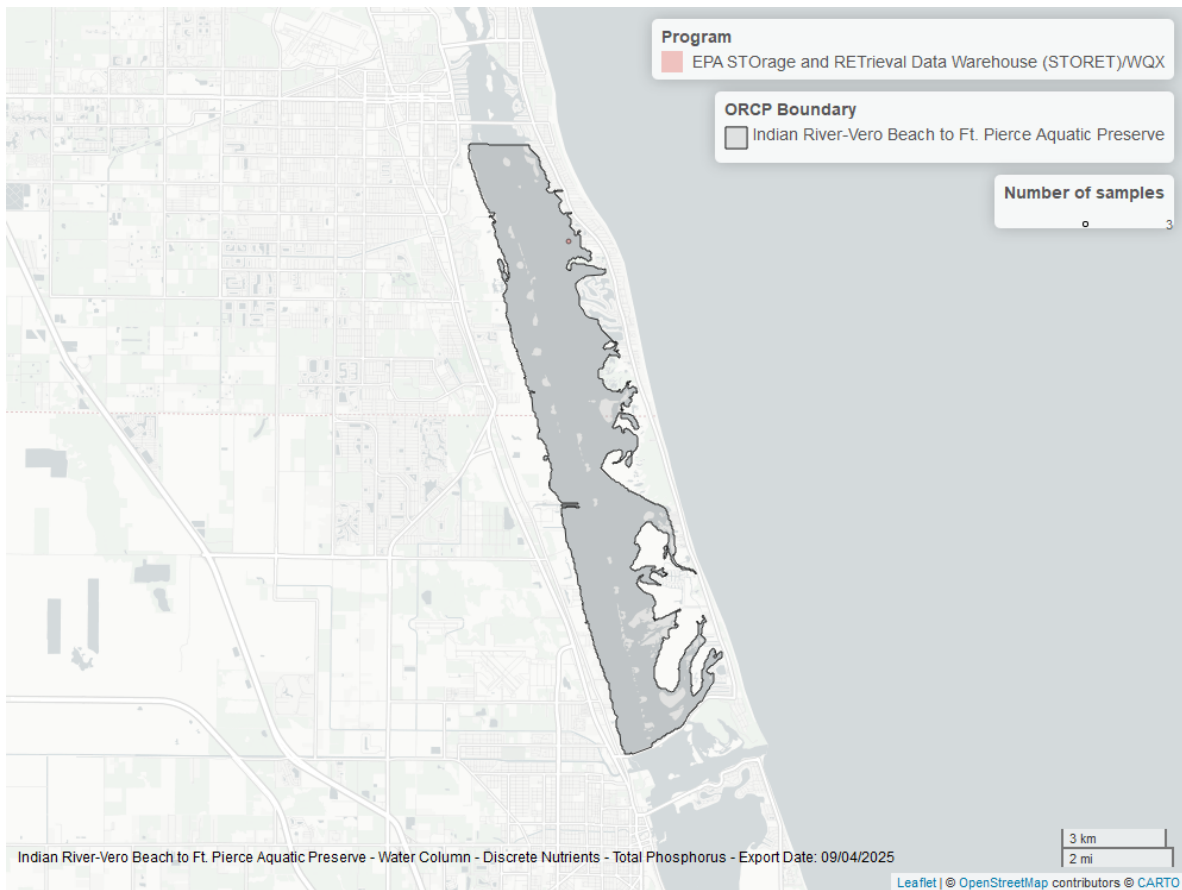


Figure 4: Map showing location of discrete water quality sampling locations within the boundaries of *Indian River-Vero Beach to Ft. Pierce Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Water Quality

Dissolved Oxygen - Discrete

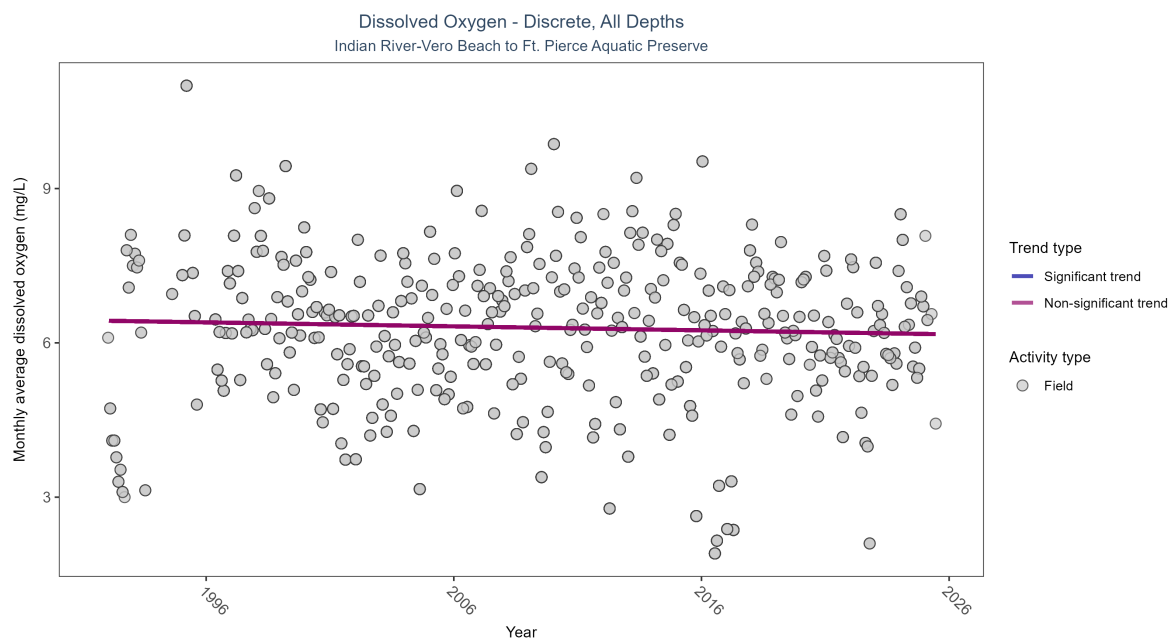


Figure 5: Scatter plot of monthly average dissolved oxygen over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Only dissolved oxygen values measured in the field (circles) are included in the plot.

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	No significant trend	8019	34	1992 - 2025	6.3	-0.05313	6.42945	-0.00776	0.1565

Dissolved oxygen showed no detectable trend between 1992 and 2025.

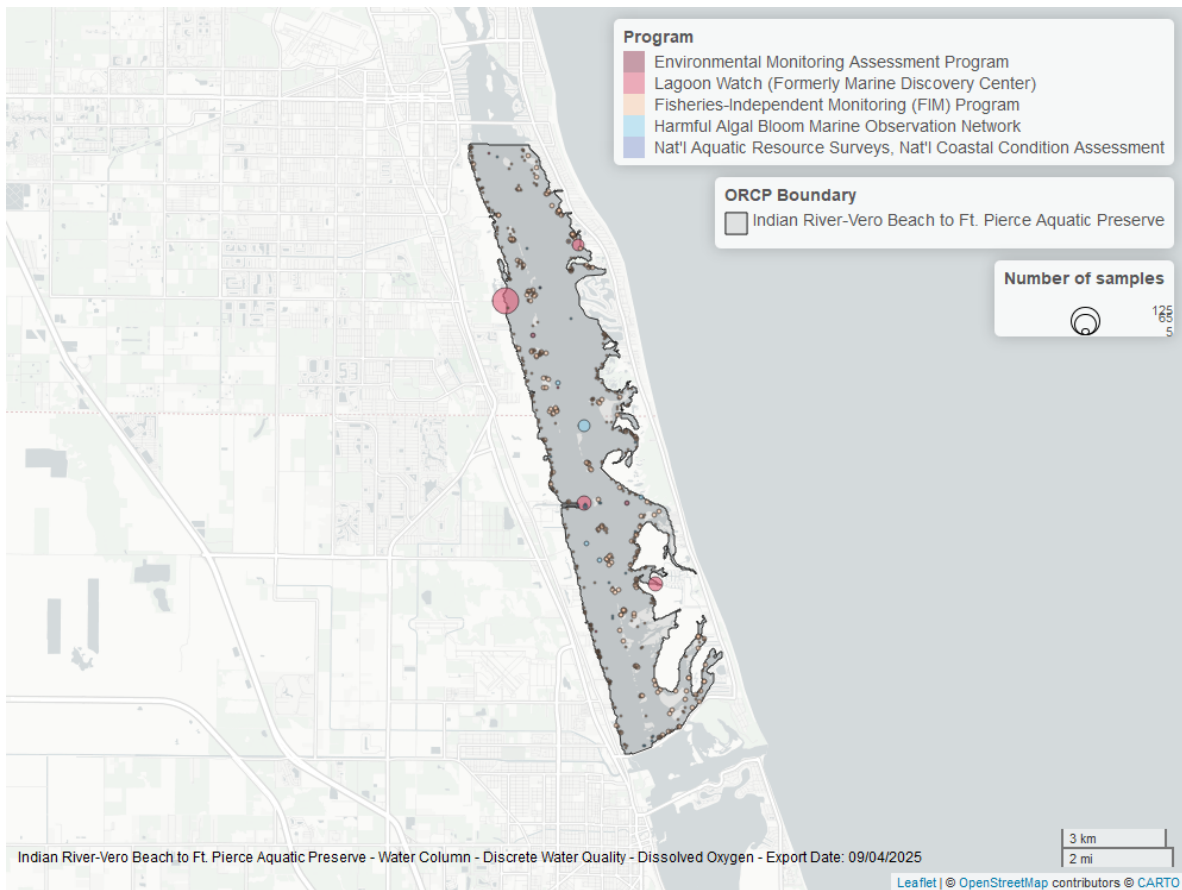


Figure 6: Map showing location of discrete water quality sampling locations within the boundaries of *Indian River-Vero Beach to Ft. Pierce Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Dissolved Oxygen Saturation - Discrete

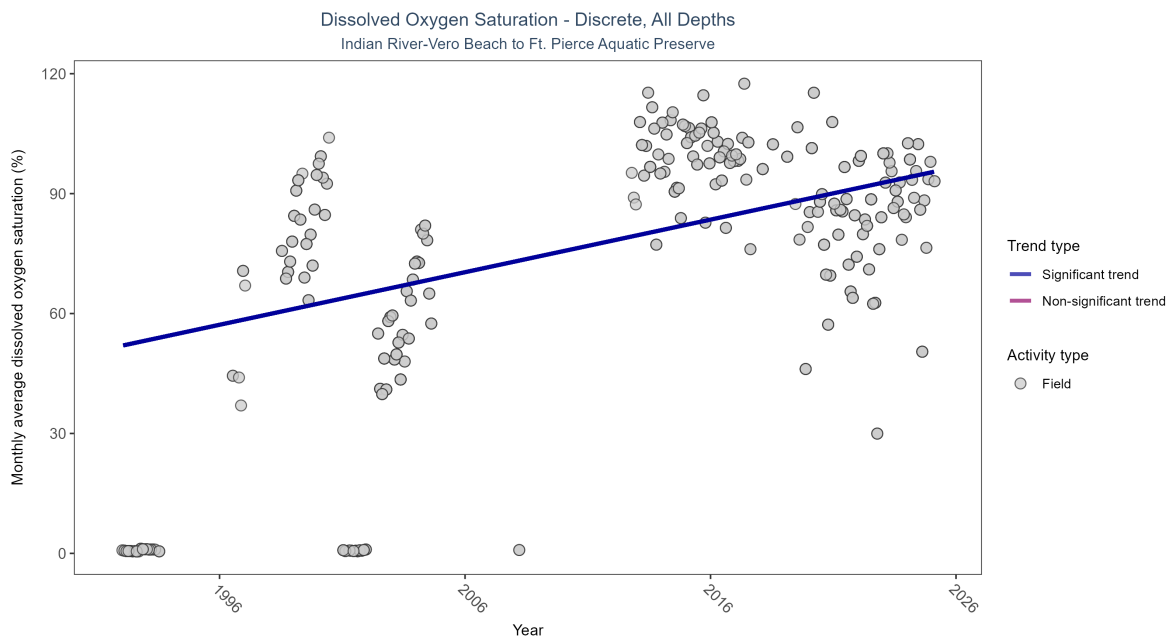


Figure 7: Scatter plot of monthly average dissolved oxygen saturation over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Only dissolved oxygen saturation values measured in the field (circles) are included in the plot.

Table 4: 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	862	26	1992 - 2025	84.45	0.34407	51.92661	1.3154	0

Monthly average dissolved oxygen saturation increased by 1.32% per year.

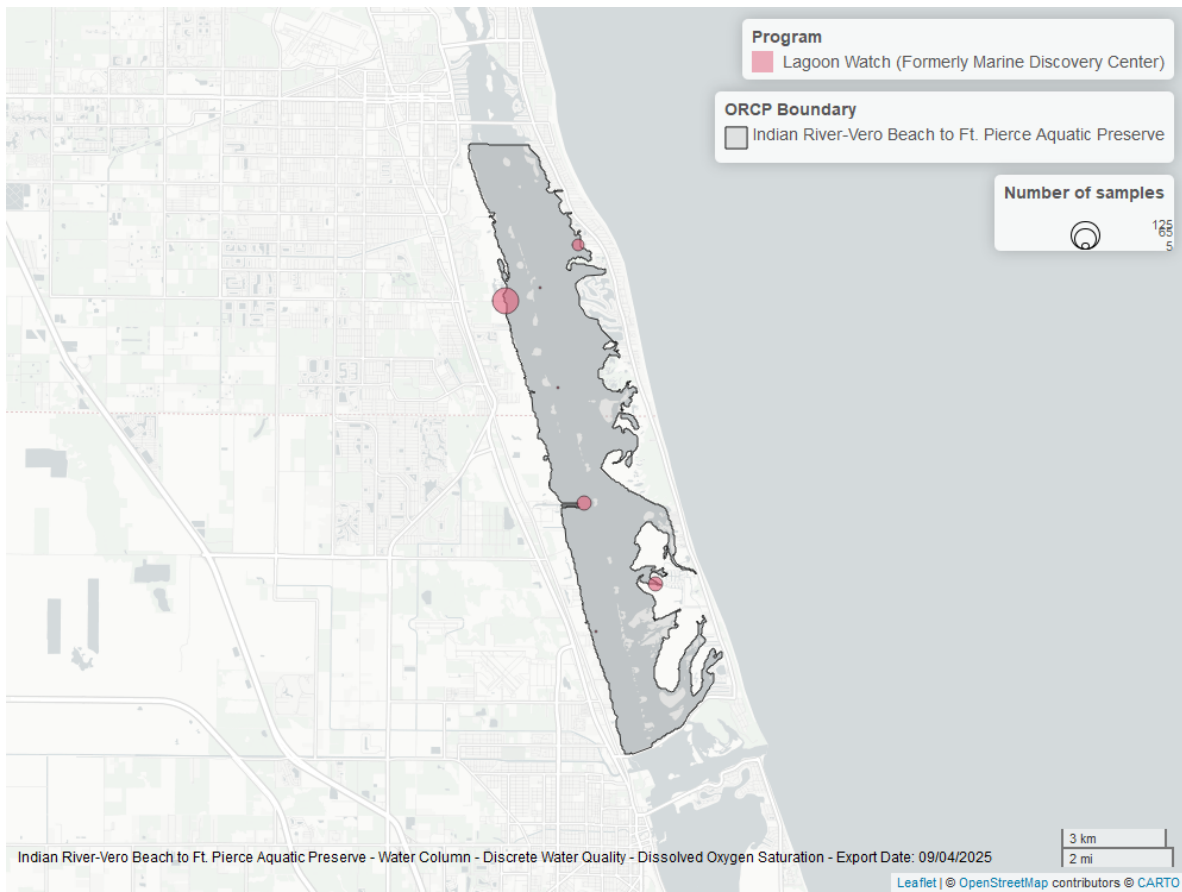


Figure 8: Map showing location of discrete water quality sampling locations within the boundaries of *Indian River-Vero Beach to Ft. Pierce Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Salinity - Discrete

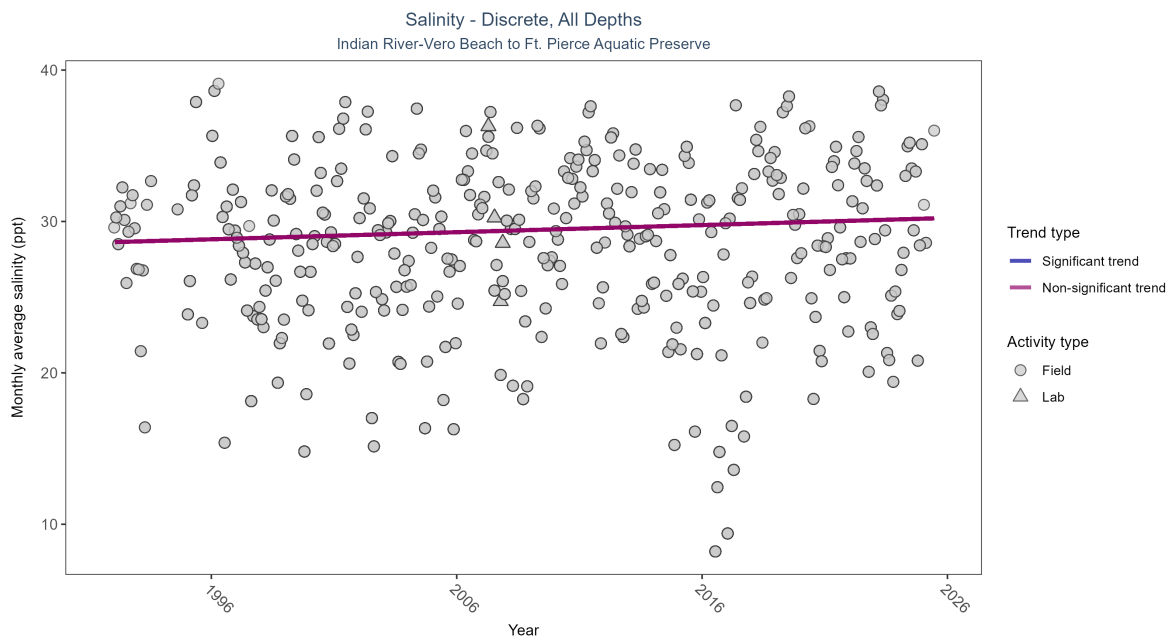


Figure 9: Scatter plot of monthly average salinity over time. If the time series included ten or more years of discrete observations, significant (blue) or non-significant (magenta) trend lines are also shown. Discrete salinity values derived from grab samples analyzed in the field (circles) or the laboratory (triangles) are both included in the plot.

Table 5: 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	No significant trend	8801	34	1992 - 2025	29.1	0.0656	28.63432	0.04695	0.0699

Salinity showed no detectable trend between 1992 and 2025.

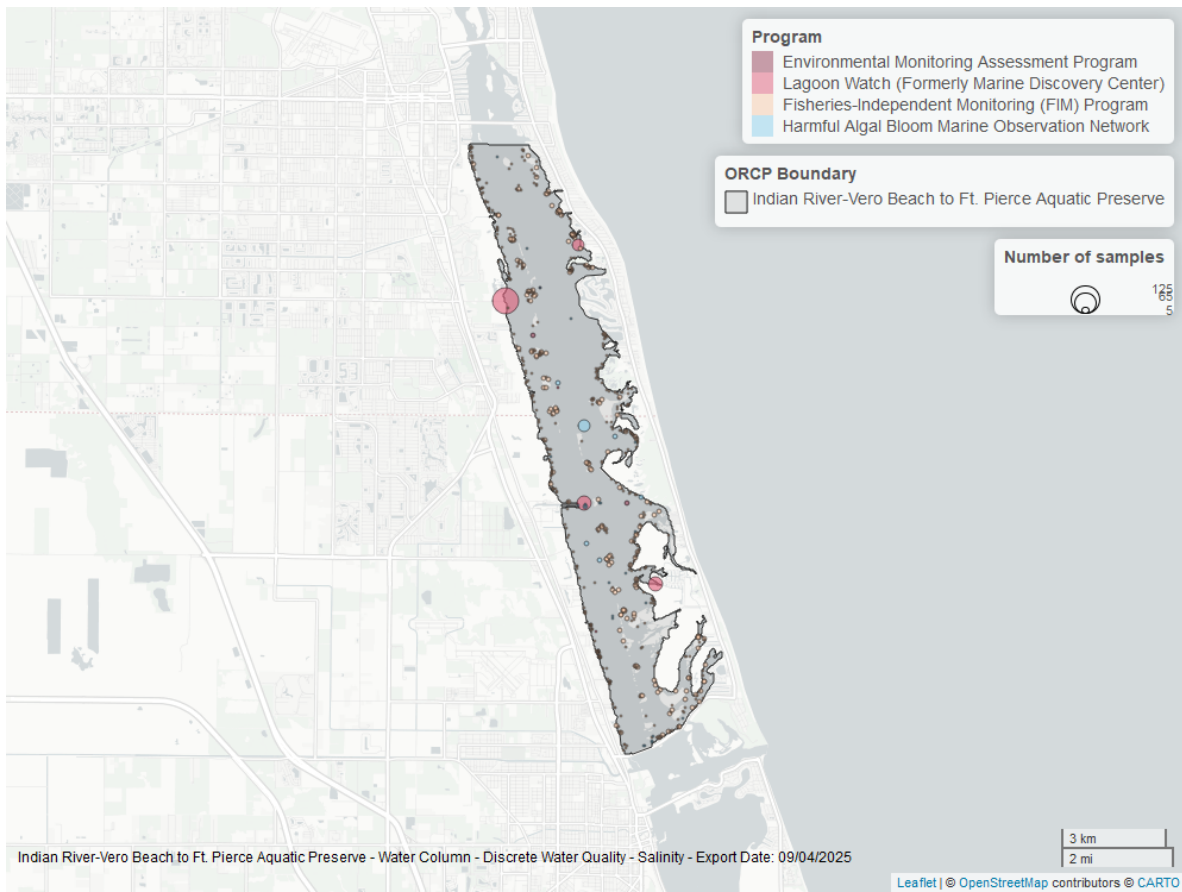


Figure 10: Map showing location of discrete water quality sampling locations within the boundaries of *Indian River-Vero Beach to Ft. Pierce Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Water Temperature - Discrete

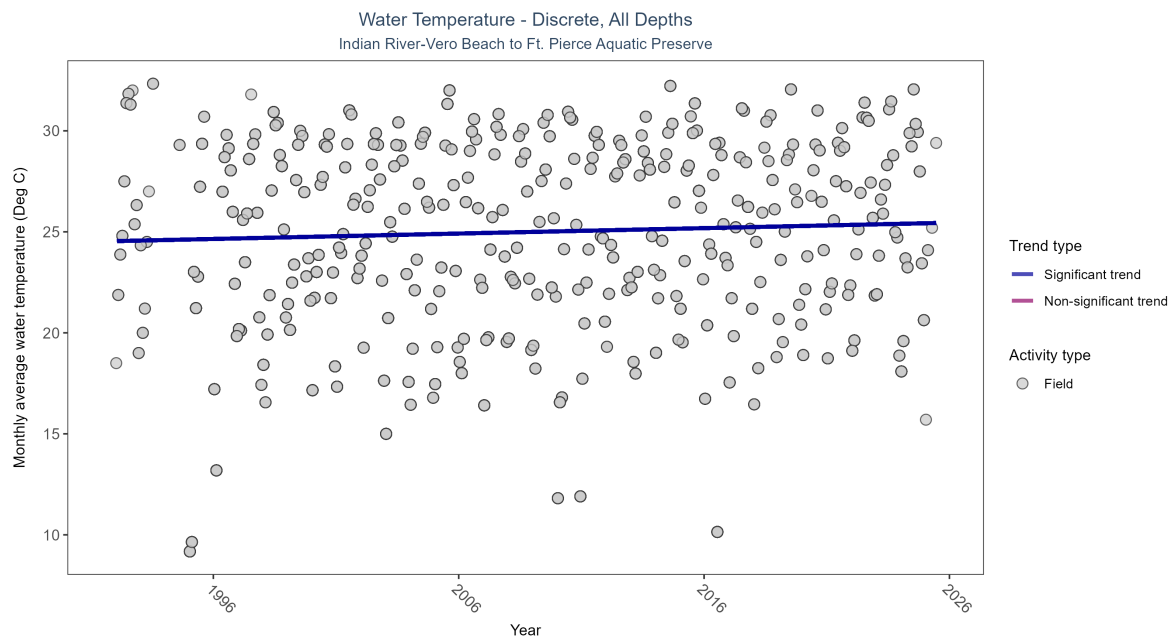


Figure 11: Scatter plot of monthly average water temperature over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Only water temperature measurements taken in the field (circles) are included in the plot.

Table 6: 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	8809	34	1992 - 2025	25.5	0.12942	24.53967	0.02679	4e-04

Monthly average water temperature increased by 0.03°C per year.

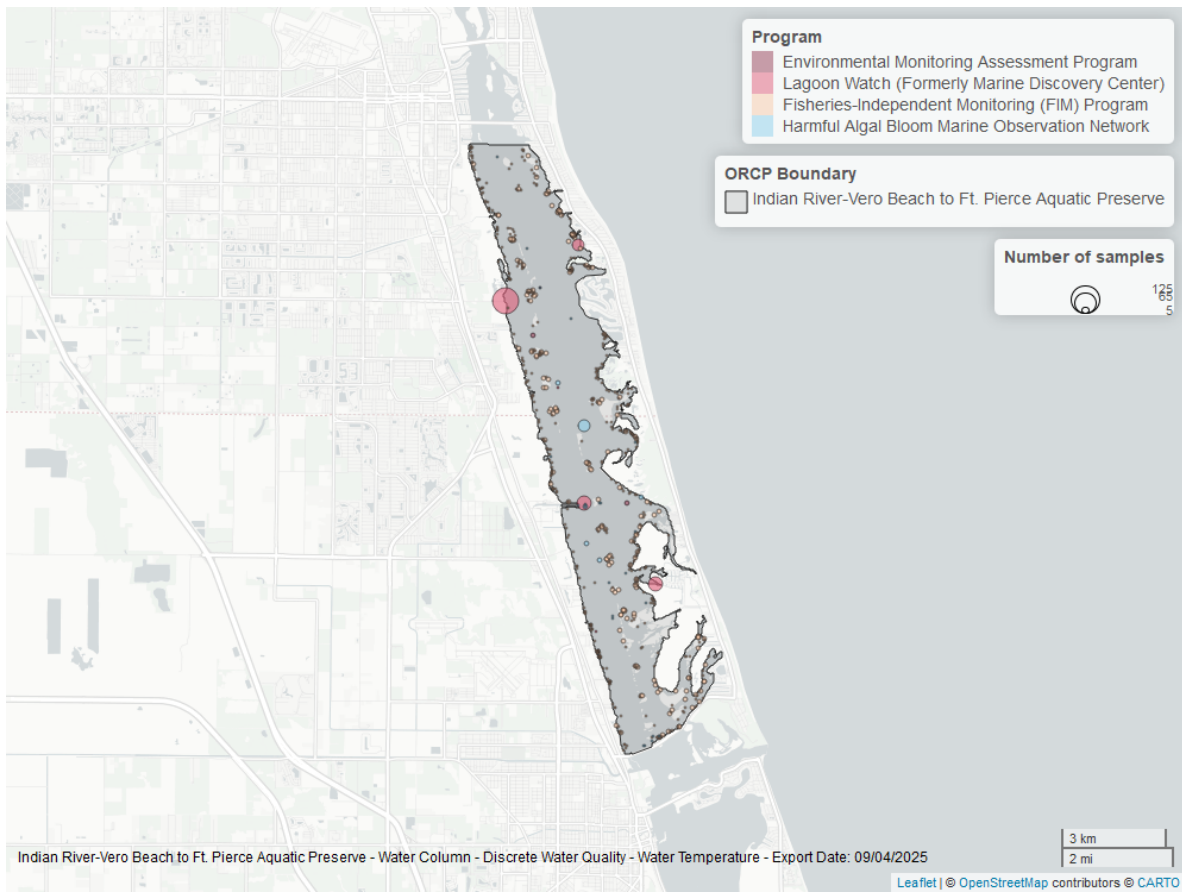


Figure 12: Map showing location of discrete water quality sampling locations within the boundaries of *Indian River-Vero Beach to Ft. Pierce Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

pH - Discrete

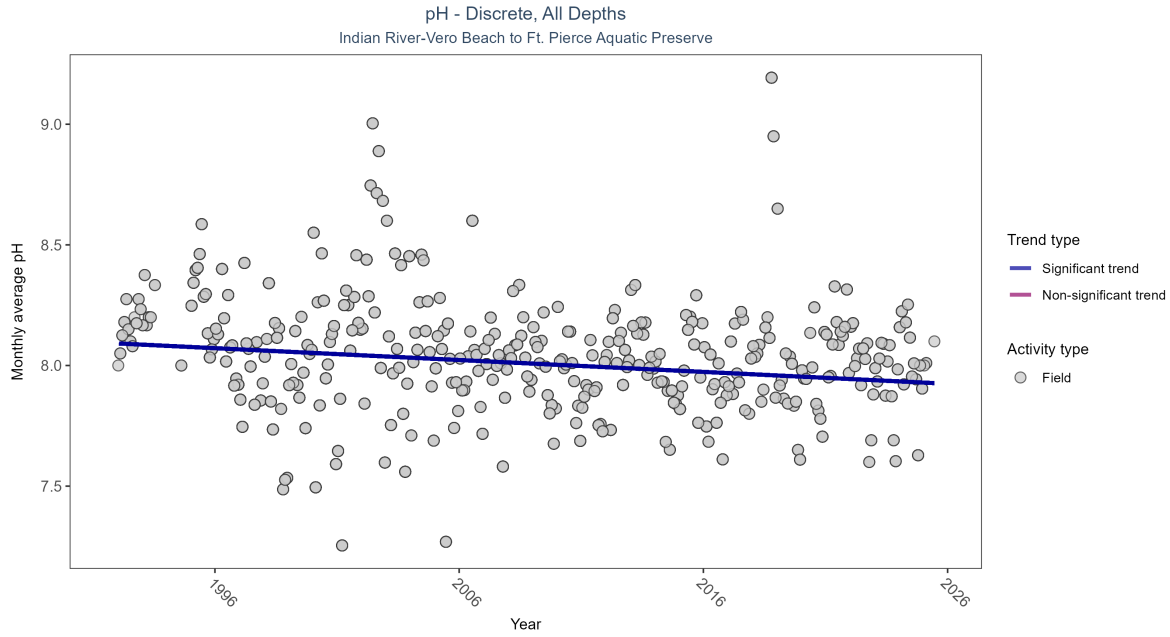


Figure 13: Scatter plot of monthly average pH over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Only pH values measured in the field (circles) are included in the plot.

Table 7: 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	6055	34	1992 - 2025	8.02	-0.14822	8.09146	-0.00492	1e-04

Monthly average pH decreased by less than 0.01 pH units per year.

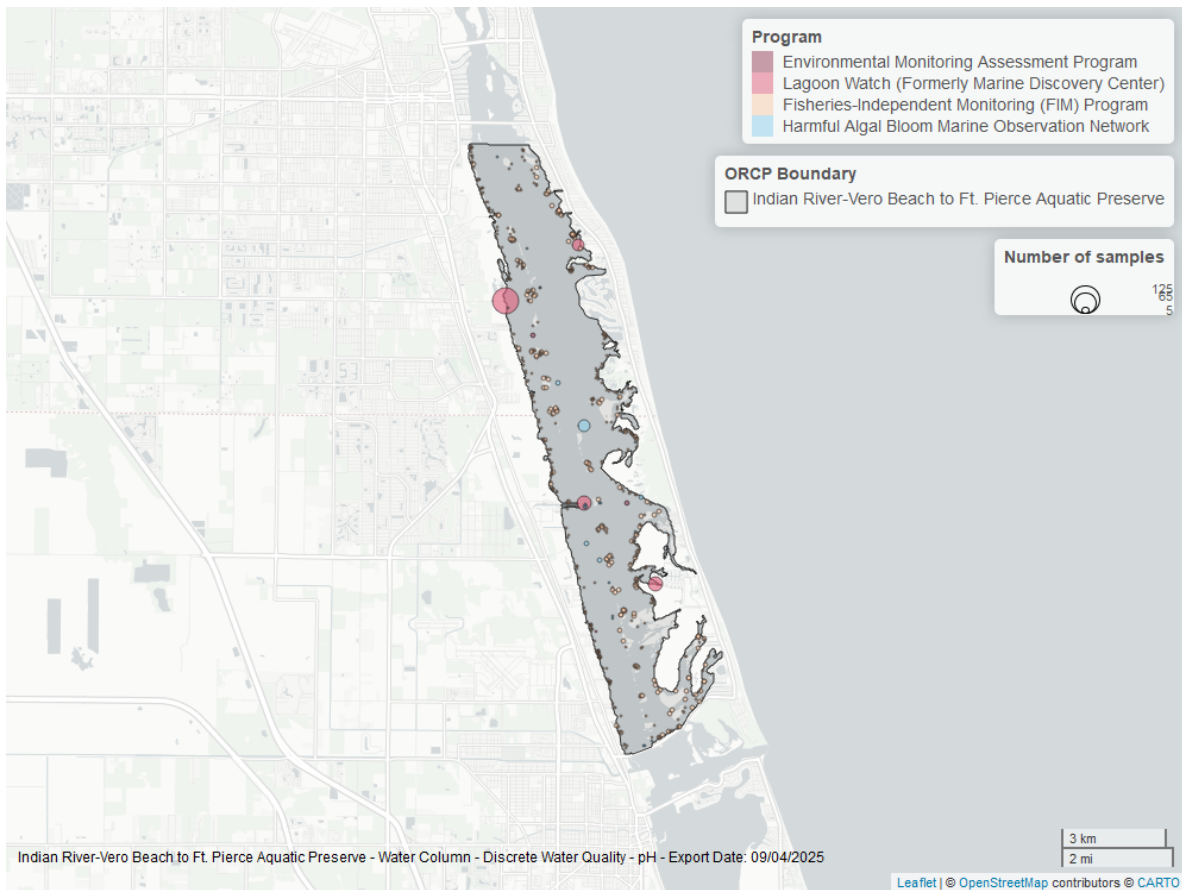


Figure 14: Map showing location of discrete water quality sampling locations within the boundaries of *Indian River-Vero Beach to Ft. Pierce Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Water Clarity

Turbidity - Discrete

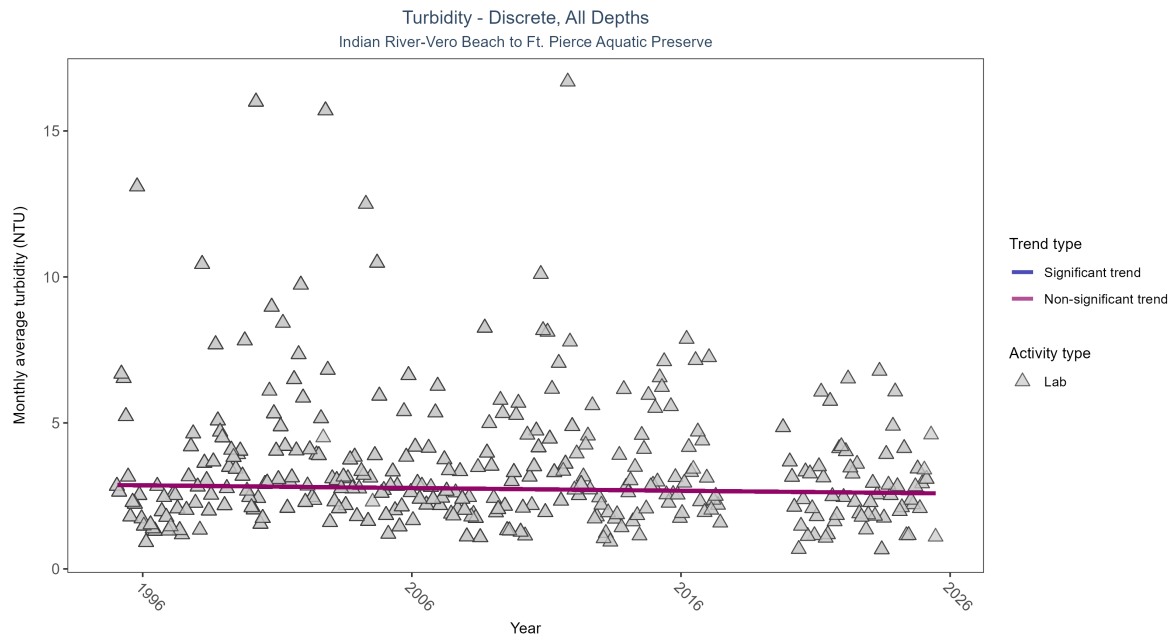


Figure 15: Scatter plot of monthly average turbidity over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Only turbidity values measured in the laboratory (triangles) are included in the plot.

Table 8: 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	3980	30	1995 - 2025	2.6	-0.0387	2.87211	-0.00931	0.3689

Turbidity showed no detectable trend between 1995 and 2025.

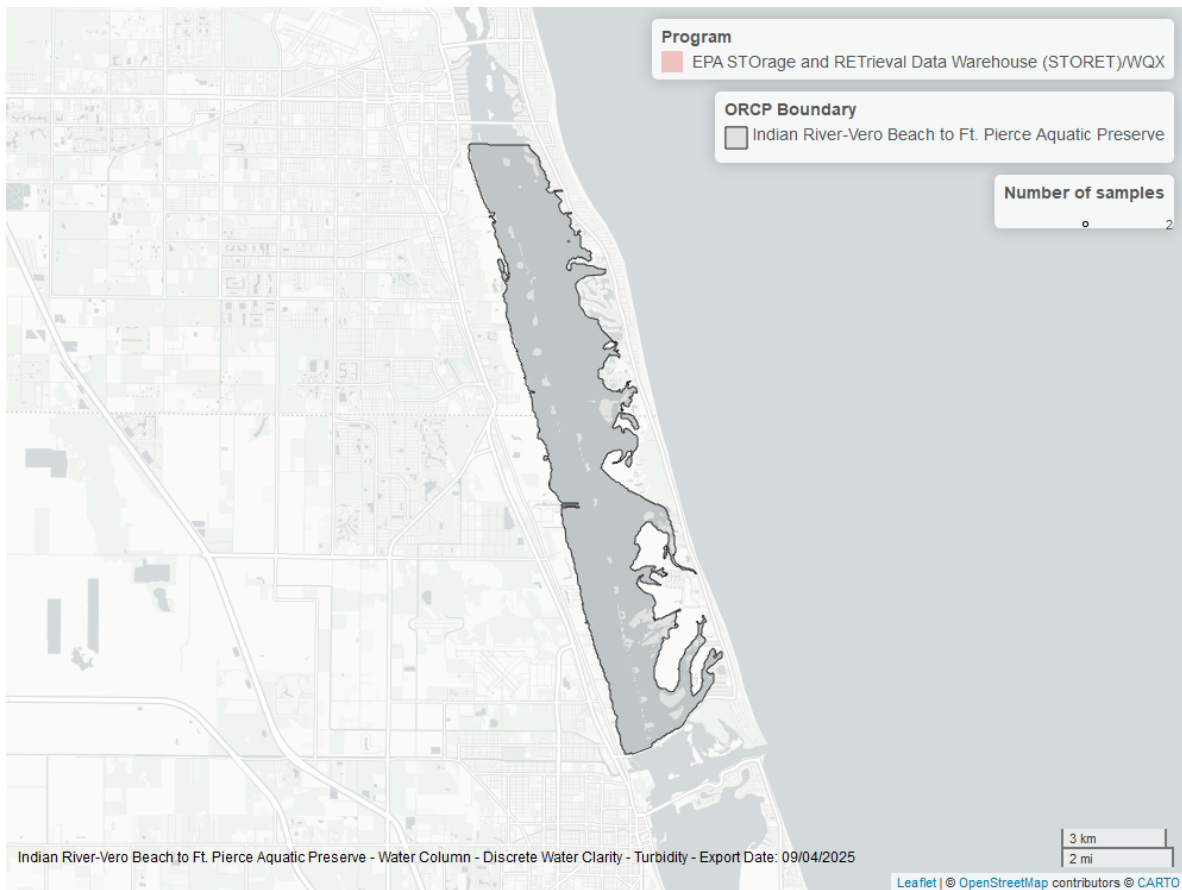


Figure 16: Map showing location of discrete water quality sampling locations within the boundaries of *Indian River-Vero Beach to Ft. Pierce Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Total Suspended Solids - Discrete

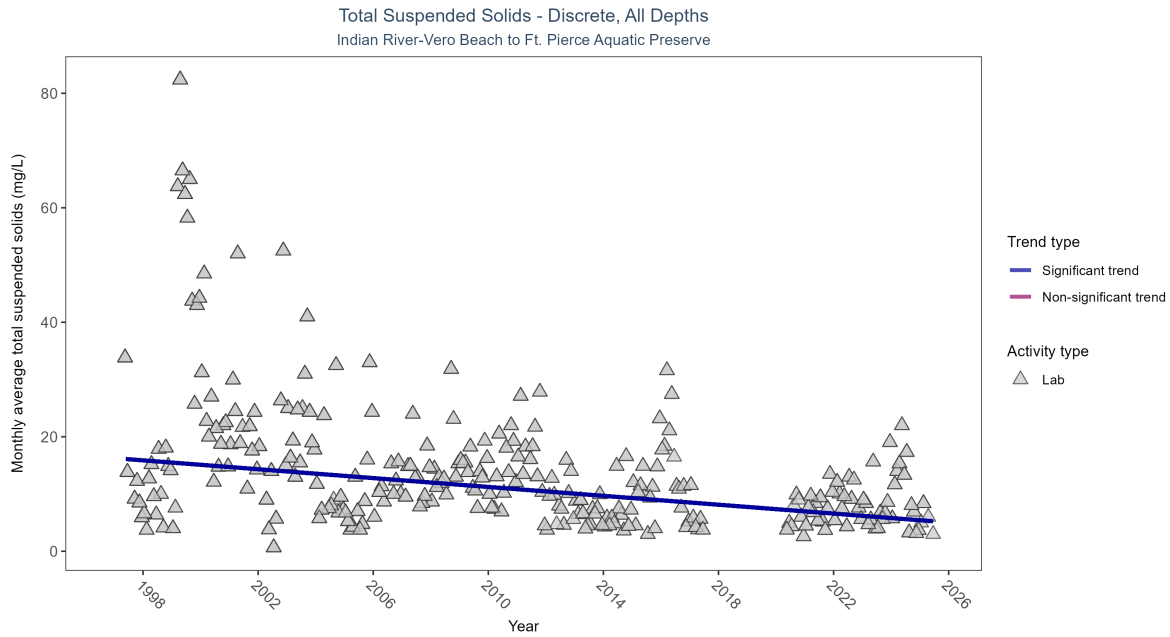


Figure 17: Scatter plot of monthly average total suspended solids (TSS) over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Only TSS values obtained from laboratory analyses (triangles) are included in the plot.

Table 9: 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 decreasing trend	912	27	1997 - 2025	12	-0.3049	16.26831	-0.3875	0

Monthly average total suspended solids decreased by 0.39 mg/L per year, indicating an increase in water clarity.

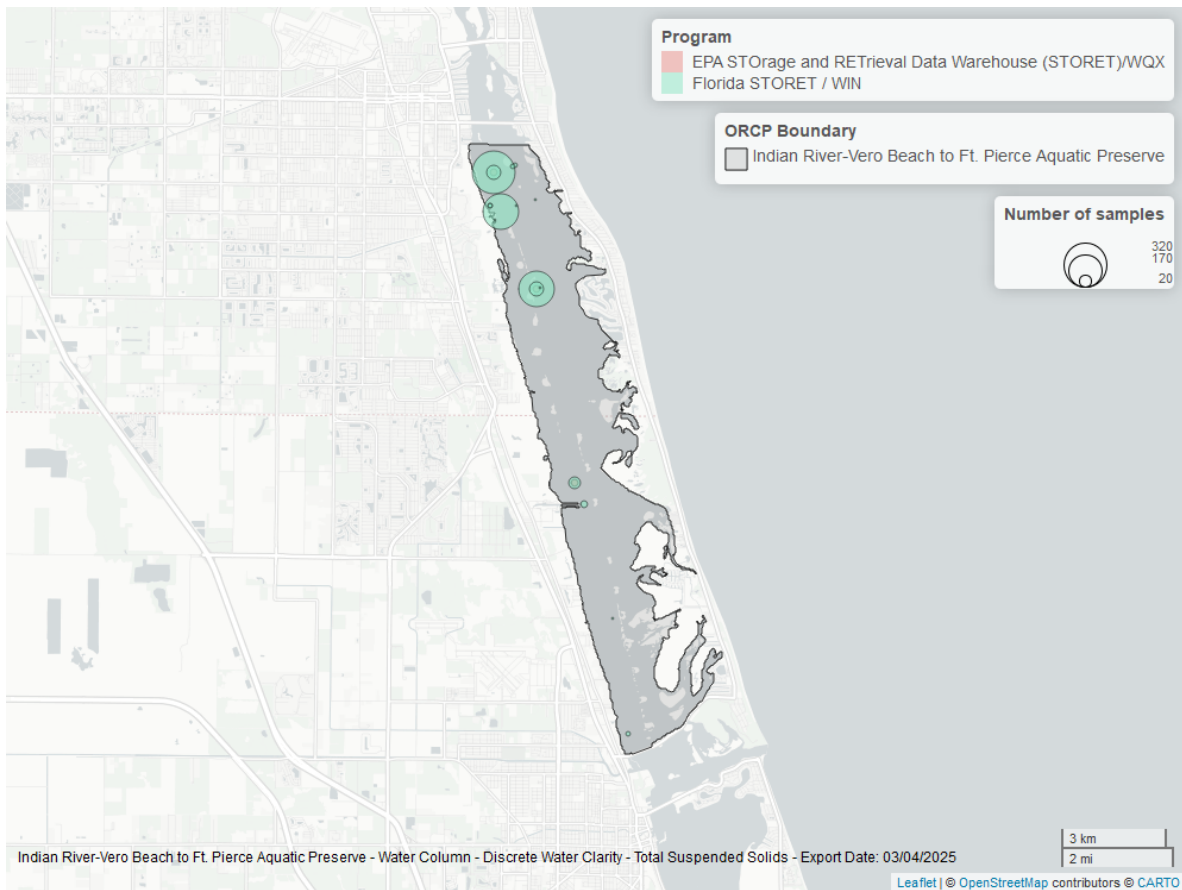


Figure 18: Map showing location of discrete water quality sampling locations within the boundaries of *Indian River-Vero Beach to Ft. Pierce Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Chlorophyll a, Uncorrected for Pheophytin - Discrete

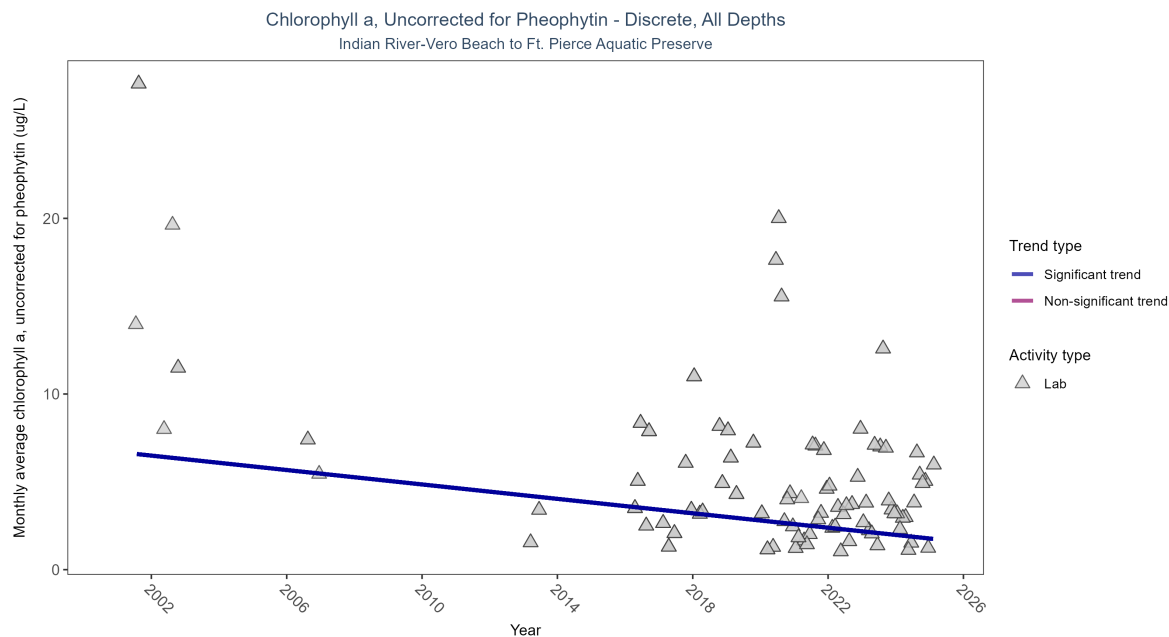


Figure 19: Scatter plot of monthly average levels of chlorophyll a, uncorrected for pheophytin, over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Only laboratory-analyzed chlorophyll a (triangles) is included in the plot.

Table 10: 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 decreasing trend	210	14	2001 - 2025	3.74723	-0.2737	6.69834	-0.20523	0.0016

Monthly average chlorophyll a, uncorrected for pheophytin, decreased by 0.21 µg/L per year, indicating an increase in water clarity.

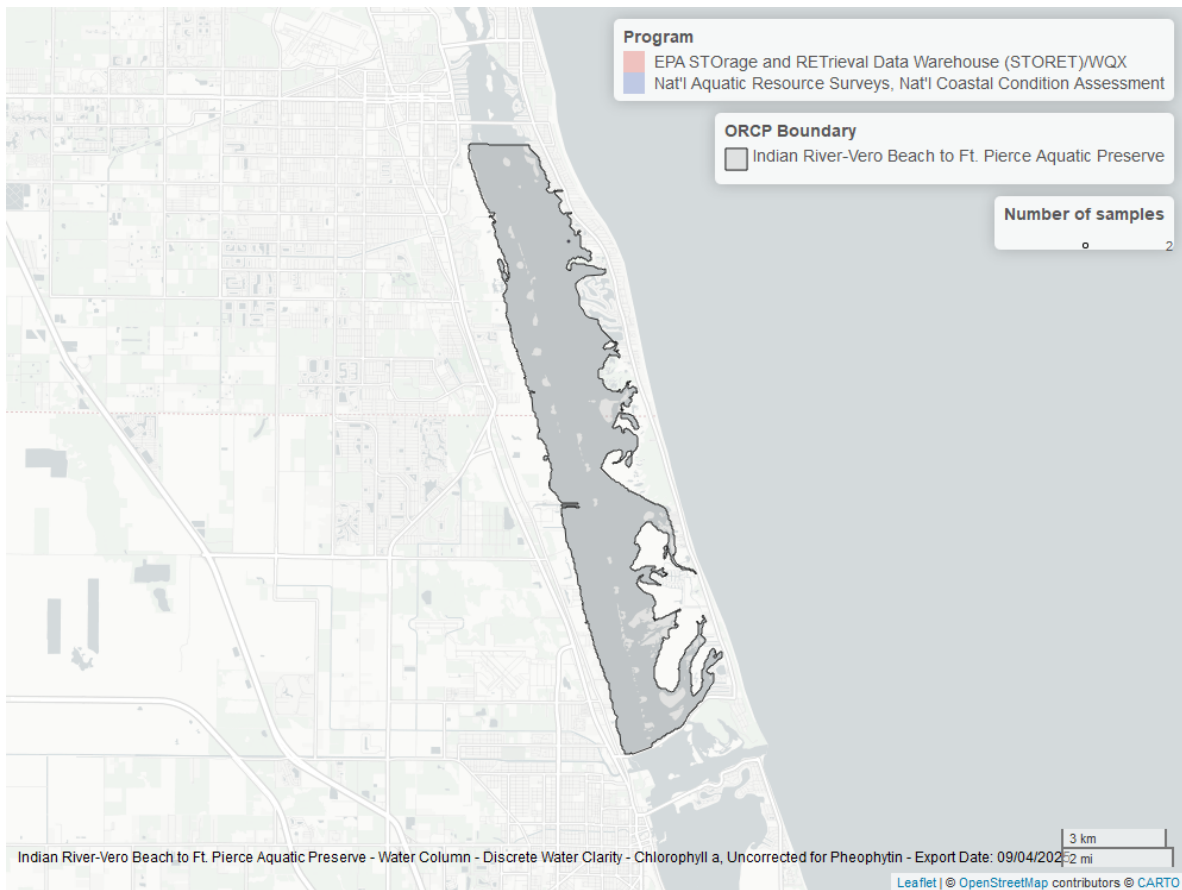


Figure 20: Map showing location of discrete water quality sampling locations within the boundaries of *Indian River-Vero Beach to Ft. Pierce Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Chlorophyll a, Corrected for Pheophytin - Discrete

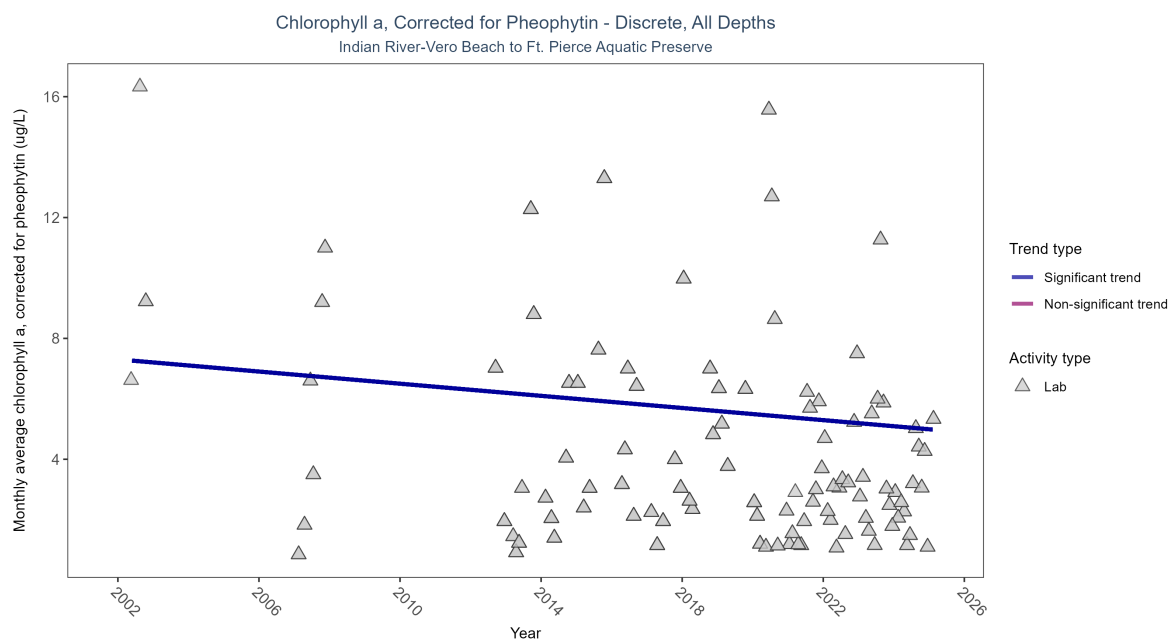


Figure 21: Scatter plot of monthly average levels of chlorophyll a, corrected for pheophytin, over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Only laboratory-analyzed chlorophyll a (triangles) is included in the plot.

Table 11: 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 decreasing trend	279	16	2002 - 2025	3	-0.22039	7.30492	-0.10052	0.0118

Monthly average chlorophyll a, corrected for pheophytin, decreased by 0.1 $\mu\text{g/L}$ per year, indicating an increase in water clarity.

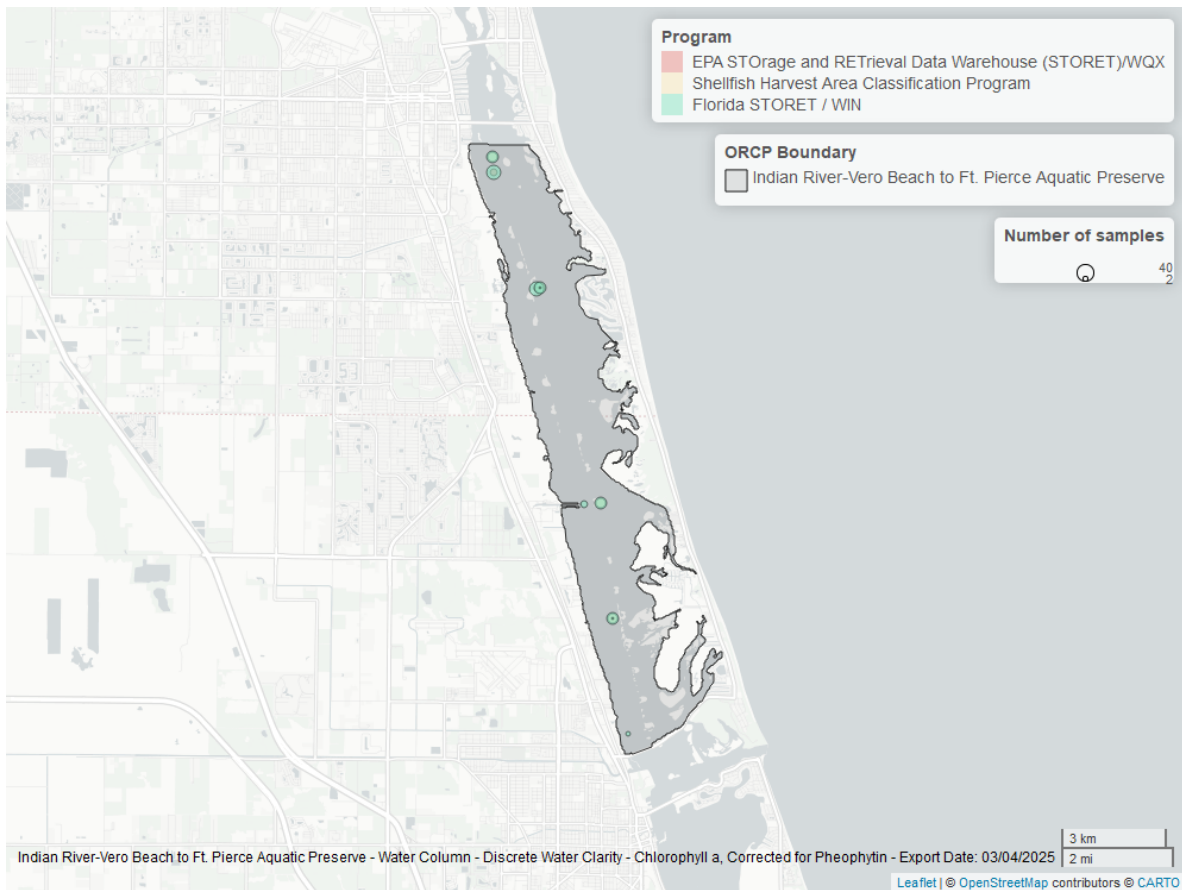


Figure 22: Map showing location of discrete water quality sampling locations within the boundaries of *Indian River-Vero Beach to Ft. Pierce Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Secchi Depth - Discrete

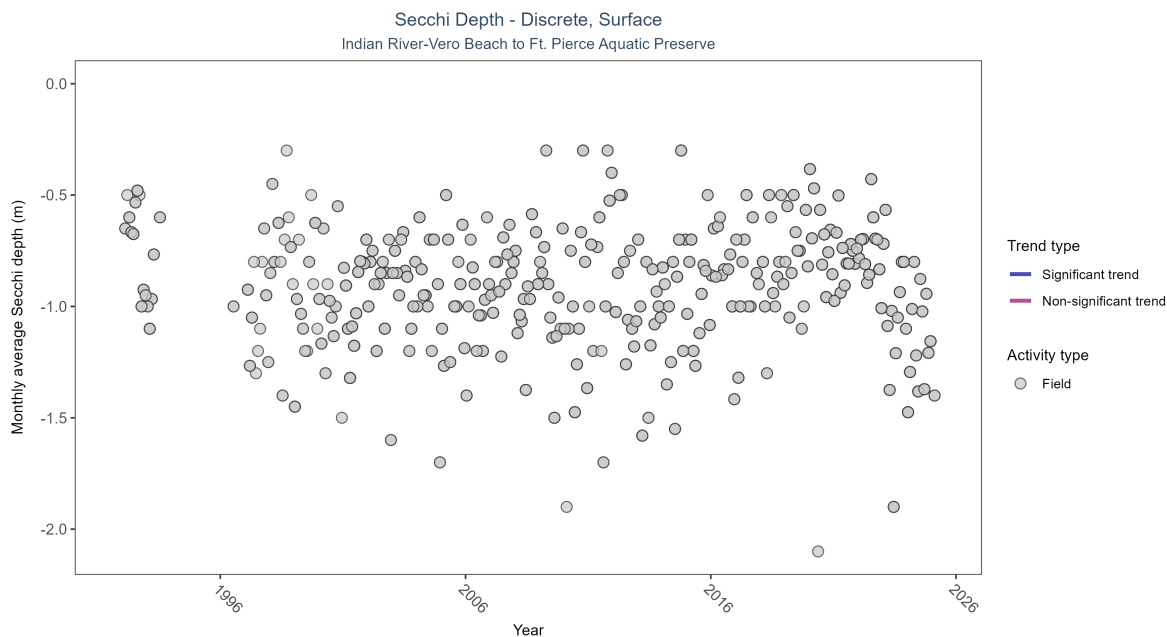


Figure 23: Scatter plot of monthly average Secchi depth over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Secchi depth is only measured in the field (circles).

Table 12: 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	2275	32	1992 - 2025	-0.9	-0.00808	-0.91637	0	0.8205

Secchi depth showed no detectable trend between 1992 and 2025.

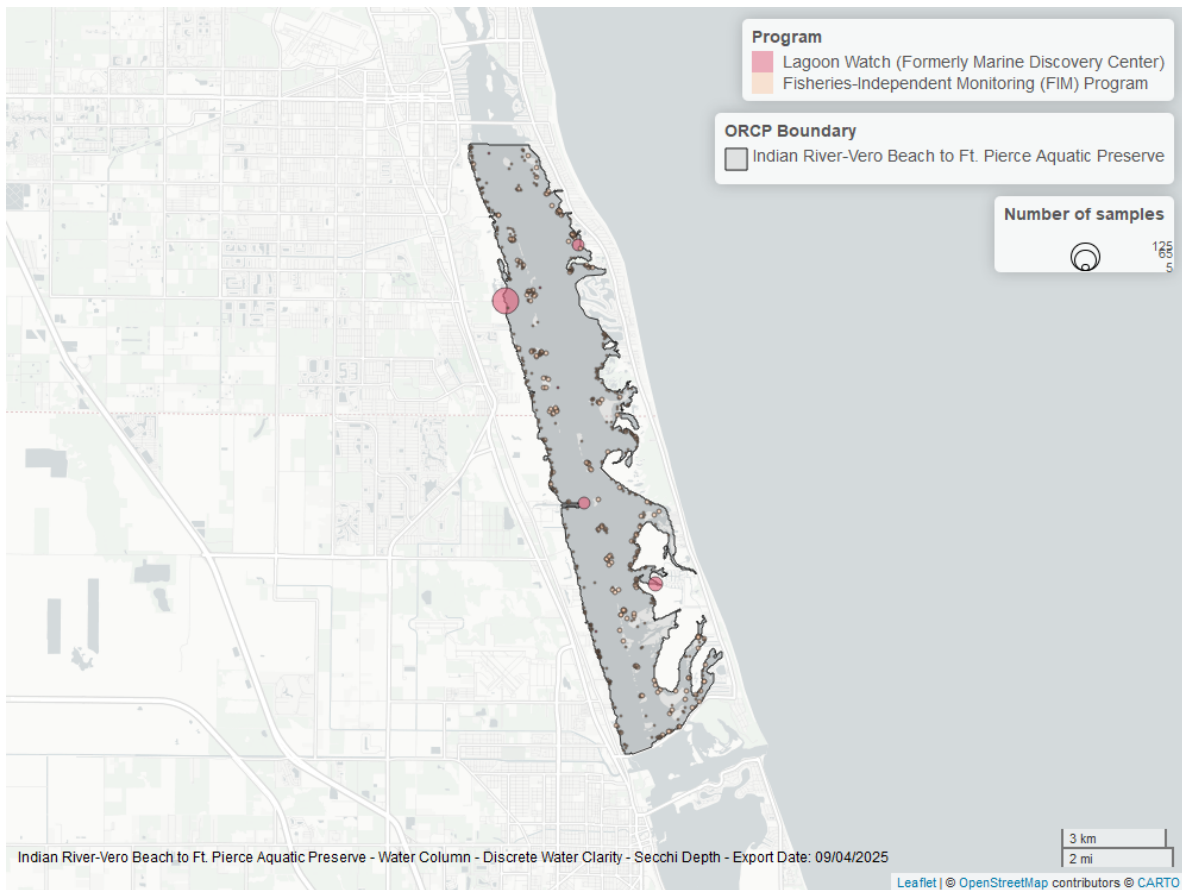


Figure 24: Map showing location of discrete water quality sampling locations within the boundaries of *Indian River-Vero Beach to Ft. Pierce Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Colored Dissolved Organic Matter - Discrete

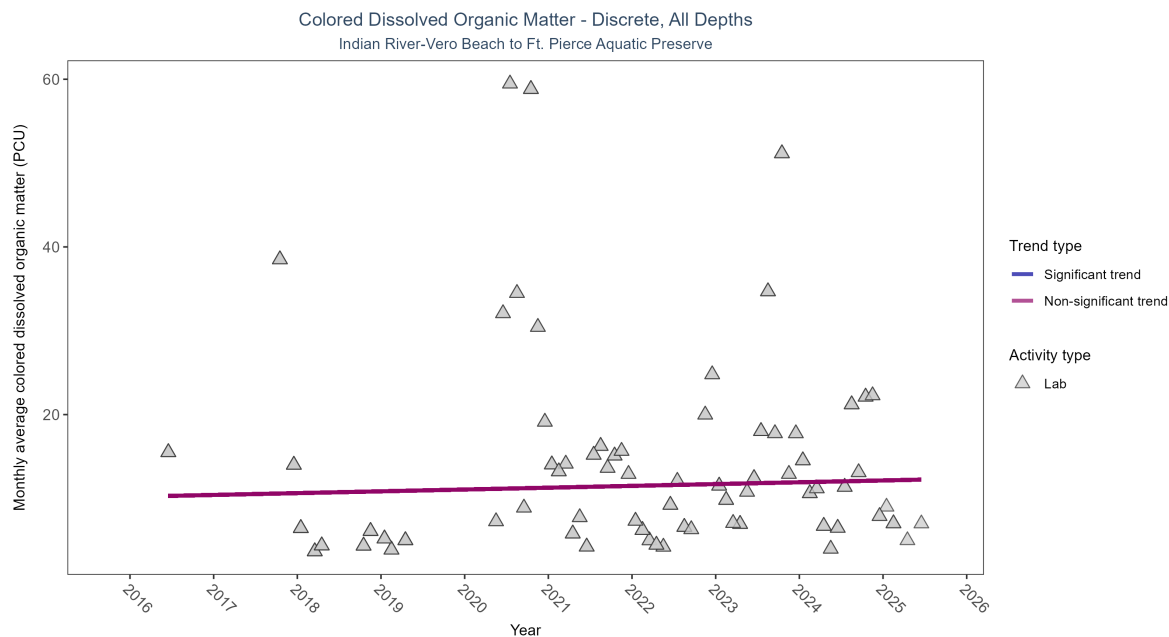


Figure 25: Scatter plot of monthly average colored dissolved organic matter (CDOM) over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Only laboratory-analyzed CDOM (triangles) is included in the plot.

Table 13: 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	187	10	2016 - 2025	10.52351	0.05619	10.19825	0.216	0.544

Colored dissolved organic matter showed no detectable trend between 2016 and 2025.

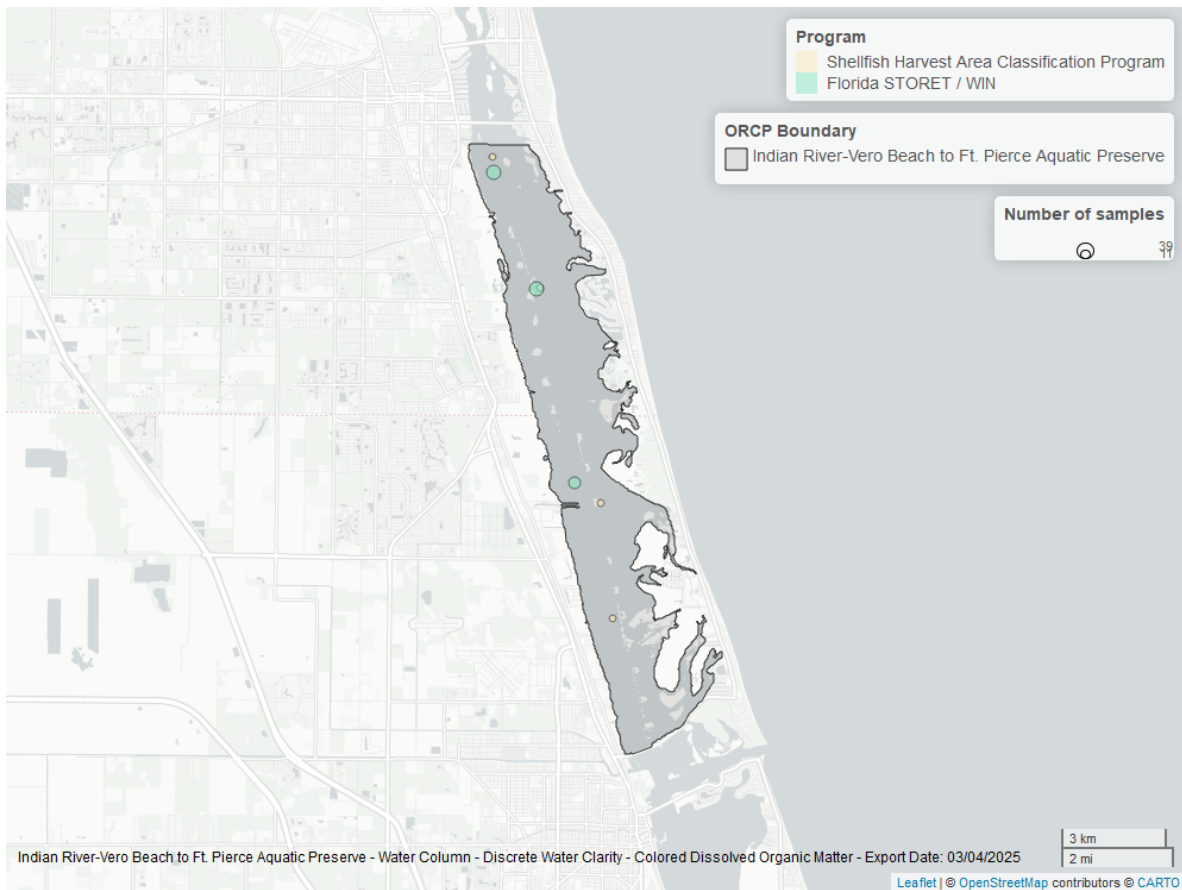


Figure 26: Map showing location of discrete water quality sampling locations within the boundaries of *Indian River-Vero Beach to Ft. Pierce Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.